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How to Help Heal Mental Disorders with Nutrition

Analysis by Dr. Joseph Mercola | July 05, 2026

STORY AT-A-GLANCE

- Biochemist William Walsh has spent decades researching how nutrient imbalances affect brain chemistry and mental health, building one of the world's largest chemistry databases for autism, depression, and behavior disorders
- Approximately 70% of people with mental disorders have a methylation imbalance — either undermethylation (22% of the population) or overmethylation (8%) — and each condition requires completely different nutritional treatment
- There are four biochemical types of violent people. Many have severe zinc deficiency, pyrrole disorder, low blood spermine and methylation defects — an unusual combination of bad biochemistry
- While there are hundreds of nutrients that are important for health, in the brain, six or seven dominate. These are nutrients that are either involved in synthesis or functioning of neurotransmitters
- Nutrients that have a powerful influence on mental health include zinc, copper, B6, selenium, folates, and S-adenosylmethionine (SAMe)

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Can you use specific nutrients to improve your mental health? Yes, you can. William Walsh, Ph.D., president of the nonprofit Walsh Research Institute in Naperville, Illinois, and author of "Nutrient Power: Heal Your Biochemistry and Heal Your Brain," specializes in nutrient-based psychiatry and nutritional medicine.

He and I are both fellows of the American College of Nutrition. He's designed nutritional programs for Olympic athletes, NBA players and major league baseball players. More importantly, he's spent a great deal of his career seeking to improve mental health through nutrition.

> *"I started off in the hard science. I was an experimentalist,"* Walsh says. *"I worked, in the beginning, in the nuclear field … with places like Los Alamos, the Institute for Atomic Research and University of Michigan Research Institute. I wound up at Argonne National Laboratory. While working as a scientist there, I started a volunteer project at the local prison, Stateville Penitentiary.*
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> *I eventually got really interested in why people were violent … [W]hen we started the ex-offender program, I got to meet the families that had produced a criminal. I found some wonderful families, caring and capable families, that have other children who turned out just fine …*
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> *I began to realize we didn't understand why people had bad behavior. We then asked the question, 'Could it be something related to their brain chemistry or the body chemistry?' … I started doing lab studies of their blood, their urine and hair. I found out that they were very, very different from the rest of the population. That's how I got started."*

Biochemistry and the Criminal Brain

Walsh received valuable direction after meeting Dr. Carl Pfeiffer, who was doing work on heavy metals and schizophrenia. As it turns out, levels of metals, including copper, zinc, and manganese, were all abnormal in criminals compared to the general population.

Walsh discovered four biochemical types of violent people. One of these was the sociopaths, all of whom had severe zinc deficiency, pyrrole disorder, low blood spermine, and undermethylation. In all, it's an unusual combination of bad biochemistry. A collaborative investigation with Pfeiffer resulted in nutrient therapies for each of the behavior types.

Pyrrole disorder is a stress condition commonly found in brain disorders. A urine test developed by niacin expert Abram Hoffer and Pfeiffer is the gold standard test for this genetic condition, which involves altered biochemistry in your bone marrow and spleen.

People who have pyrrole disorder may produce five to 10 times more pyrrole than normal — a byproduct of natural reactions, like the formation of hemoglobin. While harmless in and of itself, pyrrole bind to and draw out anything that is an aldehyde, such as B6. It also sharply depletes zinc.

As a result, people with pyrrole disorder have exceptionally low levels of B6, and zinc which can have serious effects on brain function, affecting their memory, and ability to read, for example. B6 deficiency is quite common among children with attention deficit hyperactivity disorder (ADHD) as well.

The Earlier the Treatment the Better the Results

> *"Eventually, [Pfeiffer] and I jointly evaluated 500 patients, mostly violent adults and violent children. We got our best results with the kids, young people with the same kind of chemistry, who were mostly very violent,"* Walsh says.
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> *"I have to say we didn't really succeed in finding a way to help the adult criminals. They would get better for six to eight months, and then I'd find out they were back in prison. That had a lot to do with the fact that they were abusing alcohol and illegal drugs … At about 1990, we decided to focus on children …*
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> *It's been very successful. If we can get a child before their lives are ruined, before they pass puberty perhaps, our success rate [is] very high … The doctors report a striking improvement in behavior.*
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> *Most of these kids, of course, [are] on drugs, everything from Ritalin to powerful antipsychotic medications. Usually when we're finished and [have] balanced their chemistry, they can wean off the medication. They usually are fine without*

it …"

Nutrients Involved in Synthesis or Functioning of Neurotransmitters Dictate Mental Function

Later on, Walsh expanded to also include children with autism and ADHD. Fond of numbers, Walsh began amassing enormous databases. At present, he has one of the world's largest chemistry database for autism, depression, and behavior disorders.

> *"When you look at these millions of chemical analyses of blood, urine and tissues, it's obvious that there are very great differences,"* he says. *"I found that for mental disorders, about six or seven chemical imbalances dominate mental function. There are hundreds and hundreds of important nutrients in the body, but in the brain, there are about six or seven that [seem] to dominate everything. Eventually, I found out why …*
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> *[T]hese are the nutrient factors that are either involved in synthesis of a neurotransmitter or the functioning of a neurotransmitter. They include methylation — undermethylation or overmethylation. In our database, 70% of all humans in the United States have normal, typical methylation; 22% are undermethylated … 8% are overmethylated.*
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> *About 70% of all people who have a mental disorder have one of these methylation disorders. The symptoms are completely different, and the treatment they need is completely different. We also found that most people [who have mental disorders] are depleted or deficient in zinc. That's the most common [deficiency] we see … Virtually everyone with a mental disorder seems to need zinc and improve on it."*

Copper Overload Linked to Autism, Schizophrenia, and Postpartum Depression

Copper is another important trace metal, as it plays a distinct role in the synthesis of norepinephrine, a major neurotransmitter. Divalent copper (Cu2+) is a dramatic factor in the ratio of dopamine and norepinephrine.

Animal studies have shown that when animals are starved of copper until they only have 25% of the normal amount of copper in their blood, the ratio between norepinephrine and dopamine is changed by more than a factor of three. Most of us have the ability to homeostatically control copper. However, some do not have that ability.

> *"It all has to do with an enzyme called metallothionein that is genetically expressed. Some people don't have that system working,"* Walsh explains. *"These persons have copper overload, which we find virtually in every autistic patient, most patients with schizophrenia and almost everyone with postpartum depression.*
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> *That's a recipe for very high norepinephrine — which means anxiety and depression — and low dopamine (a feel-good neurotransmitter), which is a hallmark of ADHD … a nasty combination.*
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> *We find the sociopaths innately have low copper levels. People who have undermethylation tend to have low normal copper levels … The good news for mental disorders is that there are more than 100 really important biochemicals in the body, but only a few dominate mental disorders.*
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> *If we had to do lab testing for 100 of them, it would be really difficult. If we had to adjust the levels of these and normalize 100 different factors, it would make life very difficult. But we found that by just focusing on maybe seven or eight nutrient factors, we could help 95% of the patients we see with nutrient therapy."*

How to Measure Your Zinc and Copper Status

Zinc experts typically agree that plasma zinc provides the most accurate measurement. The taste test has some minor value but is among the least reliable. To accurately measure copper, serum copper is the way to go, and most labs throughout the world provide good copper assays.

Walsh recommends doing a ceruloplasmin test at the same time, because then you can determine how much free radical copper you have, which gives you a good indication of your level of oxidative stress. A high sensitivity C-reactive protein (CRP) test would also be useful as a marker of inflammation.

> *"By the way, oxidative stress runs through every single mental disorder we see, without exception,"* Walsh says. *"Every one of them seems to have extraordinary oxidative stress — schizophrenia, bipolar disorder, a violent child or an autistic child."*

Unfortunately, our modern lifestyle strongly promotes oxidative stress, with processed foods, processed vegetable oils, excessive net carbs, and excessive protein being some of the most potent factors. This kind of diet causes a reduction in ketones and a radical increase in reactive oxygen species and secondary free radicals.

Exposure to nonnative electromagnetic fields, glyphosate, and other pesticides, fluoride-contaminated water and other toxic exposures only add to the problem. Typically, copper and ceruloplasmin levels tend to go hand in hand, being either high or low together.

The ideal level for copper, with respect to mental health, is somewhere between 75 and 100 micrograms per deciliter (mcg/dL) in serum. The ideal amount of ceruloplasmin has to do with whatever your level of copper is.

Ideally, the percentage of copper in your ceruloplasmin should be around 85% to 90%. "It's really great to do both simultaneously, because then you have a really good picture of not only the copper situation, but also the level of oxidative stress," Walsh says.

The Importance of Methylation in Mental Health

Walsh was among the first people to alert the world to the importance of methylation in mental health, especially autism. The No. 1 causes of undermethylation are single-nucleotide polymorphisms (SNPs) or mutations in the enzymes for the one-carbon cycle (the methylation cycle).

> *"The No. 1 factor is the methylenetetrahydrofolate reductase (MTHFR), which is one of the enzymes. That's the rate-limiting step for that whole cycle, for most people,"* Walsh explains. *"Genetic testing services such as 23andMe can provide this kind of information.*
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> *However, most human beings have enormous numbers of SNPs. They've already found 10 million snips (or mutations) in the human genome. Every human being has thousands of these SNPs. A really high percentage of people have even the more serious MTHFR SNPs — the C677T, the A1298C that people are always talking about.*
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> *The thing that is often mistaken by nutritional scientists is that if a person has the homozygous, the double copies of the C677T, it doesn't necessarily mean they're undermethylated. It certainly doesn't mean that they will benefit if you give them methylfolate. That's one of the problems that we're finding.*
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> *The reason is epigenetics. You have to consider the epigenetics and the methylation at the same time. There are three nutrient factors that affect epigenetics more than anything else: folates, methionine and S-adenosylmethionine (SAMe). These have a really powerful impact on epigenetics."*

How Folates Affect Epigenetics

Folates are serotonin reuptake promoters. However, even if an individual is undermethylated and has a problem related to low serotonin activity, such as depression or anxiety, folates should not be given, Walsh warns. The reason? If you give folate, their methylation will improve and the patient will actually get worse.

The reason for this worsening is because, epigenetically, folates act as deacetylase inhibitors and sharply lower serotonin activity. Most autistic individuals will not have a serotonin problem and will thrive on methyl folate. However, an estimated 10% of autistic children and adults do have a serotonin issue and will severely regress if given methyl folate.

> *"We've had thousands of patients who were undermethylated depressives. I've seen more than 3,000 cases of clinical depression. I've got this huge database. The largest phenotype … is undermethylation.*
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> *But if you gave them any form of folate, they would get worse. Their methylation would improve, they would get worse, because it has a dramatic impact on serotonin reuptake. In contrast, methionine and SAMe are natural serotonin reuptake inhibitors.*
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> *They do essentially the same thing that Prozac and Paxil do. Folates have the opposite effect. Folates are wonderful if you want to knock dopamine level down in schizophrenics or people who have high anxiety — overmethylated people. It's counterintuitive because folates are excellent methylating agents."*

To reiterate, some undermethylated people are intolerant to folates, and some overmethylated people thrive on folates even though folates improve methylation. As you can see, there are epigenetic complexities involved here, making self-diagnosis and self-treatment highly inadvisable.

It could be quite risky to take these bits and pieces of information and try to apply them on your own. There are simply too many variables. So, the bottom line here is to make sure you're being treated by a knowledgeable professional.

Heavy Metals and the Autistic Brain

Walsh has tested 6,500 autistic patients. As a group, they have much higher toxic metal levels than their siblings or the general population. Walsh believes their toxic burden is likely due to an inborn predisposition that makes them more likely to accumulate toxins and/or vulnerable to the effects of toxins.

> *"Thousands of these parents, maybe more than half, told a very sad story of how they had a child who was developing normally, was beginning to speak and was singing and charming their grandparents. Then maybe the child got sick.*
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> *They took him to a pediatrician and the pediatrician — I've heard this story hundreds of times — said, 'Oh, you're behind on your shots. You're behind on your vaccinations.' They took a sick child and gave them multiple vaccinations, at that time, with thimerosal and mercury.*
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> *Hundreds of these families said that within a day or two, their child changed forever. Lost all speech, the personality changed, they became sick. They became intolerant to served foods. They were just very troubled little human beings.*
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> *When they went to specialists, eventually they wound up with the diagnosis of autism and were told that it was incurable and that there was no hope really for recovery. We've seen a lot of human misery just talking with these families. It's just a shocking and terrible thing."*

Walsh suspects autistic children have an insufficiency of natural antioxidants such as glutathione and metallothionein, rendering them more vulnerable to the effects of environmental exposures, including vaccines and poor diet. It's worth noting that 1 in 3 children diagnosed with autism does not have true autism caused by epigenetic variations.

Many of these children have a good chance of recovery, whereas classic Kanner autism is a permanent, life-long epigenetic condition (named after Leo Kanner, who discovered autism in the 1940s[1]), although some measure of improvement can be made even in these cases.

On Thimerosal

Walsh has also investigated the thimerosal issue, looking for evidence of mercury toxicity in the brains of autistic children. In fact, he was the first person to actually measure mercury in autistic brains.

He was able to receive brain tissue samples from Johns Hopkins, and using the Argonne facility called the Advanced Photon Source, he did over 1 million chemical analyses on brain tissue from autistic and non-autistic children. Every autistic child analyzed had received thimerosal-containing vaccinations.

However, no mercury could be found in the brain tissue. One explanation for this is that the tests were done years after the vaccinations. The half-life of mercury in the human body is 42 days. The half-life of ethyl or methyl mercury in the brain is 70 days.

> *"I think what it amounts to is that mercury is a terrible poison. It's a terrible insult,"* he says. *"I think these vulnerable kids should never be exposed to it. However, it doesn't stay in the body and it doesn't do continuing damage. I think after a year or so, it has left the body, even though there are tens of thousands of families who are trying therapies that will take the mercury out of their child's brain when it's no longer there."*

Metallothionein Promotion Nutrient Therapy for Autism

The fact that autistic children tend to have extraordinary copper and zinc imbalances means their metallothionein protein is not functioning. Metallothionein is required for homeostatic control of copper and zinc. Walsh has developed a metallothionein promotion nutrient therapy: a formulation of 22 nutrients known to enhance genetic expression and function of metallothionein. This protocol has been used on more than 2,000 autistic patients, with measurable improvements in outcome.

> *"The most important antioxidants in the brain are somewhat different than the rest of the body. I call them the three musketeers. It's glutathione, metallothionein and selenium. It's specific to the brain,"* he explains.

Technically, selenium is not an antioxidant per se, but it does increase glutathione levels and enhances the function of metallothionein and, in the brain, glutathione and metallothionein work together. Glutathione is your first line of defense. The problem is, autistic children typically have a poor diet (it's hard to get them to eat anything) and with the oxidative overload, they quickly run out of glutathione. When you run low on glutathione in your brain, your metallothionein level increases.

> *"Metallothionein doesn't work unless you have oxidized glutathione. It's a hand in glove situation. It's the backup system for glutathione in the brain, and we know that without selenium, that whole system doesn't work well,"* Walsh explains.

I take selenium every day. It's a trace mineral, so you don't need much, up to about 200 mcg per day, and you definitely need to be mindful not to overdose. As noted by Walsh, of all the trace metals, selenium has the narrowest division between deficiency and overload, so you need to be careful when supplementing.

Zinc also needs to be normalized, as it is the No. 1 factor for enabling metallothionein to function and support glutathione. According to Walsh, for mental and physical health, you need a plasma zinc level between 90 and 130 mcg/dL. Many mental patients have a genetic weakness in zinc normalization; they're born with zinc deficiency, and need far higher amounts than typical to maintain a healthy zinc level.

Changing the Face of Psychiatry

Walsh is convinced the use of psychiatric medication will eventually fade away as we learn more about normalizing brain function through nutritional interventions. "These powerful drugs … they do not normalize the brain. They cause an abnormal condition," he

warns. "They might correct depression or anxiety, but you wind up with something that's not normal."

The Walsh Research Institute is a public charity with no financial interests, and they are slowly but surely helping to change mainstream psychiatry. Walsh has given talks at the highest levels, including the Surgeon General's office, the U.S. Senate and the National Institutes of Health (NIH). He's also spoken at American Psychiatric Association (APA) annual meetings several times.

> *"The last time I went there, they finally listened to me … I was there about two and a half years ago. I gave an invited talk on depression. I basically explained to them they're doing depression wrong.*
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> *They actually listened to me. I showed them our huge chemistry database and explained that depression is a name given to at least five completely different disorders, each involving different symptoms and each involving different neurotransmitters that are malfunctioning.*
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> *Then I described each one of these biotypes and actually showed them that if they would simply do some inexpensive blood and urine testing, they could identify which people would be good candidates for selective serotonin reuptake inhibitors (SSRIs) or which ones would do better on benzodiazepine, but even more importantly, how they can correct it with nutrients."*

There were 17,000 psychiatrists at this meeting from all over the world, and Walsh was 1 of 4 speakers at a well-attended session. Afterward, there was tremendous demand for more information, which gives hope. Walsh also offers a training program for doctors. In the U.S., 45 psychiatrists went through the program last year. In all, 500 physicians and psychiatrists in 32 countries have taken his program so far.

Why SSRIs Induce Violence

One major problem with SSRI antidepressants is the risk of self-harm and aggression as a side effect. Overmethylated, low-folate depressors are intolerant to SSRIs, and evidence suggests this genetic intolerance may have been a factor in many school shootings. Walsh, who has studied this phenomenon, notes 42 of the 50 major school shootings in the U.S. since 1990 were done by teens or young adults taking an SSRI.

> *"I discussed this … before the APA … I tried to explain to them that they … can do a blood test; they can find out which children or which adults are more likely to become violent if they get an SSRI. I've written about this several times; published it in magazines …*
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> *If you buy Prozac or Paxil, the insert inside warns that some people … are prone to suicidal or homicidal behavior. We now know which ones they are!"*

More Information

To learn more, visit www.WalshInstitute.org. There you can also purchase Walsh's book, "Nutrient Power: Heal Your Biochemistry and Heal Your Brain." Questions and information requests can be sent to **Dana@WalshInstitute.org**, or you can call (630) 506-5066.

> *"Our website has a resources section that recommends quality labs, compounding pharmacies and a list of doctors who we've trained, who are now able to do this kind of therapy,"* Walsh says.

Sources and References

- [1] Leo Kanner's 1943 Paper on Autism