Standard Process
WHOLE FOOD NUTRIENT SOLUTIONS

Nutritional Support Protocol

Support for Healthy Serotonin Balance

Developed and reviewed by the clinical, chiropractic, and naturopathic members of the Standard Process team

Serotonin Physiology

Serotonin is a neurotransmitter that plays a key role in mood stabilization, cognitive function, sleep, pain perception, and gastrointestinal function. Serotonin is synthesized from the amino acid tryptophan through a series of enzymatic steps, primarily in the raphe nuclei of the brainstem and enterochromaffin cells of the gastrointestinal tract. Serotonin synthesis is dependent upon proper methylation and the presence of specific precursors and cofactors. Once synthesized, serotonin is stored in vesicles and released into the synaptic cleft to transmit signals between neurons. Over 90% of the body's serotonin is found in the gut where it supports sensation and intestinal movement.

Low serotonin levels can develop because of poor-quality sleep, substance use, psychological issues, environmental factors, and gastrointestinal disorders. Chronic stress increases the production of glucocorticoids in the adrenal glands, which depletes vital cofactors for neurotransmitter production and function such as B vitamins and magnesium.

Nutrition and lifestyle interventions can support serotonin production by providing sufficient levels of precursors and cofactors, by promoting healthy gut function, and via activities known to support healthy serotonin levels.

Supportive Lifestyle Practices

Moderate levels of physical activity and short bouts of intense exercise induce neurochemical changes that increase the production of serotonin. Motor activity increases the firing rate of serotonin neurons and increases tryptophan levels in the brain that persist after exercise.[1]

Recommend regular sun exposure to promote healthy serotonin levels. Skin is thought to play a role in the production and bioregulation of serotonin, and light exposure appears to increase serotonin levels.[2] Vitamin D supports serotonin synthesis and regulates serotonin transporters in the brain.[3]

Whole Foods Nutritional Recommendations

Recommend foods rich in Omega-3 fatty acids EPA and DHA like salmon, cod liver, tuna, and calamari. EPA and DHA are thought to modulate serotonin release from presynaptic neurons and influence serotonin receptor action by increasing cell membrane fluidity in postsynaptic neurons.[3]

Encourage consumption of magnesium-rich foods like leafy greens, nuts, and legumes. Magnesium acts as a cofactor for tryptophan hydroxylase and modulates serotonin receptor binding and transmission.[4]

Recommend consumption of foods rich in B_6 such as eggs, milk, banana, and chickpeas. B_6 influences serotonin production as a function of its role as a key cofactor in the tryptophan-serotonin pathway.[5]

Dietary Supplement Regimen

E-Z Mg™

Suggested Use: **6 tablets per day**

E-Z Mg™ is a plant-based, organic magnesium (Mg) supplement developed to support patients with inadequate dietary magnesium intake.*

- Essential for central nervous system health*
- Plant-based and considered ideal as a naturally occurring magnesium, as it consists of a collection of various magnesium forms
- Magnesium is involved in sleep pathways that support brain homeostatic sleep processes*

Cod Liver Oil

Suggested Use: **3 softgels per day**

- Cod Liver Oil contains the omega-3 fatty acid, DHA, which is important for normal brain structure*
- Supports healthy inflammatory processes*
- Excellent source of antioxidant vitamin A
- Good source of vitamin D

Nevaton® Forte

Suggested Use: **1 tablet 3-4 times daily**

Nevaton® Forte contains Skullcap, St John's Wort, Schisandra and Saffron to support healthy nervous system function including mood balance.*

These herbs have been traditionally used in herbal preparations to:

- Calm the nerves and restore balance in temporary mood swings*
- Support healthy nervous system response*
- Encourage balance between the body and mind*
- Ease the effects of occasional mild stress*
- Help promote healthy mood balance*
- Provide relief from occasional sleeplessness*

Niacinamide B_6

Suggested Use: **1 capsule per day**

- Supports a healthy nervous system*
- Contains two important constituents of coenzymes that are essential for metabolic processes*
- Excellent source of niacin and vitamin B_6

Assessment of Serotonin Balance

In Office/Physical Exam

- Signs/Symptoms such as fatigue, lethargy, mood changes, poor quality sleep, changes in appetite, loss of interest in activities, digestive issues
- Labs: Vitamin D 25 OH, thyroid panel, complete blood count (CBC), comprehensive metabolic panel (CMP)
- Patient Health Questionnaire (PHQ-9)
- Medical Hx: Mood disorder, cognitive issues, gut problems, seasonal affective disorder
- Omega-3 Index Plus Test

REFERENCES

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2. Sansone RA, Sansone LA. (2013) Innov Clin Neurosci. Jul;10(7-8):20-4.
3. Patrick, R. P., & Ames, B. N. (2015). FASEB journal 29(6), 2207–2222.
4. Cuciureanu MD, Vink R. (2011) In: Magnesium in the Central Nervous System. Vink R, Nechifor M, editors. Adelaide (AU): University of Adelaide Press.
5. Hvas, A. M., et al. (2004).Psychotherapy and psychosomatics, 73(6), 340–343.

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*These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.

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