

Sleep and emotional wellness: The supportive role of amino acids*

written by Celine Torres-Moon | February 25, 2024



Mood disorders abound these days, making them among the most common reasons people seek medical help. Drugs can help sometimes, but many are wary of their side effects. However, there are effective natural therapies to support optimal mood. Learn about their potential here in this great summary from our friends at Protocol for Life Balance.

—Dr. Ronald Hoffman

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Feeling stressed, tense, under the weather, or blue is a perfectly normal and healthy emotional reaction to environmental stressors. While these emotions are normal, they can take a toll on our overall well-being and sleep quality. Many of us wish to minimize their impact on our health. Supplementation with amino acids is a safe and affordable way to support optimal sleep quality and emotional wellness.* In this article, we will focus on recognized amino acids and amino acid combinations that support a healthy response to temporary environmental psychological stress and sleep quality: 5-hydroxy-tryptophan (5-HTP), L-tryptophan, gamma-aminobutyric acid (GABA), and theanine.* Each of these used alone or in combination can help you cope with temporary stressful situations and may support healthy sleep quality.*[‡]

Sleep and emotional wellness depend on healthy brain function, which relies on a complex network of cells and interconnected systems involving many neurotransmitters that act as messengers between these cells. Assuming the brain has access to the proper building blocks necessary for neurotransmitter production, it is typically very good at maintaining the right balance of different neurotransmitters to maintain healthy brain functions. Also, a proper balance of specific neurotransmitters such as dopamine and serotonin will contribute to mental health, including the support of healthy mood and

emotions.

Serotonin (5-hydroxytryptamine) is a neurotransmitter that is naturally produced and regulated in the brain. A cascade of biochemical reactions is needed to make serotonin from the essential amino acid L-tryptophan.* One of these reactions results in the production of 5-HTP, an amino acid that is indispensable for the ultimate endogenous production of serotonin.* In the central nervous system, serotonin is known to participate in many brain functions, including the regulation of sleep, mood, emotions, appetite, pain, and body temperature. Serotonin levels in the brain depend on levels of L-tryptophan and 5-HTP in the central nervous system.* 5-HTP is known to easily cross the blood-brain barrier, which is the natural brain-protecting gate against xenobiotics.*^z L-tryptophan, on the other hand, has only limited access to the brain due to the need for a transport system shared with other competing amino acids to go from the bloodstream to the central nervous system.

Supplementing the diet with 5-HTP and tryptophan contributes to maintaining healthy brain levels of serotonin, allowing the brain to have serotonin available to support healthy mood and other serotonin-related functions.* Clinical studies have demonstrated that supplementing the diet with 5-HTP and tryptophan can influence brain chemistry and contribute to the maintenance of healthy mood, emotions, and normal sleep patterns.*¹⁻⁴ Because 5-HTP and tryptophan reach the brain in different manners, it may offer more choice and flexibility for individuals seeking to supplement their diet with these compounds to strengthen their brain serotonin levels.* Consulting a trained professional to determine the best supplementation protocol is a good way to achieve the best results.

GABA is a non-protein amino acid that is also naturally produced in the brain. GABA is critical to the normal functioning of the central nervous system, where 60–75% of all synapses are GABAergic. GABA, as an inhibitory neurotransmitter, is involved in a wide range of human behaviors. These include apprehension and stress regulation, circadian rhythm and sleep regulation, memory enhancement, mood, and even pain perception. A low level of GABA or impaired GABA regulation is associated with some disruption of sleep quality and disruption of the ability to stay calm and cope with stress.

GABA as a dietary supplement has been extensively studied. In a recently published review of more than ten randomized, placebo-controlled clinical studies evaluating the effects of GABA supplementation on stress and sleep, the authors suggested that GABA may contribute to the body's ability to cope with stress by modulating the peripheral autonomic nervous system, notably the sympathetic nervous system, as well as regulating cortisol secretion.* While there is limited evidence that ingested GABA passes the blood-brain barrier, some of the studies evaluated in this literature review have shown that GABA supplementation has a physiological effect on the brain as illustrated by visible modifications of brain waves when measured by Electroencephalogram (EEG).* GABA supplementation resulted in brain wave activity that is consistent with a state of relaxation.* The authors pointed out that lower doses of GABA (less than 30 mg per day) seemed to affect the

autonomic nervous system while higher doses seemed to affect the central nervous system.* The same review examined the effect of GABA on sleep. These results were less conclusive; repeated GABA intake may improve early sleep parameters, and the dose to obtain this effect is in the 100 to 300 mg range.^{5*}

Another amino acid, theanine, which is found in tea, is known to be the constituent responsible for the calming properties of green tea.* Theanine crosses the blood-brain barrier and enhances healthy alpha brain-wave[†] activity, which is associated with a relaxed but alert state.* At the same time, theanine helps support the health of brain cells exposed to typical stimulation from excitatory neurotransmitters and promotes the release of GABA, which in turn regulates dopamine and serotonin levels in the brain.* Clinical studies have shown that theanine may support relaxation without drowsiness and promote healthy cognitive function.* For example, in a double-blind, placebo-controlled clinical trial with 16 healthy volunteers (average age 27 years old), a single administration of oral theanine (200 mg) resulted in a significantly more relaxed score of VAMS (Visual Analogue Mood Scale) as compared to both placebo and a treatment of reference ($p < 0.05$).^{6*} Furthermore, in a randomized, double-blind, placebo-controlled clinical trial involving 91 subjects with mild cognitive impairment (average age 57 years), supplementation with theanine (a combination of green tea extract + 480 L-theanine mg/day in two divided doses for 16 weeks) resulted in a significant improvement in Rey-Kim memory test, as compared to placebo ($p < 0.05$).^{7*}

The main goal of supplementing the diet with L-tryptophan, 5-HTP, GABA, and theanine is to provide the brain with the building blocks it needs to produce serotonin and to fine tune synapse function when the brain is subjected to stressors.* Furthermore, GABA works also outside the central nervous system, by modulating the response to stress by the peripheral autonomic nervous system and via the hypothalamic-pituitary-adrenal axis.* These amino acids help the brain self-regulate to ensure optimal synaptic function when the body is subjected to external stressors.* This brain self-regulation system contributes to positive mood and healthy emotional reactions when we are subjected to normal daily stressors.*

Protocol For Life Balance®, a brand of high-quality dietary supplements, offers several supplements that help nourish the brain.* Among them, L-Tryptophan is available as 500 mg vegetable capsules and 1,000 mg tablets, 5-HTP from *Griffonia simplicifolia* is offered as 100mg and 200mg capsules, GABA as 750 mg capsules, and L-Theanine as 200 mg capsules. Protocol For Life Balance® also has an extensive line of products useful for sleep, mood and temporary stress support such as Adrenal Cortisol Support™, Clinical Stress Relief, Magtein® and other forms of magnesium, Melatonin, Myo-Inositol, SAME, and Sceletium Extract as Zembrin®.*

References:

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[‡] Dietary supplements work even better when associated with other methods of relaxation such as aromatherapy, meditation, exercise, yoga, breathing techniques, and counseling. This article does not address the pathological side of psychological stress, anxiety, or insomnia requiring professional mental health support.

[‡] Xenobiotics are chemical substances found within an organ that are not expected to be present within the organ. It can also be a substance that is present in much higher concentration than expected. The blood-brain barrier is a virtual gate controlling the type of compounds allowed to reach the central nervous system; its role is to protect the brain and to allow it to remain in a consistent and stable environment.

[‡] Alpha brain-wave: When a group of neurons sends an electrical signal to another group of neurons, we call these brain waves. These brain waves can be recorded when doing an electroencephalogram (EEG) which is a test that detects and measures the electrical activity in your brain. There are several types of normal brain waves, the alpha type usually indicates that you are in a state of wakeful rest.

*** 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.**