

ADHD: Overview and Risk Factors

Attention deficit/hyperactivity disorder (ADHD) is defined as a persistent lack of attention to tasks and/or a lack of ability to control impulses, along with an increased level of physical agitation relative to others at a similar stage of development. According to estimates, ADHD occurs in three to six percent of all children in the United States, with rates as high as 15 percent reported in some areas. This makes ADHD the most commonly diagnosed behavioral disorder of childhood. Children with ADHD are placed at a substantial disadvantage in school, and ADHD can have long-term effects on the quality of life.

ADHD can occur in adults as well, although the more prevalent diagnosis in adult populations is attention deficit disorder (ADD). The crossover between the two conditions is large enough for there to be debate as to whether children with ADHD actually outgrow it, whether ADHD merely transforms into ADD as time goes on, or even whether the two conditions can realistically be separated. Certainly in the case of treatment methods, the differences are minor compared to the similarities.

Medications are used to treat both of these conditions with stimulants such as Ritalin, Dexedrine, Concerta, Metadate CD, Focalin, Daytrana and Adderall. These treatments are selected most frequently. Other protocols include various neurotransmitter reuptake inhibitors, antidepressants and occasionally antipsychotics.

Many of these compounds are quite powerful, and there is justifiable concern about their long-term use. Fortunately, a number of behavioral and nutritional strategies have also been found to improve symptoms of ADHD, and potentially reduce the amount of medications required

Risk Factors for ADHD

Heredity (the greatest risk)
 Smoking, drinking, and drug use during pregnancy
 Low birth weight
 Altered brain function and anatomy
 Exposure to lead
 Exposure to pesticides
 Food preservatives and additives

ADHD often occurs alongside other conditions such as a learning disability, oppositional defiant disorder (ODD), anxiety, depression or drug use.

It is difficult to assign a single cause of ADHD. It is most likely a combination of genetic, environmental and nutritional factors. Consequently, most experts recommend a multidisciplinary, team-based approach to both the diagnosis and treatment. Such an approach should involve physicians, child behavior experts and parents to make decisions consensually. Nutritional experts may also be very valuable members of the treatment team.

Children with ADHD may have specific nutrient deficiencies that aggravate their condition. As researchers learn more about the correlation between diet and behavioral disorders, the case for nutritional intervention for children with ADHD becomes more compelling.

Using nutraceutical support, there is a primary interest in nutrients that are known to be sources and/or precursors of neurotransmitters — providing protection and support of the neurological system and display antioxidant activity. Of secondary interest are compounds that optimize nutrient digestion and absorption, while also helping to regulate blood sugar levels and eliminate allergens and additives.

Nutrient Support for ADHD Protocol

Recommended Nutrients	Purpose
Omega-3 Fatty Acids	Omega-3 fatty acids help to enhance and stabilize mood and facilitate neurological function and aid in maintaining the normal flow of oxygen-rich blood to the brain.
Antioxidants	Antioxidants support healthy blood glucose levels, combat free radicals, reduce inflammation and reduce oxidative damage to major organs, including the brain.
Grape Seed Extract	Rich in polyphenols, compounds with high antioxidant activity.
Red Wine Extract	Displays powerful antioxidant properties, maintaining healthy circulation by strengthening capillaries, arteries and veins.
Pine Bark Extract (Pycnogenol®)	Extremely potent free-radical scavenger, reduces oxidative damage to major organs and supports healthy blood glucose levels.
Bilberry Extract	Supports venous circulation and helps maintain healthy circulation by strengthening capillaries, arteries and veins.
Citrus Extract (Bioflavonoids)	Demonstrates anti-inflammatory activity.
Amino Acids	Amino acids provide the material needed to produce neurotransmitters, the regulatory chemicals of the brain that are directly responsible for regulating mood, mental activity and focus.
Tryptophan	Serotonin precursor.
L-Phenylalanine	Boosts noradrenalin production.
L-Tyrosine	Precursor to dopamine, norepinephrine and epinephrine.
Glutamine	Helps to improve mental activity.
Botanical Extracts	Botanical extracts function as adaptogens, which assist in stress response, focus and mental clarity by supporting the brain's metabolism of glucose and oxygen.
<i>Ginkgo biloba</i>	Increases cerebral blood flow and the supply of oxygen to the brain, boosts the brain's metabolism of glucose and heightens electrical activity.
Korean Ginseng	Helps to promote mental clarity, improve cognitive function and memory, and counteracts stress.
Eleuthero (Siberian Ginseng)	Increases cognitive function, memory, concentration and cognitive abilities, and promotes mental equilibrium.
Probiotics	Probiotics support the complete absorption and utilization of important nutrients, along with the complete breakdown of proteins, food additives, food allergens and toxins, which can compromise brain function and contribute to ADHD.
<i>Lactobacillus rhamnosus</i>	Aids in balancing the gastrointestinal microflora and supports digestion and immune function.
<i>Lactobacillus salivarius</i>	Supports homeostasis within the intestines as well as digestion and immune function.
<i>Lactobacillus plantarum</i>	Reduces unhealthy bacterial populations while preserving nutrients, antioxidants and vitamins, and synthesizes L-lysine.

Recommended Nutrients	Purpose
Digestive Enzymes	Digestive enzymes support the complete absorption and utilization of important nutrients, along with the complete breakdown of proteins, food additives, food allergens and toxins, which can compromise brain function and contribute to ADHD.
Sucrase (Invertase)	Supports the hydrolysis of sucrose into glucose and fructose.
Maltase	Promotes the hydrolyzation of the disaccharide maltose into two monosaccharide glucose molecules.
Papain	Extensively breaks down animal proteins.
Caso-Glut SP 500 (Protease)	Supports the normal breakdown of proline-containing proteins, such as casein and gluten.
Kiwi Proteases (Actinidin)	Supports the body's ability to degrade cysteine residues in proteins.
Vitamins	Vitamins act as precursors and components of neurotransmitters in the brain, support nerve function, regulate energy and help maintain stable blood sugar, all of which contribute to cognitive function and aid in regulating mood.
Vitamin A (Beta-Carotene)	Supports neurological function and demonstrates antioxidant activity.
Vitamin B1 (Thiamin HCl)	Promotes proper neurotransmitter activity in the brain.
Vitamin B3 (Niacinamide)	Supports the proper functioning of the digestive system, skin and nerves.
Vitamin B5 (D-Calcium Pantothenate)	Detoxifies brain tissue and helps mitigate physical and emotional stress.
Vitamin B6 (Pyridoxal-5-Phosphate)	Promotes the normal conduction of nerve impulses and regulates synthesis of neurotransmitters.
Vitamin B7 (Biotin)	Maintains steady blood sugar levels.
Vitamin B9 (Folinic Acid)	Required for the production of energy, integral to brain and nerve cell function, and promotes normal homocysteine levels.
Vitamin B12 (Methylcobalamin)	Regulates energy and concentration and is associated with the production of acetylcholine.
Vitamin C	Supports cognitive function, cofactor for dopamine production and demonstrates antioxidant activity.
Vitamin D3 (Cholecalciferol)	Contributes to neurotransmitter synthesis and nerve growth and demonstrates antioxidant activity.
Minerals	Minerals support the activity of neurotransmitters in the brain, support nerve function, regulate energy and help maintain stable blood sugar and aid antioxidant activity, all of which contribute to cognitive function and aid in regulating mood.
Calcium	Supports normal conduction of nerve impulses.
Chromium (Amino Acid Chelate)	Supports insulin in helping to maintain healthy blood sugar levels.
Copper	Supports glucose metabolism and brain development. When attached to superoxide dismutase enzymes (SODs) with zinc, acts as an antioxidant.
Magnesium (Lactate)	Promotes normal production of neurotransmitters.
Manganese (Sulfate)	Supports fat and carbohydrate metabolism, calcium absorption and blood sugar regulation, and promotes normal brain and nerve function. When attached to superoxide dismutase enzymes (SODs), acts as an antioxidant.
Selenium (Selenomethionine)	Functions as part of glutathione peroxidase and supports the antioxidant effect of vitamin E.
Zinc (Sulfate)	Supports brain maintenance and development, cell reproduction, vision and immunity, and protects against free radicals. When attached to superoxide dismutase enzymes (SODs) with copper, acts as an antioxidant.

Dietary Recommendations

Macronutrients

- Protein should be prioritized in the diet and be included in every meal, as well as become a first choice for snacks. Meats, eggs, nuts and dairy are ideal sources.
- All simple carbohydrates should be kept to a minimum. In addition to sugar, foods such as rice, pasta, noodles, bread, cereals, fruit juices, milk, yogurt, common snack foods, desserts and sodas should be carefully monitored.
- Low-glycemic index carbohydrates, in the form of vegetables and fruit are encouraged.
- Food additives and artificial ingredients are a major concern—consumption of prepackaged foods should be eliminated or kept to an absolute minimum.

General Eating Practices

- Skipping meals must be avoided and meals or snacks should be distributed evenly, at three to four-hour intervals.
- It is recommended to consume three meals a day, plus snacking as needed.

Lifestyle Recommendations

- Regular exercise is a first priority — it has been shown to boost production of neurotransmitters and alleviate stress. Schedule a daily exercise, preferably at the same time everyday.
- Establish other daily routines at school and at home — recurring tasks help to establish structure and a sense of security. It also reduces impulsive behaviors and distractions.
- Promote concentration and focus by presenting only one task or activity at a time.
- Introduce activities that encourage relaxation and mindfulness, such as meditation.
- When communicating, practice maintaining eye contact and provide positive feedback as appropriate.

Potential Interactions

While it is not uncommon for ADHD patients to use natural medicines in addition to conventional medicines, most prescription medications for ADHD/ADD are very strong. Consequently, it is advised to pay extra attention to interactive effects and to cross-check medications with a reliable source, such as The Natural Medicines Comprehensive Database (naturaldatabase.therapeuticresearch.com).

Patients currently taking monoamine oxidase inhibitors (MAOI) or other antidepressants such as Zoloft or Paxil, psychoactive or tranquilizing drugs such as Clonopin or Valium, or pain medications such as Demerol or Ultram are in a higher-risk category for interactions with supplements containing tryptophan and other essential amino acids.

Patients currently taking monoamine oxidase inhibitors (MAOI), angiotensin converting enzyme inhibitors or warfarin (Coumadin), or other antiplatelet/anticoagulant drugs, levodopa or other central nervous system depressants, or who have phenylketonuria, high blood pressure, thyroid disease and/or Graves' disease, liver disease, schizophrenia, seizure disorder or bipolar disorder are at a higher risk for interactions with supplements containing phenylalanine, tyrosine, ginseng, *Ginkgo biloba* or other natural stimulants.

Patients taking anticonvulsants, antibiotics and anticoagulant/antiplatelet drugs are in a higher risk category for interactions with digestive enzymes and probiotics.

Female patients who are pregnant or breastfeeding are advised against supplements containing tryptophan, phenylalanine, tyrosine, probiotics, digestive enzymes, ginseng, *Ginkgo biloba* and other natural stimulants.

Suggested Further Reading

ods.od.nih.gov
naturaldatabase.therapeuticresearch.com (NMCD)
ncbi.nlm.nih.gov/pubmedhealth
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Articles of Interest

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Scientific Support for Ginseng/Ginkgo Biloba Supplementation

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