



Dietary Supplements and Herbs

(BBB Autism; printable Article #26)

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Dietary supplements and herbal remedies are big business these days, thanks to articles and books touting the benefits of everything from garlic to herbal antidepressants. Here are some that you may hear about in relation to pervasive developmental disorders.

Minerals

Several minerals are essential for optimal health. Some are also necessary for utilizing certain vitamins.

Calcium is important for the regulation of impulses in the nervous system and for neurotransmitter production. However, excessive levels of calcium (hypercalcinuria) can result in stupor and have been reported to occur naturally in some autistic people.

Magnesium lowers blood pressure and is also important for the regulation of impulses in the nervous system and neurotransmitter production. If you are supplementing with vitamin B6, you will need to add magnesium as well.

Iron (ferrous sulfate) deficiency in infants can inhibit mental and motor-skills development. Most children do not need an iron supplement, however, and too much iron can cause digestive and elimination problems. Adult women and some older adults may need to add a small amount of iron to their diet in supplement form.



Enzymes and sulfates

Enzymes are produced in the human digestive tract to digest various types of food. Protease acts on protein, amylase on carbohydrates, lipase on fats, pectinase on pectins (found in some fruits and other foods), and cellulase on fiber.

Other enzymes are produced to detoxify the body. One study, and some subsequent clinical research, has shown that many people with autism have lower than normal detoxification enzyme activity. 1. This activity, which relies on a steady supply of sulfate, is essential for maintaining the GI tract's mucous membrane and for moving toxins out of the body through hydrolation. If the mucous membrane in the gut is in good shape, the brain will be protected from a buildup of phenolic compounds, which can interfere with neurotransmission. If it is not, nervous-system problems can ensue.

2. Some people with a documented sulfation problem take the enzyme methyl sulphonyl-methane (MSM, or sulfur), which they believe may help them produce the sulfate. It is hard to digest, however. In addition, commercially available MSM is derived from dimethylsulfoxide (DMSO), a substance that has been touted as a boon for so many conditions that one might rightfully be cautious about trying a derivative.

Others have added the amino acid N-Acetyl-Cysteine (NAC), which is also said to have antispasmodic qualities. Another recommendation is taking frequent Epsom salts (hydrated magnesium sulfate) baths. Neither of these approaches is proven to work, but the baths are certainly relaxing and harmless, and some patients do seem to improve as a result. For those who would like to try the Epsom salts approach, one parent who achieved positive results with her child (reduced oppositional behavior and improved language skills) recommends using one and a half to two cups of Epsom salts per daily bath. "Sulfur (Epsom salts) improved socialization," says Holly, mother of three-year-old Max (diagnosed PDD-NOS).

Researchers have noted that dairy and gluten digestion difficulties would be expected in people with low sulfation, lending credence to the gluten-free/casein-free diet approach for these individuals.

Food items that are high in phenols might also be removed from the diet with beneficial results. Among the many phenols are tannin, which gives tea and persimmons their tang; quercitin, found in green beans and rhubarb; and coumarin, found in cabbage, radishes, and spinach. Other items high in phenols include apples, grapes, avocados, and other fruits; some artificial food colorings; many spices, such as cloves and saffras; some preservatives, particularly the ubiquitous BHA and BHT; some herbs used in antioxidant compounds and teas, including grapeseed oil and comfrey tea; chocolate, coffee, and red wine.

Phenols are also used in many manufacturing processes, cleaning products, insecticides, plastics, and chemical compounds. These products and their fumes should be avoided by people with extreme sensitivity to phenols.

Essential fatty acids

The essential fatty acid (EFA) **linoleic acid** and its derivatives, including **gammalinolenic acid (GLA)**, **dihomogamma-linolenic acid (DGLA)**, and **arachidonic acid (AA)**, are also **called omega-fatty acids**. These substances come from animal fats and some plants. Another type of EFAs, omega-3 fatty acids, are found almost exclusively in fish oils. As the "essential" in their name implies, these substances are needed to build cells and also to support the body's anti-inflammatory response. They are the "good" polyunsaturated fats that improve cardiovascular health when substituted for the "bad" saturated fats.

The heart and blood vessels aren't the only beneficiaries of EFAs, however. People with autoimmune diseases that involve the nervous system say EFAs are very helpful in reducing symptoms, and there is some research to back them up. EFAs



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appear to help the GI tract resist and repair damage, probably by restoring the lipid cells. Recent research in psychiatry has even found that omega-3 fatty acids can act as a mood stabilizer for some people with bipolar disorder. Researchers believe that a proper balance between omega-3 and omega-6 fatty acids is also important for optimal health.

Evening primrose oil (EPO) is one of the best EFA sources around, and has become a very popular supplement as a result. Other plant sources for omega-6 fatty acids include borage oil, flax-seed oil, and black current seed oil. The omega-6 fatty acids in evening primrose oil have been reported to lower the threshold for frontal-lobe seizures, however, so people who have seizures should exercise caution. All are available as gelatin caps.

Efamol and Efalex (<http://www.efamol.com/about/about.html>) are brand-name EFA supplements made by Efamol Nutraceuticals, Inc. Efalex was specifically created to treat developmental dyspraxia in the UK and is widely touted as a supplement for people with ADD or ADHD as well. Efalex contains a mix of omega-3 fish oil, omega-6 EPO and thyme oil, and vitamin E. Efamol, marketed as a treatment for PMS, combines EPO; vitamins B6, C, and E; niacin zinc and magnesium. Both of these commercial EFA supplements are now available in the US and Canada as well, and can be purchased by mail order. Unlike many supplements manufacturers, Efamol adheres to strict standards and also sponsors reputable research.

EicoPro, made by Eicotec, Inc., is another brand-name EFA supplement you may hear about. It combines omega-3 fish oils and omega-6 linoleic acid. Eicotec is another supplements manufacturer known for its high manufacturing standards.

Monolaurin is made by the body from lauric acid, medium-chain fatty acid that is found in abundance in coconuts and some other foods, including human breast milk. It is known to have antibacterial and antiviral properties. Monolaurin may be the active ingredient in colostrum, the "pre-milk" all mammals produce to jump-start a newborn's immune system. Cow colostrum is actually available in supplement form in some areas.

NutriVene-D is a supplement, created for people with Down's syndrome that mixes EFAs, vitamins, and other substances.

It's great if you can get your EFAs in food. Low-fat diets are part of the reason some people, especially those who are trying to lose weight, may not get enough. Many cold-pressed salad oils, including safflower, sunflower, corn, and canola oils, do contain EFA. When these oils are processed with heat, however, it may destroy or change the fatty acids. Oily fish are another great source, although, again, cooking may be a problem (and not everyone is a sushi fan).

It is possible to have lab tests done that can discern EFA levels?

"Our son's essential fatty acids were abnormal. Some were too high and others too low. His iron and copper levels were high. Supplements include evening primrose oil, laktoferron, many vitamins, etc. Our son's supplements cost about \$250 per month". --Joe, father of seven-year-old Kyle (diagnosed PDD-NOS with autistic features)

Diabetics may experience adverse effects from too much EFA, and should consult their physician before supplementing with EFA products.

DMG



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Dimethylglycine (DMG, calcium pangamate, pangamic acid, "vitamin B15") is a naturally occurring amino acid that may help some people with autistic spectrum disorders with speech production, increased stress tolerance, seizure reduction, and immune-system strengthening. Studies have been done in Russia and Korea with positive results for between half and 80 percent of the children given DMG, although they were not double-blind studies. New research results about the efficacy of DMG for people with autism are expected to be released soon.

"We have only used DMG for speech, and B6/magnesium. We are seeing improvements in both Nicole's articulation and in her ability to put sentences together. She has gained quite a few new words, and is attempting to place them in short sentences, whereas before she only used single words and more of a pull-and-point method. She definitely is trying harder to "say the words!" --Robin, mother of five-year-old Nicole (diagnosed mild autism)

DMG changes the way your body uses folic acid, so you may need to supplement it with that vitamin. Increased hyperactivity may result from a lack of folic acid when taking DMG.

Melatonin

Melatonin (MLT) is produced by the pineal gland and is responsible for helping the body maintain sleep and other biochemical rhythms. Studies have shown a deficiency or aberrant production of this hormone in autistic subjects, 3 and indeed, at least half of all people with autism have sleep disorders. Melatonin supplements given about half an hour before bed may be useful for addressing these problems. The effect may not be lasting, however. "Using melatonin for sleep worked awesome at first; now it is iffy," says Lesley, mother of three-year-old Danielle (diagnosed PDD-NOS).

Probiotics

As the name indicates, probiotics are intended to counteract the harmful affects of antibiotics. As most people who have taken a course of penicillin know, these valuable medications can cause digestive distress even as they heal infection. Probiotics are substances that attempt to restore the friendly intestinal cultures that help us digest our food. Among other things, these cultures (and other probiotics) keep the growth of *Candida albicans* yeast in balance.

Commercial probiotic supplements may combine a number of substances, sometimes including digestive enzymes as well as helpful bacteria, garlic, and the like.

Lactobacillus acidophilus, **Bifidobacterium bifidum**, and **Lactobacillus bulgaricus** are friendly bacteria more familiar to most of us as the "active cultures" found in some yogurts. Yogurt itself is a good probiotic for those who eat dairy products.

Soil-based organisms (SBOs) are microbes found in organic soils that are believed to help the body produce important enzymes. Some people believe that modern food-processing techniques have left people deficient in these, so they take SBO supplements. These are increasingly added to probiotic supplements. No information about benefits of use by people with PDDs is available at this time.

Garlic is said to be active against yeast in the digestive tract. You can swallow whole cloves raw or take it in a supplement.



Caprylic acid is a fatty acid said to be active against yeast in the digestive tract. **Medium chain triglycerides (MCT oil, also called caprylic/capric triglycerides)** are a liquid source of caprylic acid.

Biotin, a vitamin related to the Bs, is normally produced by friendly bacteria in the digestive tract. Replenishing these flora should ensure enough biotin, but some people do choose to take it directly.

Octocosanol

Octocosanol, usually derived from wheat germ, is supposed to increase stamina, reduce cholesterol, and address neuromuscular deficits. It appears on some lists of supplements that may reduce autistic symptoms, but its method of action is unknown, and it doesn't seem to have much of a track record with parents.

Lecithin

Lecithin (phosphatidyl choline) is a phospholipid found mostly in high-fat foods. It is much ballyhooed for its ability to improve memory and brain processes. Lecithin is necessary for normal brain development; however, double-blind studies of patients with Alzheimer's disease did not substantiate claims that it can help people recover lost brain function.

However, it's possible that increased amounts of lecithin may be one of the keys to the Ketogenic diet's success in some cases of hard-to-treat epilepsy. Some people with epilepsy have also reported reduced number and severity of seizures from taking lecithin as a supplement. It is possible that extra lecithin might be needed to rebuild damaged myelin protein.

There's no hard evidence that lecithin is a good idea for people with autism, but it does not appear to cause harm, and there are some logical reasons to think it might help--especially for patients who have seizures or who test positive for anti-MBP, the autoimmune agent believed to destroy myelin basic protein.

Lecithin is oil-based, and it gets rancid easily. It should be refrigerated. Lecithin capsules are available, but many people prefer the soft lecithin granules. These are a nice addition to fruit-juice smoothies, adding a thicker texture.

Choline is one of the active ingredients in lecithin. It is needed by the brain for processes related to memory, learning, and mental alertness, as well as for the manufacture of cell membranes and the neurotransmitter acetylcholine.

Inositol is one of the active ingredients in lecithin. It may help in cases of nerve damage and is required by the neurotransmitters serotonin and acetylcholine. Clinical studies have indicated that inositol supplements may be helpful for some people with obsessive-compulsive disorder,⁴ depression, and panic disorder.⁵ Benefits specific to autistic spectrum disorders have not been officially documented.

Herbal neurological remedies

Quite a few herbs have been used to treat neurological disorders through the ages. These substances are referred to as nervines, and some may prove useful for treating specific symptoms associated with autistic spectrum disorders. Of all the herbal remedies, this group of plant extracts are among the strongest, and the most likely to cause serious side effects.

Aloe Vera gel is sometimes recommended for GI tract problems. It's a traditional remedy for ulcers. It has anti-inflammatory (steroidal), hormonal, antioxidant, laxative, and other effects. Many people find it hard to take internally.



Black cohosh (Cimicifuga racemosa, squaw root), a nervous system depressant and sedative, is often used by people with autoimmune conditions for its anti-inflammatory effects. Its active ingredient appears to bind to estrogen receptor sites, so it may cause hormonal activity.

Chamomile is a mild but effective sedative traditionally used to treat sleep disorders or stomach upsets.

Damiana is a traditional remedy for depression.

Ginkgo biloba, an extract of the ginkgo tree, is advertised as an herb to improve memory. There is some clinical evidence for this claim. It is an antioxidant, and is prescribed in Germany for treatment of dementia. It is believed to increase blood flow to the brain.

Gotu kola is a stimulant sometimes recommended for depression.

Licorice is not just for candy or sore throats--it boosts hormone production, including hormones active in the GI tract and brain.

Passion flower is recommended by some herbalists for depression, anxiety, and seizure disorders.

Sarsaparilla, like licorice, seems to affect hormone production as well as settling the stomach and calming the nerves.

Skullcap, an antispasmodic and sedative, is found in both European and Ayurvedic herbals. It traditionally been used to treat tic disorders and muscle spasms, as well as seizure disorders, insomnia, and anxiety.

St. John's wort (hypericum) has gained popularity as an herbal antidepressant. It has the backing of a decent amount of research, but, as noted in Chapter 5, Medical Interventions, those choosing to use this remedy should follow the same precautions as with SSRIs and MAOIs, two families of pharmaceutical antidepressants. It can cause increased sensitivity to light. It is available prescription in Germany, where it is the most widely used antidepressant.

Valerian is a strong herbal sedative. It should not be given to young children.

Herbal antibiotics

Several herbs appear to have antiseptic, antiviral, antifungal, or antibiotic properties. Obviously, if these substances are active, they should be used carefully and sparingly, despite the claims of certain manufacturers who encourage daily use for disease prevention. Those who prefer herbal remedies might want to try **cat's claw** and **grapeseed oil**, both mentioned in the previous section on antioxidants, or one of the following:

Bitter melon (momordica charantia), an antiviral from the Chinese herbal pharmacopoeia, is the plant from which the active ingredient in some protease inhibitors (the powerful drugs used to combat AIDS) is derived.

Echinacea purpurea, another herbal antiseptic, also dilates blood vessels and is said to have antispasmodic qualities as well.

Goldenseal, an alkaloid isoquinoline derivative related to the minor opium alkaloids. Its active ingredient, hydrastine, elevates blood pressure. This is a very strong herb with antiseptic properties when taken internally or applied topically in powder or salve form. It acts on the mucous membranes of the GI tract when taken internally.



SPV-30, derived from the European boxwood tree, is a fairly new item in this category. It apparently includes some antiviral and steroidal (anti-inflammatory) compounds, and has become very popular among people with AIDS as an alternative to pharmaceutical antivirals.

Sphingolin

Sphingolin is a glandular supplement made from cow spinal-corn myelin, repackaged in pill form. Some practitioners recommend it for children who have tested positive for myelin sheath proteins in the bloodstream. It is used by quite a number of people with multiple sclerosis and other neurological disorders that involve demyelination.

Although anecdotal reports indicate that some people with PDDs have had symptom reductions when taking sphingolin, there could be a hidden problem with this supplement. It could contain particles that cause the deadly neurological disorder spongiform encephalopathy, "mad cow disease." It is not available in the UK for this very reason--and there's no reason to believe that this disease exists only in UK cattle or UK humans.

Evaluating supplement claims

No matter what kind of alternative practitioner or therapy you choose, it's just as important to be a smart consumer in this area as it is with traditional medicine. Unfortunately, it can be more difficult. Medications with approval from the FDA or similar government bodies undergo rigorous testing. Study results and detailed information about these compounds are available in numerous books, online, or directly from the manufacturers.

With "natural" remedies, that's not always the case. It seems like every week another paperback book appears making wild claims for a "new" antioxidant compound, herbal medication, or holistic therapy. The online bookstore Amazon.com lists nearly twenty titles about St. John's wort alone! These books--not to mention magazine articles, Web sites, and semi-informed friends--sometimes wrap conjecture up in a thin veneer of science. They may reference studies that are misinterpreted, that appeared in disreputable journals, or that were so poorly designed or biased that no journal would publish them.

Supplement salespeople, and particularly those who take part in multilevel marketing schemes, seem to have taken lessons from their predecessors in the days of the traveling medicine show. They have little to lose by making outrageous claims for their products and much to gain financially. Here are just a few of the unsupported claims found in a single five-minute sweep of supplement-sales sites on the Internet:

"Glutathione slows the aging clock, prevents disease and increases life."

"Pycogenol ... dramatically relieves ADD/ADHD, improves skin smoothness and elasticity, reduces prostate inflammation and other inflammatory conditions, reduces diabetic retinopathy and neuropathy, improves circulation and enhances cell vitality ... " [and, according to this site, cures almost anything else that might ail you!]

"Sage and bee pollen nourish the brain."

"Soybean lecithin has been found to clean out veins and arteries--dissolve the goeey sludge cholesterol--and thus increase circulation, relieve heart, vein and artery problems. It has cured many diabetics--cured brain clots, strokes, paralyzed legs, hands and arms!"

Take the time to browse your local health-food or vitamin store's shelves, and you'll probably spot a number of products that are deceptively advertised. Some companies try to deceive you with "sound-alike" names, packaging that mimics other products, or suggestive names that hint at cures. Other colorful bottles of pills contain substances that can't actually be absorbed by the body in oral form--for example, "DNA" (deoxyribonucleic acid, the building block of human genetic



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material) graces the shelves of some shops. One site for a manufacturer of this useless "supplement" claims that "it is the key element in the reprogramming and stimulation of lazy cells to avoid, improve, or correct problems in the respiratory, digestive, nervous, or glandular systems." It also notes that this "DNA" is extracted from fetal cells. Other brands are apparently nothing but capsules of brewer's yeast.

As the previous section on vitamins and supplements indicates, some other supplements provide end products of internal procedures, such as glutathione, instead of the precursors needed for the body to make a sufficient supply on its own, such as vitamin E. This approach may not work. When in doubt, consult with your doctor or a competent nutritionist.

How can you assess supplement claims? Start by relying primarily on reputable reference books for your basic information, rather than on advertisements or the popular press. Watch out for any product whose salespeople claim it will "cure" anything. Supplements and vitamins may enhance health and promote wellness, but they rarely effect cures. Be wary of universal usefulness claims. The worst offenders in supplement advertising tout their wares as cure-alls for a multitude of unrelated conditions in an effort to make the most sales.

There are a few other sales pitches that should make you wary. If a product's literature references the myth of the long-lived Hunzas, someone's trying to pull the wool over your eyes. This tale of hardy Russian mountain folk who supposedly all live to be well over 100 years old was refuted long ago by reputable researchers. If it's a natural substance but a particular company claims to be the only one to know the secret of its usefulness, that really doesn't make much sense. Be especially cautious when sales pitches are written in pseudoscientific language that doesn't hold up under close examination with a dictionary. This is a popular ploy. For example, one product that has occasionally been peddled to parents of children with PDDs claims to "support cellular communication through a dietary supplement of monosaccharides needed for glycoconjugate synthesis." Translated into plain English, this product is a sugar pill.

Even when you have seen the science behind a vitamin or supplement treatment, there's still the problem of quality and purity. It's almost impossible for consumers to know for sure that a tablet or powder contains the substances advertised at the strength and purity promised. Whenever possible, do business with reputable manufacturers that back up their products with potency guarantees or standards. In most European countries, potency is governed by government standards; in the US, it's a matter of corporate choice.

"Natural" does not mean "harmless." Vitamins and supplements can have the power to heal, and the power to harm. Be sure to work closely with your physician or a nutritionist if you're using anything more complex than a daily multivitamin.

Notes:

1. Dr. Rosemary Waring, "Biochemical Parameters in Autistic Subgroups," October 1995 presentation to 4th Consensus Conference on Biological Basis and Clinical Perspectives in Autism, Troina, Sicily, based on ongoing studies at the University of Birmingham (UK) Biochemistry Department.

2. Dr. Robert J. Sinaiko, "The Biochemistry of Attentional/Behavioral Problems," presentation to the 1996 Feingold Association Conference (<http://www.feingold.org/sinaiko.shtml>).

3. R. S. Chamberlain and B. H. Herman, "A Novel Biochemical Model Linking Dysfunction in the Brain, Melatonin, Proopiomelanocortin Peptides, and Serotonin in Autism," *Biological Psychiatry* 28 (1990): 773-793.

4. M. Fux et al., "Inositol Treatment of Obsessive-Compulsive Disorder," *American Journal of Psychiatry* 153 (1996): 1219-1221.



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5.J. Levine, "Controlled Trials of Inositol in Psychiatry," *European Neuropsychopharmacology* 7 (May 1997): 147-155.

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