

Vitamin D and Mood



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ND, LAc**

The World Health Organization predicts mood imbalance as the second most burdensome disease in the next decade with the greatest burden in North America and the United Kingdom. Currently, it accounts for 33.3% of patients in the United States and, at 160 million prescriptions annually, anti-depressants are the most prescribed medication, despite the fact that recent meta-analyses show these as no better to treat mild to moderate depression (the major prescriptive reason) than placebo. This group of conditions has multi-factorial causes and requires looking into emotional and spiritual issues, diet, and lifestyle factors, as well as choosing appropriate supplemental support for individualized care.

Vitamin D may help the integrative practitioner treat a critical underlying deficiency. Known best in calcium regulation, Vitamin D is gaining attention for playing a role in maintaining the health of a number of physiological functions and organ systems, being important in balanced immunity and healthy immunological function, healthy cardiovascular function, normal cell cycle control, and healthy inflammatory processes. A recent meta-analysis even suggests reductions in all-cause-mortality with Vitamin D supplementation.

Low levels of Vitamin D could be involved in the maintenance of a healthy mood in several ways. In human beings, the distribution of the Vitamin D receptor seems to occur in high concentration in the hypothalamus, suggesting a role in neuroendocrine function. Moreover, the distribution of target neurons of Vitamin D suggests an influence on levels of nerve growth factor, acetylcholine, serotonin, testosterone, thyroid hormone, and tyrosine hydroxylase messenger RNA. All these have all been implicated in the physiological aspects of mood.

So far, human clinical studies seem to bear out a role of Vitamin D in healthy mood regulation. In the largest Vitamin D study of 1282 older adults, mean levels of 25-hydroxyvitamin D were 14% lower in those with minor and major depression compared with controls. In another small study, 44 healthy participants were randomly assigned to 5 days of treatment with 400 or 800 IU of Vitamin D₃ or placebo

during winter months. Compared with placebo, both doses of the vitamin increased positive affect and decreased negative affect. A Norwegian study of 441 overweight people measured serum 25-hydroxyvitamin D levels. Those below 16 ng/mL were shown to be more depressed. These subjects were then given 20,000 IU, 40,000 IU, or placebo once a week. Those given 40,000 IU had a 33% reduction in depression scores, those given 20,000 IU had a 20% reduction, and the placebo group had a 5% decrease. Animal studies suggest that prevention of depression in the adult may even occur by treating pregnant moms, as gestational deficiency seemed to cause depression-like behavior in offspring.

Selected populations may be especially prone to low Vitamin D. These include the elderly who have an increased incidence of low Vitamin D, and patients with seasonal affective disorder who do not respond to light therapy.

Vitamin D Dosage

Since Vitamin D is fat soluble, it is advisable to run lab tests before recommending this vitamin. The test indicative of true Vitamin D status is 25-hydroxy (-OH) Vitamin D, which tests for the intermediate metabolite. Research demonstrates that dosages of 4,000 IU qd in depressed patients tend to improve well-being. This may be a good place to start for patients who desire to maintain a healthy mood. My clinical experience suggests that dosages of 6,000 to 8,000 IU qd may be necessary for four months to raise serum levels, followed by a maintenance dose 1,000 to 2,000 IU qd. Weekly doses of 50,000 IU intramuscular have been used clinically, although no long-term studies have been done with these to date. Studies of patients given long-term average of 14,000 IU qd orally showed no toxicity. As a fat soluble vitamin, oral doses should be taken with foods containing fats for best absorption. Although the normal range is usually between 30 and 70 ng/mL, many clinicians regard the optimal levels to be at least 50 ng/mL.

Vitamin D Toxicity

The exact amount of Vitamin D required to induce hypervitaminosis over a given period of time is unknown although some research recommends cautions at 20,000 IU qd or levels of 100 ng/mL. Recent meta-analyses suggests that at ordinary doses (400 to 800 IU qd), long-term Vitamin D supplementation does not seem to be associated with an overall adverse effect. Vitamin D toxicity may lead to hypercalcemia, kidney issues, and excess bone loss.

Vitamin D Forms and Natural Food Sources

When Exposed to UVB rays from sunlight, plants manufacture Vitamin D₂ (ergocalciferol), whereas Vitamin D₃ (cholecalciferol) is synthesized by humans in the skin when it is exposed to UVB rays from sunlight. There is contrasting information on whether Vitamin D₂ or D₃ is most effective. Pharmacopoeias have regarded these 2 forms as equivalent and interchangeable based on 1930's studies infant ricket prevention. Using the lab test 25-hydroxyvitamin D the form of D₃ has been revealed to be the more potent form of Vitamin D in all primate species, including humans. An emerging body of evidence suggests D₃'s greater ability to raise serum levels, diminished binding of Vitamin D₂ metabolites to Vitamin D binding protein in plasma, and a shorter shelf life of Vitamin D₂. Nevertheless, the form of Vitamin D used in major preparations of prescriptions in North America still persists as D₂. Given this information, D₃ should be regarded as the form to use in clinical practice.

Sources of Vitamin D

Food sources include oily fish, eggs, and butter. The main dietary source of Vitamin D is fish. The inverse correlation between fish consumption and depression has usually been interpreted as an association between omega-3 unsaturated fats and depression. However, if this association does reflect cause and effect, Vitamin D is also a factor to consider. Patients should assure adequate amounts of sunlight to increase levels of Vitamin D. One report specifies about 12 min/day in the sun is equivalent to oral intake of 3000 IU of Vitamin D₃. Patients with low serum levels, as well those at higher risk for melanoma and other skin cancers should be more cautious and should consider foods and a Vitamin D₃ supplement as a first option.

References available upon request

Peter Bongiorno ND, LAc is a graduate of Bastyr University, where he attained his naturopathic doctorate and acupuncture masters degrees. Before medical school, he was a pre-doctoral fellow at the National Institutes of Health and Yale University, in the field of clinical neuro-endocrinology. Peter is co-medical director of InnerSource Health in New York City and Long Island, and acts as Vice President of the New York Association of Naturopathic Physicians. Peter is a major contributor to the third edition of the Textbook of Natural Medicine and has recently authored the textbook Natural and Conventional Therapies for Depression which is to be published in June of 2010. He can be reached through www.InnerSourceHealth.com



D₃ 1,000 IU Chewable Lozenges



The major biologic function of Vitamin D is to maintain healthy blood levels of calcium and phosphorus. Vitamin D supports bone health by promoting calcium absorption and bone mineralization.* Vitamin D also plays an important role in healthy immune function, and helps to regulate cell growth and differentiation.*

Code **Size**
P0357 1000 IU 180 Loz

We also have D3 in 2,000, 5,000 & 10,000 potencies available

Supplement Facts		
Serving Size 1 Chewable Tablet		
	Amount Per Serving	% Daily Value
Vitamin D ₃ (as Cholecalciferol) (from Lanolin)	1,000 IU	250%

Other ingredients: Xylitol, Sorbitol, Cellulose, Natural Fruit Flavors (fruit punch, strawberry, raspberry), Beet Powder, Stearic Acid (vegetable source), Ascorbyl Palmitate, Citric Acid and Silica.

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L-Tryptophan

L-Tryptophan is an essential amino acid important in human nutrition for the synthesis of melatonin and serotonin, hormones regulating mood and stress response.* L-Tryptophan helps support relaxation, sleep, disposition and immune function.* Our L-Tryptophan is pharmaceutically pure — every lot is screened against Peak E and microbial contamination. L-Tryptophan is an amino acid that is critical for neurotransmitter synthesis. It is necessary for the production of serotonin (a neurotransmitter), melatonin (a neurohormone), and niacin (Vitamin B₃). For humans, L-Tryptophan is an essential amino acid, meaning it cannot be made by the organism and therefore must be part of its diet. These important amino acids are building blocks in protein biosynthesis.*

Code **Size**
P0166 500 mg 60 Vcaps®
P0167 500 mg 120 Vcaps®
P0169 1000 mg 60 Tabs

Supplement Facts		
Serving Size 1 Tablet		
	Amount Per Serving	% Daily Value
L-Tryptophan (Free-Form)	1.0 g (1,000 mg)*	

* Daily Value not established.

Other ingredients: Cellulose, Stearic Acid (vegetable source), Croscarmellose Sodium, Magnesium Stearate (vegetable source), Silica and Vegetable Coating.

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SAMe 200 mg Enteric Coated

SAMe (S-adenosylmethionine), a compound native to the body, is a critical component of many biochemical reactions, including those that affect brain biochemistry and joint health. Numerous studies have indicated that SAMe can help to temporarily alleviate aches and pains resulting from overexertion or stress. In addition, because SAMe is also necessary for the synthesis of neurotransmitters, it plays an important role in the maintenance of a positive mood. Our SAMe is enteric coated, which makes it very well tolerated and protects it from degradation.*

Code **Size**
P0138 200 mg 60 Tablets

Supplement Facts		
Serving Size 1 Tablet		
	Amount Per Serving	% Daily Value
Vitamin B-6 (from Pyridoxine HCl)	2 mg	100%
Folic Acid	200 mcg	50%
Vitamin B-12 (as Cyanocobalamin)	50 mcg	833%
SAMe (S-Adenosyl-L-Methionine)	200 mg	↑
<small>(from 400 mg of S-Adenosyl-L-Methionine Disulfate Tosylate)</small>		

* Daily Value not established.

Other ingredients: Cellulose, Croscarmellose Sodium, Methacrylic Acid, Magnesium Stearate (vegetable source), Silica, Triethyl Citrate, Stearic Acid (vegetable source), Citric Acid and Ascorbic Acid.

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Code	Products	Size
P0105	5-HTP 100 mg	90 Vcaps®
P0108	5-HTP 200 mg + Glycine, Taurine and Inositol	60 Vcaps®
P1811	A - Biotic™ Enteric Coated, Potent	60 Gels
P0076	Acetyl-L-Carnitine 500	100 Vcaps®
P3344	Adrenal Cortisol Support™	90 Vcaps®
P3032	AHCC® 500 mg	60 Vcaps®
P3282	Aller-All™ Seasonal Support	60 Tabs
P3036	Aloe Vera 5,000	100 Gel
P3042	Alpha Lipoic Acid 250 mg	90 Vcaps®
P3046	Alpha Lipoic Acid 600 mg Plus	60 Vcaps®
P0030	L-Arginine 500 mg	180 Caps
P2958	BioCore® Enhanced Enzymes	90 Vcaps®
P0471	Biotin 5000 mcg	90 Vcaps®
P1228	Bone Strength™	180 Caps
P1720	Borage/GLA 1050 mg	60 Gels
P3303	Brain Regain™	60 Vcaps®
P3063	Brocco Immune™	60 Vcaps®
P2943	Bromelain 2400 gdu/500 mg	90 Vcaps®
P3308	C.Away™	90 Vcaps®
P1268	Cal-Mag, Liquid, Lemon	16 oz
P1675	CardioTri-Plex™	120 Gels
P0072	L-Carnitine 500 mg Carnipure®	60 Caps
P3019	Celadrin® Joint Liposome Lotion	4 oz
P9470	Celadrin® Tabletop Display	12 Bottles
P1415	ChromeMate® 200 mcg	90 Caps
P1731	CLA Away™	90 Gels
P0405	CoEnzyme B Complex	60 Tabs
P3163	CoQ10 60 mg + Fish Oils	90 Gels
P3208	CoQ10 100 mg Softgels	90 Gels
P3196	CoQ10 200 mg Lozenges	60 Loz
P3198	CoQ10 400 mg Softgels	60 Gels
P3182	CoQ10 600 mg Softgels	60 Gels
P3186	CoQ10 Liquid 100 mg/tsp	4 oz
P4638	Curcumin 665 mg 95% Extract	60 Vcaps®
P3121	D-Flame™ Cox-2 Formula	90 Vcaps®
P2956	Dairy Digestion™	90 Vcaps®
P4704	EGCg 400 mg/50%	90 Vcaps®
P2963	Enzymes-HCl™	120 Caps
P5993	Fiber O-3™	16 oz
P1770	Flax Seed Oil 1000 mg Organic	120 Gels
P0498	Flush Free Niacin 500 mg	90 Vcaps®
P4683	Ginkgo Biloba 120 mg/24% Plus	100 Vcaps®
P3318	Glucose Balance™	90 Caps
P3170	Gluc/Chond/MSM Caps	90 Caps
P3172	Gluc/Chond/MSM Caps	180 Caps
P3243	Gluc/Chond 2 per day, Extra Strength	120 Tab
P3130	Gluc & MSM, Vegetarian 1000 mg	120 Vcaps®
P3175	Liquid Glucosamine, Chond, MSM	16 oz
P0094	L-Glutamine 1000 mg	120 Caps
P3274	Grape Seed OPC 250 mg Extract	90 Vcaps®
P3055	Immune Renew™ (Org. Mushrooms)	90 Vcaps®
P3134	Joint-UC™ Collagen	60 Vcaps®
P1625	Krill Oil, Neptune (NKO®) 500 mg	60 Gels
P2448	Liver Detox™	90 Caps
P3062	LYC-O-MATO® 20 mg Lycopene	60 Gels
P2811	D-Mannose Urinary 500 mg	90 Caps
P3258	Melatonin 3 mg Lozenge & B-6	120 Loz
P3326	MetaboEnergetics™	90 Caps
P0495	Methyl B-12 1,000 mcg	100 Loz
P0496	Methyl B-12 5,000 mcg	60 Loz
P4739	Milk Thistle 300 mg/80% Plus	90 Vcaps®
P2120	MSM 1,000 mg	180 Caps
P0085	NAC N-acetyl cysteine 600 mg + Antioxidants	100 Caps
P3140	Nattokinase 100 mg/2000 FU units	60 Vcaps®
P0453	Nutri-Dose™ B-12 10,000 mcg NEW!	12: 15 mL

P3301	Ocu Support™ Clinical Strength	90 Caps
P1659	Omega-3 Lemon Liquid /Molec Distilled	7 oz
P1656	Omega-3/Enter 180/120 /Molec Distilled	90 Gels
P1657	Omega-3/Enter 180/120 /Molec Distilled	180 Gels
P1661	Ultra Omega-3 500/250/Molec Distilled	90 Gels
P1662	Ultra Omega-3 500/250/Molec Distilled	180 Gels
P3281	Ortho Detox™	90 Caps
P2912	Ortho Dophilus™ 8 Strains, 4 Billion	60 Vcaps®
P0950	Ortho-E™ NON-GMO	60 Gels
P3772	Ortho Liquid Multi™ - Iron Free/Xylitol	16 oz
P3788	Ortho Multi™ Greens	180 Vcaps®
P3878	Ortho Multi™ for Men Caps	90 Vcaps®
P3875	Ortho Multi™ for Men Tabs	90 Tabs
P3816	Ortho Multi™ Softgel w/ Flax 400 mg	90 Gels
P3798	Ortho Multi™ for Women Caps	120 Vcaps®
P3796	Ortho Multi™ for Women Tabs	90 Tabs
P3340	Ortho Prostate™	90 Gels
P3368	Ortho Thyroid™	90 Vcaps®
P1413	OsteoBoron® 3 mg, Natural Form/base	90 Vcaps®
P0487	Pantethine 300 mg Co-enzyme A	60 Gels
P4727	Peppermint Oil G.I.™ Enteric	90 Gels
P3345	PepZin G.I.® Soothe™	60 Tabs
P2385	Phosphatidyl Serine 100 mg & Ginkgo 60 mg	60 Gels
P3338	Progesterone Cream Pump - 20 mg	3 oz
P5955	ProtoClear™ Berry Flavor	2.3 lbs
P5956	ProtoClear™ Info Card & Sample - Berry	25 g
P5957	ProtoClear™ Orange Flavor	2.3 lbs
P5958	ProtoClear™ Info Card & Sample - Orange	25 g
P5960	ProtoClear™ Vanilla Flavor	2.3 lbs
P5961	ProtoClear™ Info Card & Sample - Vanilla	25 g
8931	ProtoClear™ Premium Shaker Cup	12 oz
P0716	ProtoSorb™ C 500	100 Vcaps®
P0726	ProtoSorb™ C 1000	100 Tabs
P2928	ProtoDophilus™ 50 Billion/Cap NEW!	50 Vcaps®
P3321	Red Yeast & CoQ10 30 mg, ALA	90 Vcaps®
P3500	Red Yeast Rice Extract 600	90 Vcaps®
P3353	Resveratrol 200 mg Extra Strength	60 Vcaps®
P2147	D-Ribose Powder, Bio Energy Pure	300 g
P0138	SAMe 200 mg Enteric + B Complex	60 Tabs
P4756	Saw Prostetto™ 320 mg/85-95% Extract	90 Gels
P1485	Selenium 200 mcg, Yeast-Free	90 Vcaps®
P2954	Serrazimes® 33 mg/20,000 units	90 Vcaps®
P1905	Slimaluma® Plus	60 Vcaps®
P6957	Stevia Complete Packets	100/box
P6955	Stevia Non-Bitter Liquid, Sweet	2 fl oz
P6960	Stevia Non-Bitter Powder, Sweet	1 oz
P3507	Sytrinol® Cholesterol Formula	60 Vcaps®
P0142	Taurine 1000 mg Caps	100 Caps
P3145	Ubiquinol CoQH-CF™ 50 mg	60 Gels
P3142	Ubiquinol 100 mg NEW!	60 Gels
P3380	True Balance™ Multi	120 Caps
P0166	L-Tryptophan 500 mg	60 Vcaps®
P0167	L-Tryptophan 500 mg	120 Vcaps®
P0169	L-Tryptophan 1000 mg	60 Tabs
P3123	Vein Integrity™ with Trunorin®	90 Vcaps®
P2168	Virility For Men with LJ100®	60 Vcaps®
P0452	Vitamin B-12 Liquid Tri-Formula 5,000 mcg	4 oz
P0690	Vitamin C-1000 Cap+100 Bioflavonoids	120 Caps
P0357	Vitamin D-3 1,000 IU Chewable NEW!	180 Loz
P0365	Vitamin D-3 1,000 IU	120 Gels
P0367	Vitamin D-3 2,000 IU	120 Gels
P0372	Vitamin D-3 5000 IU	120 Gels
P0370	Vitamin D-3, Liquid 5000 IU	2 oz
P0374	Vitamin D-3 10,000 IU NEW!	90 Vcaps®
P0906	Vitamin E-400 20% Mixed + Selenium	120 Gels
P1554	Zinc Glycinate, 30 mg Softgels NEW!	120 Gels

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- * *Higher Bioavailability*
- * *Active Antioxidant Form of CoQ10*

Code Size
P3142 60 Gels

Supplement Facts

Serving Size 2 Softgels Servings Per Container 30

Amount Per Serving

Ubiquinol (Kaneka QH®) (Reduced Form CoQ10) 200 mg*

* Daily Value not established.

Other ingredients: MCT Oil (medium chain triglycerides), Softgel Capsule (gelatin, glycerin, water, carob) and Beeswax.

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