

Homing in on Focus and Attention

Nutrients to Maximize a Child's Full Brain Potential

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As we say goodbye to summer break and welcome another school year, most parents and kids have visions of textbooks and homework dancing in their heads. Although this can be a time of fun-filled education for most, there may be a sense of apprehension for some due to attention and focus difficulties. Attention deficient disorder (ADD) or ADD with hyperactivity (ADHD) have steadily become a leading diagnosis in school-age children. The primary treatment is prescription drugs (e.g. Ritalin), which not only have serious side effects, but are also suspected of creating long-lasting negative changes in the structure and function of the brain.¹ Regardless of a condition label, if a child's behavior is interfering with his or her life at school or home, there is a problem that needs to be addressed. This can include poor concentration, inattentiveness, difficulty maintaining normal academic progress, or excessive fidgetiness. One thing is clear; prescription drugs are not the only way to resolve these issues, nor the best.

What's "Under" the Behavior Problems?

Adding to the confusion with these conditions is the fact that nearly every child has displayed some ADD or ADHD symptoms at one time or another. Ultimately, it is best to focus on supporting a child's brain so that they can reach their maximum potential. The best place to start is to look at the possible triggers to misbehavior and attention troubles. Dr. Mary Ann Block, an expert in the field, states in her book *No More Ritalin*² "One does not outgrow ADHD symptoms. If you do not resolve the problem by fixing the underlying cause, it remains a problem that will have to be treated for a lifetime. Placing children on drugs when they're young does not fix the problem." One of the foundational concepts that must be addressed when looking at the underlying cause of these issues is nutrition. Besides nutrient insufficiencies, other factors that may contribute to the symptoms of ADHD are adrenal fatigue or thyroid dysfunction.²⁵ Overgrowth of unfriendly organisms in the intestinal system, like candida, is another possible trigger.³ Numerous studies have also confirmed a strong relationship between childhood learning disabilities and body stores of heavy metals, particularly lead.⁴ Other environmental stresses or pollutants can also impact learning and behavior.⁵

On the Road to Full Brain Potential

Healing must begin with a nourishing diet; however, when deficiencies and imbalances are present, therapeutic doses of nutrients are instrumental. Furthermore, it is almost impossible to take in all the nutrients one needs through foods with the typical diet. This is where supplementation comes in. The first supplement that should be considered is a high potency multiple vitamin and mineral. This provides a wide range of nutrients to help prevent and calm ADHD by protecting the nervous system from free radical damage, and supporting the body's production of neurotransmitters – vital brain messengers like serotonin that are responsible for learning and behavior. One study found that when school-age children (6 to 12) with behavioral problems, such as ADHD, supplemented with a multi-vitamin, they had much better control over antisocial behaviors, such as swearing, vandalism, assault, and refusal to work.⁶ Another study published in the 2003 issue of *Alternative Medicine Review* found a supplement program (a mixture of vitamins, minerals, amino acids, essential fatty acids, and probiotics) to be as effective as Ritalin for a group of children with ADHD.⁷

In addition to a multiple vitamin and mineral, other nutrients can be used to maximize a child's brain potential. There are many available products and formulas geared toward children that are tasty and easy to take. Below is a detailed description of the nutrients backed by scientific research for supporting focus, attention, positive behavior, and brain function in children.

Essential fatty acids (EFAs), namely EPA and DHA, are one of, if not the, most important nutrient group when it comes to supporting the brain.^{8,9,10} These special fats are found primarily in fish oil and fish liver - foods children tend to not consume in abundance. A deficiency in EFAs is being identified as a cause of ADHD.^{11,12,13,14} EFAs influence behavior by supporting intestinal permeability and the proper development of brain tissue.¹⁵ In a 12-week, double-blind study, children with ADHD were given either a placebo or a fatty acid supplement providing daily: 186 mg of EPA, 480 mg of DHA, 96 mg of gamma-linolenic acid (GLA), 864 mg of linoleic acid, and 42 mg of arachidonic acid. Compared with the placebo, the fatty acid supplement produced significant improvements in both cognitive function and behavioral problems with no adverse effects.¹⁶ Up to 1 TBSP of a liquid per day can be taken¹⁷ - depending on weight and individuality. Be sure to supplement at least 100 mg/day of DHA.¹⁷

Magnesium is another common deficiency in children with ADHD.¹⁸ One study found that 95% of 116 kids with ADHD were deficient in this calming mineral.²⁹ In another trial, children with ADHD and low magnesium status were given 200 mg/per day for six months. Those taking the mineral had a significant decrease in hyperactive behavior compared to those who did not receive the nutrient.¹⁹

Iron helps regulate the activity of dopamine, a neurotransmitter synthesized by the adrenal glands and intricately involved in behavior and concentration. Researchers evaluated 14 ADHD boys between the ages of seven and 11 for the effect of short-term iron administration on behavior. Each boy received 5 mg/kg body weight of iron daily for 30 days. In the end, the parents believed the children's behavior improved.²⁰ Iron, the most absorbable "heme" form, is found abundantly in meat, poultry, and fish.

Zinc is an important cofactor for producing the brain supportive neurotransmitters, like serotonin and dopamine, and other brain substances, all of which are involved in ADHD. A zinc deficiency has also been linked to ADD/ADHD incidence.²¹ One study showed that ADHD children had less than half the levels of zinc than the non-ADHD control group.²² Copper needs to be taken with zinc to prevent imbalance.⁴ Foods high in zinc include pumpkin seeds, meats, eggs, and seafood.

Vitamin C and proanthocyanidins (found in grape seed extract) are essential for several brain functions. Vitamin C is needed to manufacture neurotransmitters, and to protect the brain from free radical damage.²⁴ Proanthocyanidins enhance the effects of vitamin C and modify enzymatic activities particular to the brain.²³ Proanthocyanidins also reduce inflammation that can be related to allergic reactions²⁴ and they encourage dopamine activity in the brain, which can help with focus and concentration.²⁵

B vitamins have also been successfully used for ADHD. These nutrients are involved in assisting brain enzymes in using carbohydrates for energy, helping synthesize neurotransmitters such as serotonin, dopamine, and GABA, and forming the myelin shields between brain neurons. B1 (thiamin) deficiency is known to contribute to nervousness and irritability. Deficient levels of vitamin B6, which causes low serotonin levels, have also been detected in children diagnosed with ADHD.²⁶

Phosphatidylserine (PS) is a fat-soluble phospholipid and a key component of all cell membranes, but is found in particularly high concentrations in the brain. This nutrient is extracted from lecithin, and is found in foods such as soy and eggs. PS is gaining recognition as a focus and attention-supporting nutrient due to its role in benefiting a wide range of brain functions.²⁷ It supports neurotransmitter production (namely dopamine) and maintains nerve connections. In a study where a group of 27 ADHD children took 200 to 300 mg of PS daily for four months, researchers found that 25 children exhibited improvement in learning capacity and behavior with no adverse affects.^{28,29,30}

Additional Brain Boosters to Consider

Probiotics, the friendly bacteria naturally found in the intestinal tract, may need to be enhanced in children with attention issues. Brain function can be influenced by *dysbiosis*, which occurs when there is an overgrowth of unfriendly organisms in the intestinal system and an absence of the beneficial. This

imbalance is encouraged by the use of antibiotics, which often destroys the good bacteria along with the bad. The average child undergoes multiple courses of antibiotic treatment in the first five years of life, typically without replacement of probiotics. The resulting overgrowth of yeast and other pathogenic flora has been linked to alterations of immune function, food sensitivities, and behavior. A study reported that high levels of harmful substances, particularly *Candida*, were identified in the urine of children with ADHD.³¹ In addition to supplementation, another good way to support the friendly bacteria is to consume fermented foods like plain yogurt, kefir, miso, and raw sauerkraut.

Amino acids, the building blocks of protein, are essential for the production of neurotransmitters (e.g. serotonin and dopamine), which are crucial for reducing ADHD symptoms. Children with ADHD are often deficient in L-glutamine, a precursor for gamma-aminobutyric acid (GABA), a neurotransmitter that calms the mind and may play a role in hyperactivity.^{32,33} GABA supplementation itself has also been shown to be helpful.⁵ Tyrosine supplementation has been shown to increase dopamine concentration dramatically and produce impressive anti-stress³⁴ and pro-concentration results.^{35,36}

DMAE (Dimethylaminoethanol) accelerates the brain's production of acetylcholine, a substance that plays a role in the brain's nerve impulse transmission. DMAE is naturally found in brain foods like anchovies and sardines. As a supplement for ADHD, it has been used effectively to support such symptoms as shortened attention span, hyperactivity, learning and behavior problems, reading and speech difficulties, and impaired motor coordination.³⁷

Choline, a precursor for acetylcholine, is another possible nutrient to consider for children with ADHD. One study found that poor memory and developmental instability correlated with lower concentrations of choline-containing compounds.³⁸

5-HTP (5-hydroxytryptophan) is a precursor for serotonin, a brain neurotransmitter involved in learning and behavior. Researchers have found that blood levels of serotonin tend to be lower in children with more severe symptoms of hyperactivity, impulsiveness, aggressiveness, and lack of concentration.³⁹ Although the research is limited, supplementation with 5-HTP may help those with more severe ADHD symptoms.

Stress-reducing herbs, such as passion flower, valerian, or lemon balm, may be appropriate because stress contributes to ADHD.⁴⁰ Interestingly, Ritalin (methylphenidate) appears to work like ginkgo and other herbs by increasing regional cerebral blood flow.⁴¹ A study of a combination herbal product containing American ginseng extract (200 mg) and Ginkgo biloba extract (50 mg) found that between 31%-74% of those taking the herbs experienced improvements in such symptoms as anxiety, shyness, social problems, hyperactivity, and impulsiveness.⁴²

Algae, such as **spirulina**, has also been suggested to help with ADHD symptoms. Spirulina may help by removing aluminum and other toxins from the body.^{43,44} This food supplement also contains amino acids and other easy-to-absorb nutrients. One study found an 81% improvement in academic scores when children took one gram of spirulina every day for six months.⁴⁵ In another study using 1 gram of blue-green algae daily for 10 weeks with 109 children, most of the children showed significant improvement in their ability to focus, concentrate, and follow directions.²⁹

As you can see, there are many natural choices when dealing with behavior and learning challenges. It is imperative for parents to look at all the possible contributing causes and be a health detective. Be sure to provide plenty of healthy foods and well-designed meals, and supplant TV and video games with exercise and outdoor activities. Finally, consider your supplement options and choose what will offer your child the best opportunity to reach their maximum brain potential – naturally!

This article is strictly educational and not meant to replace a physician's recommendations. It is best to talk with a doctor if you are taking medications before trying to incorporate or substitute any of the above options.

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