

Healthy Nutrients for a Healthy Brain

By Jack Challem, *The Nutrition Reporter*TM

If you could look inside your brain, you'd find six trillion cells and a biological computer far more complex than anything ever created by Apple, Intel, or Microsoft. It grows, learns from experience, and adapts to new information.

There's one other fact about the brain that's pretty amazing: its structure and biochemistry depends on nutrition. After all, nutrients provide the biochemical building blocks of everything physical in the body.

The production of new brain cells, called neurogenesis, lies at the heart of brain development. Vitamins A, C, and E, and the B-vitamin folic acid are essential for neurogenesis, or for turning generic stem cells into full-fledged functioning neurons. Growing research suggests that vitamin D may also be important to the brain as well.

Low levels of these and other nutrients during infancy can set the stage for problems later in life, just like a lack of nurturing and social interaction. For example, deficiencies of folic acid and vitamin B12 during childhood increase the risk of poor learning and mood disorders later in life.

My Top Brain Supplements

Incredible as it might sound, 60 percent of the brain consists of fat or fat-containing compounds. Essential fatty acids (EFAs) and phospholipids are among the most important dietary sources of healthy brain fats. They are needed for developing brains, and are important for thinking, memory, and balanced moods in adulthood.

- *Essential Fatty Acids* - Two omega-3 fats, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), are required for the normal development of the brain, eyes, and nervous system. Arachidonic acid, an omega-6 fat that can be problematic in adulthood, is also needed for normal brain development in infancy.

EPA and DHA, abundant in fish oils, are incorporated into the walls of brain cells, where they increase the activity of genes involved in neurotransmitter activity and connections between brain cells.¹ Considerable research has found that EPA and DHA benefit a wide range of mood problems, poor memory, thinking processes, impulsiveness, hostility, and physical aggressiveness.^{2 3 4 5} *Consider 1-3 grams of omega-3 fish oils daily.*

- *Phospholipids* - The two principal dietary phospholipids are phosphatidylserine (combining a phosphorus-containing fat with the amino acid serine) and phosphatidylcholine (combining a phosphorus-containing fat with the B-vitamin choline). Both phospholipids are incorporated into the fatty membranes of brain cells, where they enhance cell-to-cell communication. They can also improve memory and mood and may slow the progression of age-related cognitive decline.^{6 7 8 9}
¹⁰ A recent study in the *American Journal of Clinical Nutrition* reported that a combination of EPA, DHA, and phosphatidylserine improved attention span in hyperactive children.¹¹ *Consider 1 daily tablespoon of lecithin granules. Made from soy, lecithin is rich in both phosphatidylserine and phosphatidylcholine.*
- *B-Complex Vitamins* - These vitamins have diverse supportive roles in mood and brain energy levels. Vitamins B6, B12, and folic acid are needed to make neurotransmitters, the chemicals that regulate our moods. Vitamins B1, B2, and B3 are involved in "bioenergetics," the process that

energizes cells. Supplements can often take the edge off feelings of nervousness or apprehension and help maintain healthy moods. *Consider a high-potency B-complex supplement.*

Neurotransmitters, Neuronutrients, and Mood

Our moods—whether we're feeling up or down—are regulated in large part by the activity of brain chemicals called neurotransmitters. Neurotransmitters also play important roles in memory and other cognitive processes.

- *Acetylcholine* -Based on the B-vitamin choline, the neurotransmitter acetylcholine plays important roles in our thinking processes and memory, concentration, and sexual arousal. Acetylcholine is not available as a supplement, but choline, phosphatidylcholine, and alpha GPC are all supplements that the body easily converts to acetylcholine. *Consider 200 mg daily.*
 - *GABA* - (Gamma-AminoButyric Acid) is both an amino acid (protein building block) and a calming neurotransmitter. It helps the brain filter out distractions, enabling us to focusing on specific thoughts or tasks. *Consider 500 mg, one to three times daily.*
 - *L-Taurine* - This amino acid functions as a calming neurotransmitter, and supplements have a mild sedative effect. *Consider 500 to 1,000 mg daily, taken at least one hour away from meals.*
 - *L-Theanine* - Found in high-quality green and black teas, L-theanine is an amino acid that increases the activity of alpha waves in the brain, leading to improved mental focus and a greater sense of relaxation.¹² Supplements may reduce feelings of anxiousness and tension. *Consider 100 to 200 mg, once or twice daily. Combine with GABA.*
 - *L-Tyrosine* - This amino acid serves as the basic building block of our stimulating neurotransmitters, including dopamine, noradrenaline, and adrenaline. *Consider 500 mg daily of L-tyrosine 15 minutes before breakfast.*
 - *5-HTP* - This form of the amino acid L-tryptophan is readily converted to serotonin, a calming neurotransmitter. It helps maintain healthy moods and promotes healthy sleep patterns. *Consider 50 to 100 mg three times daily, at least one hour away from any food.*
- **TLC for Younger Brains** - Talk with the parents of young children and you'll find that a common concern is their kids' attention span and ability to learn. The brain is particularly sensitive to poor nutrition, and the first signs of nutritional deficiencies or imbalances may appear as mood and behavioral changes.
 - You can hinder brain development by putting children on a low or no-fat diet. Instead, opt for healthy fats, such as the omega-3 fish oils and those found in olive oil, avocados, and nuts—while avoiding trans fats (such as those found in hydrogenated vegetable oils).
 - The late David Horrobin, M.D., found that a combination of supplemental omega-3 fish oils and gamma-linolenic acid (a plant oil) could improve attention span and learning, while also reducing hyperactive behavior.
 - French researchers have found that a combination of magnesium and vitamin B6 supplements reduced hyperactive symptoms in children. Those symptoms included poor attention, physical aggressiveness, twitchiness, and spasms.¹
 - High blood sugar will make kids sleepy, whereas low blood sugar will leave them feeling cranky. Focus on quality protein, vegetables, and fruit to keep blood sugar levels in a healthy range. Do your best to minimize fried foods and foods with added sugars.

Common Mood and Cognitive Problems

Feelings of sadness - Sometimes feeling blue has an obvious cause, such as grief, which can lead to profound changes in brain chemistry, other times the reasons may not be so obvious. Seasonal Affective Disorder—the wintertime blues—may be related to low levels of vitamin D during the shorter days of autumn and winter.

Nutrition Tips: Taking a high-potency B-complex supplement can often brighten moods. • The herb St. John’s wort (*Hypericum perforatum*) has been shown to help maintain healthy moods.^{13 14 15 16 17 18} Take 300 mg daily of a standardized extract three times daily. • A recent study in the *Journal of Nutrition* found that high-dose vitamin D supplements led to significant reductions in feelings of sadness.¹⁹ Try 2,000 to 5,000 IU of vitamin D₃ daily.

Apprehension and Tension - Stress generates feelings of anxiousness and tension. Consuming large amounts of caffeine in coffee, tea, energy drinks, and soft drinks can amplify those feelings. Caffeine increases the body’s production of adrenaline and other stimulating neurotransmitters.

Nutrition Tips: The B-complex vitamins can often reduce feelings of stress; they have been considered anti-stress vitamins since the 1940s. • The omega-3 fish oils (1 to 3 grams daily) and L-theanine (Suntheanine® specifically, 100 to 200 mg daily) are helpful as well.

Impulse Control - The addictive nature of personal technologies—email, texting, and tweets—have encouraged new types of distractions and impulsive-control disorders in children, teens, and adults. People on cell phones drive slowly and walk erratically, and who hasn’t noticed the annoying blue lights of cell phones in movie theaters?

Nutrition Tips: One of several different supplements can ease impulse-control problems. The omega-3 fish oils (1 to 3 grams daily) combined with gamma-linolenic acid (a plant oil, 100 to 200 mg daily) can be very helpful. • L-theanine (Suntheanine® specifically, 100 to 200 mg daily), GABA (500 mg daily), and N-acetylcysteine (1,200 to 1,800 mg daily) will likely help as well.

Irritability, Anger, and Aggressiveness - Some people go through life with a perpetual chip on their shoulders, and often, their anger is directed at people and situations unrelated to the actual source of the emotional turmoil. Blood-sugar fluctuations, toxic metal exposures, and nutritional deficiencies and imbalances can set the stage for anger and aggressiveness. Researchers at the Pfeiffer Treatment Center in Warrenville, Illinois, found that the majority of patients with intense angry outbursts had abnormally high levels of copper relative to zinc.

Nutrition Tips: Two types of supplements can often help. • One is a high-potency B-complex (or high-potency multivitamin) supplement. • The other is omega-3 fish oils. • It’s also important to adopt a high-protein, low-carb, low-sugar diet.

Mood Swings - All of us have encountered people we might have described as moody or mercurial. One moment they can be pleasant, the next dark and brooding. Moods often track with blood glucose levels, and low blood sugar triggers feelings of hunger, impatience, and irritability.

Nutrition Tips: A diet relatively high in quality protein and low in starchy and sugary foods usually stabilizes blood sugar levels. • High-carbohydrate and high-sugar diets deplete vitamin B1, so extra amounts (e.g., 50 to 100 mg daily) of this vitamin, combined with a high-potency B-complex supplement, might be helpful.²⁰ • Chromium (500 to 1,000 mcg daily) and biotin supplements (1,000 to 5,000 mcg daily) can improve blood sugar levels as well.

Memory problems - Although occasional forgetfulness is not a risk factor for Alzheimer's disease, it can be worrisome. At the very least, it may interfere with our performance at school or work and undermine our self-confidence. It helps to remain mindful of and focused on specific tasks to reduce the effect of distractions.

Nutrition Tips: Docosahexaenoic acid (DHA), one of the key omega-3 fats, can sharpen memory.^{21 22} • So can the B-vitamin choline, although lecithin granules may provide a greater benefit because they also contain hefty amounts of phosphatidylcholine and phosphatidylserine. • Ginkgo biloba supplements can also help memory (follow label directions). • In addition, supplements of coenzyme Q10 (100 to 200 mg daily) and acetyl-L-carnitine (500 to 2,000 mg daily) may enhance memory.

Age-related cognitive impairment - In most cases, age-related cognitive impairment takes decades to develop, so prevention is paramount.

Nutrition Tips: Several studies have found that vitamin B12 deficiency can mimic the symptoms of age-related cognitive impairment. In these cases, replenishing vitamin B12 will restore normal cognitive function.^{23 24 25 26} • Other B-complex vitamins will likely be helpful in combination with vitamin B12. People who consume a lot of omega-3 fish oils throughout their lives have a lower risk of developing age-related cognitive impairment. • The long-term use of beta-carotene supplement may help maintain cognitive function during aging, according to a study by researchers at Harvard University.²⁷ • Some research has shown that phosphatidylserine can reverse age-related memory loss.^{28 29} • While the breakdown of acetylcholine, a neurotransmitter involved in memory processing and learning, is normal and necessary in a healthy brain, Alzheimer's patients tend to have very low levels, and inhibiting its breakdown helps to compensate for these low levels. Huperzine A may improve symptoms of age-related cognitive decline, largely by inhibiting acetylcholinesterase, the enzyme that breaks down acetylcholine. The most effective dose appears to be 400 micrograms per day.^{30 31 32}

References available on request.