

## Nutrient Therapy to Balance Brain Chemistry: The Walsh Protocol



Mental health disorders are among the most common health conditions in the United States. More than 50% of Americans will be diagnosed with a mental illness or disorder at some point in their lifetime. And, 1 in 25 people live with a serious mental illness, such as schizophrenia, bipolar disorder, or major depression. As the rate of mental health disorders continue to rise, especially among adolescents and young adults, there is an urgent need for improvements in our treatment approach. Relying on psychopharmaceutical medications to treat mental illness is wrought with limitations, involves a lot of trial and error, and can have severe risks and side effects.

Advancements in the understanding of how nutrient imbalances impact neurotransmitter levels and gene expression have led to a powerful new framework for treating mental disorders in both pediatric and adult patients. This paradigm shift, largely created by the ongoing work of Dr. William Walsh, PhD, involves assessing one's unique biochemistry and identifying imbalances and creating an individualized nutrient therapy plan using amino acids, vitamins, and minerals.

Nutrients provide the necessary raw materials to support neurotransmitter synthesis, epigenetic regulation of neurotransmitter activity, and protection against oxidative stress. They safely and effectively can correct underlying biochemical imbalances, which is the key to optimal health and wellness. This approach represents a major breakthrough in finding biological explanations for problems like depression and anxiety that can sometimes be challenging to diagnose and treat.

Our innate biochemistry influences our personality, behavior, mental health, immune function, allergic tendencies, etc. It also sets the stage for the diversity in our nutritional needs. Genetic differences in the way our bodies process foods creates deficiencies in certain nutrients and an overload in others. Having the proper balance of nutrients plays a very important role in health, and is especially true for individuals with mental health problems.

In his groundbreaking book, *Nutrient Power*, Dr. Walsh, details his 35 years of evaluating and treating biochemical imbalances in 30,000 patients with conditions ranging from autism to schizophrenia to Alzheimer's. Dr. Walsh explains the key factors that result in neurotransmitter imbalance and presents the basic strategies needed to successfully correct these imbalances. His work uses only nutrients, and as a result of his rigorous research and understanding of brain and human biochemistry, these nutrients can correct the neurotransmitter imbalances that contribute to most mental health conditions. Dr. Walsh has found that most neurotransmitter problems appear to be genetic or epigenetic in nature and involve abnormal absorption, metabolism or storage of key nutrients.

Dr. Walsh has identified the key nutrient imbalances that dominate mental illnesses that can be measured through the following tests: **whole blood histamine**, **plasma zinc**, **serum copper**, and **urinary kryptopyrrole** (Village Green's [Brain Chemistry Panel](#)). Based on Dr. Walsh's research, these tests are paving the way for nutrient-based psychiatry and nutritional medicine.

### **Whole Blood Histamine: A Marker for Methylation**

Whole blood histamine levels are a marker for methylation, a critical biochemical pathway necessary for the production of neurotransmitters such as serotonin, dopamine, norepinephrine and epinephrine. Genetic abnormalities in methylation can result in either the overproduction or underproduction of these important brain neurotransmitters. People that overproduce neurotransmitters (over-methylators) often have high anxiety, panic disorders, and chemical sensitivities. Individuals who under-produce neurotransmitters (under-methylators) often exhibit depression, compulsive behaviors, and perfectionism.

Histamine and methyl groups are present in measurable levels throughout the body, and an inverse relationship exists between them. Histamine is metabolized by methylation, and this is a primary

mechanism for regulating histamine concentrations. Elevated blood histamine indicates undermethylation, and low histamine is evidence of overmethylation.

### **A Closer Look at Methylation**

This is a process where a carbon group is added to a substance in the body. We are methylating substances millions of times per second and we have around 100 genes in our DNA that code for various methylation pathways. Methylation relates to brain biochemistry in several ways. It is a critical step necessary in the production of our neurotransmitters that dictate mood, including serotonin, dopamine, norepinephrine and epinephrine. Impaired methylation in a person can result in the under-production of these important brain neurotransmitters, therefore shifting the neurochemistry in the brain.

Methylation plays another, likely more significant role in brain neurotransmitter balance. Scientific research clearly shows that it influences the way in which our DNA strands are read and expressed. Traits of DNA are only expressed when that section of DNA is read by a messenger RNA, which then coordinates the production of the corresponding protein. The resultant protein created from reading the instructions on the DNA then influences the expression of that portion of the gene in the body. The DNA provides the instructions, the messenger RNA decodes it, and the protein carries out the action. Methylation can significantly impact the reading of our DNA. People who are undermethylated due to genetic predispositions that reduce methylation pathways tend to over-express areas of the DNA. People who are overmethylated tend to read less of their DNA because the carbon groups associated with methylation essentially covers the DNA and prevents it from being read by the messenger RNA. What most people don't know is that our optimal health requires the perfect balance between expressing genes and suppressing genes. It is just as important to suppress certain genes as it is to express others. In the case of mood disorders, one way that overmethylation and undermethylation relate specifically to brain chemistry has to do with neurotransmitter transporters. These are channels in our presynaptic brain neurons that re-uptake neurotransmitters, like serotonin and dopamine after they bind to target receptor sites. The entire basis of the current pharmaceutical approach to managing mood disorders works directly on the principle of manipulating re-uptake channels. SSRIs, the most commonly prescribed drug for mood disorders, stand for **Selective Serotonin Reuptake Inhibitors** and target these channels to block the re-uptake of serotonin. This in turn increases the interactions between serotonin and the target receptor in the area of the brain where serotonin is the most active. Other classes of medications also target the re-uptake of dopamine and norepinephrine. Conversely to the idea of just indiscriminately blocking re-uptake pathways, Dr. Walsh's research shows us that by using nutrients, we can balance re-uptake channel production by covering or uncovering the DNA strands that code for those channels using nutrients that influence methylation.

What is of the utmost importance is that before any therapy is initiated, we first test to find out if a person is undermethylated (produces too many re-uptake channels and therefore has low serotonin in the area of the brain where it is most active) or is overmethylated (under-produces re-uptake channels and therefore has too much serotonin in the brain where it is most active). As a result, each treatment is customized to an individual's unique biochemistry, which improves outcomes and reduces side effects. Dr. Walsh's research has shown that by doing this simple, evaluation of methylation, it can be predicted with a great degree of accuracy which person is likely to have a serious adverse reaction to a drug that specifically influences serotonin re-uptake channels. In fact, he has been hired by the US government to evaluate tissue samples of dozens of perpetrators of mass shootings, due to the high correlation of antidepressant use in persons who carry out these attacks. He has found very convincing biochemical links, and it is one of his missions to make this test standard in psychiatry in order to avoid putting people on a medication that can result in dangerous alterations of brain chemistry linked with a higher rate of suicidal and homicidal behavior.

### **Plasma Zinc & Serum Copper: Balancing Metal Metabolism**

Zinc has an important effect on neurotransmission and muscle development. It is **needed to produce neurotransmitters such as GABA** and has many other immune and growth functions in the body. One

of the causes of zinc deficiency comes from a genetic abnormality around metallothionein, which is a protein that controls and regulates zinc and copper levels.

More than 90% of people diagnosed with depression, behavioral disorder, ADHD, autism and schizophrenia exhibit depleted zinc levels. Zinc deficiency has been associated with delayed growth, temper control problems, poor immune function, depression, poor wound healing, epilepsy, anxiety, neurodegenerative disorders, hormone imbalances and learning problems.

Zinc and copper imbalances indicate a problem with metal metabolism, which is often inherited, and directly impacts the production of several neurotransmitters.

Elevated copper levels can alter brain function, specifically by lowering dopamine levels and raising norepinephrine levels. Imbalances in these essential brain chemicals have been related to paranoid schizophrenia, bi-polar disorder, postpartum depression, ADD, ADHD, autism, and violent aggressive behavior. Elevated copper levels are known to cause zinc levels to deplete and oxidative stress to rise.

**Dysfunctional copper regulation is now known to be one of the leading causes of postpartum depression.** During pregnancy, the mother's copper level will more than double to compensate for the fetus. In normal cases, the mother is able to bring her copper levels back down, but when she can't, this can result in postpartum depression.

### **A Closer Look at Metal Metabolism**

In the context of Dr. Walsh's research, metal metabolism refers more specifically to the balance of zinc and copper in the body. Each of these metals plays a critical role in brain chemistry balance.

Zinc is one of the most critical nutrient cofactors needed for the production of brain neurotransmitters. Without it, the enzymes that convert amino acids into active brain chemicals cannot carry out their task. Zinc deficiency can be quite common in the general population due to the amount of highly processed food typically consumed in the developed world. A simple blood test is all it takes to evaluate for low zinc levels.

Copper imbalances can alter brain chemistry in several ways. Most issues related to copper and brain chemistry alterations are related to elevated copper levels. The vast majority of people who have elevated copper levels have it due to genetic factors, not from ingestion of copper from the food or water supply, although consumption of high-copper foods and drinks can make the problem worse.

Copper is one of the most well known electrical conductors on earth. Our brain is a highly electrical organ, and elevated concentrations of copper in the blood and brain can alter the electrical impulses associated with brain activity. This can sometimes lead to states of over-excitation in the brain, and metal metabolism issues are often observed in ADHD and behavior disorders.

Of other concern is the role copper plays in the conversion of neurotransmitters. Specifically, it facilitates the conversion of dopamine to norepinephrine. Dopamine is a neurotransmitter associated with the feeling of pleasure or reward. It is triggered by love, relaxation and rewarding behavior that brings pleasure. Norepinephrine is a highly excitatory neurotransmitter that is also a stress hormone. It is one of the primary neurotransmitters associated with the fight or flight response of our nervous system. Elevated copper levels promote the conversion of dopamine → norepinephrine, resulting in low levels of dopamine and elevated levels of norepinephrine. This particular neurotransmitter imbalance typically produces a lot of anxiety due to the high stress state related to norepinephrine and attention issues related to low dopamine. Copper elevations are commonly found in women who experience postpartum depression and significant mood alterations associated with hormonal changes like pregnancy, as well as hormonal therapies including birth control, menstruation and menopause. This is a result of estrogen's ability to trigger the body to concentrate copper. It does this because copper is a critical nutrient for the formation of new blood vessels, and developing babies need high concentrations of copper to build the hundreds of miles of blood vessels in our vascular tree.

## Urinary Kryptopyrrole: A Marker for Pyrrole Disorder

Pyrrole disorder is characterized by an elevated urine kryptopyrrole, which results in a dramatic deficiency of zinc and vitamin B6. Pyroluria, elevated pyrroles, or a high kryptopyrrole result, is frequently identified in behavior disorders, autism, Asperger's, ADHD, ADD, depression, bipolar disorders, assaultive/aggressive/violent behavior, schizophrenia and other mental and emotional conditions. Pyroluria can create poor tolerance of physical and emotional stress, poor anger control, emotional mood swings, depression, anxiety, poor short-term memory, frequent infections, inability to tan, poor dream recall, abnormal fat distribution, sensitivity to light and sound and tactile sensitivities.

### **A Closer Look at Pyrrole Disorder**

Pyroluria is a genetically acquired chemical imbalance that results in an abnormally large amount of pyrrole production. Pyrroles refer to ring structures produced in the body as a byproduct of hemoglobin synthesis. At this time, they have no known function in the body and are normally excreted in the urine, but when they are not, increased levels of pyrroles can cause major behavioral disorders. In fact, it accounts for 38% of autistic cases and 17% of depression cases.

Pyrroles have a high affinity for binding both zinc and vitamin B6. B6 is necessary for the synthesis of neurotransmitters like serotonin, dopamine, and norepinephrine, and zinc is needed to produce GABA. In people with pyroluria, the excessive concentration of these rings results in significant deficiencies of zinc and B6, as these nutrients are bound and then excreted in the urine, attached to the pyrrole.

### **In Conclusion: Benefits of Using the Walsh Protocol**

By carefully evaluating a person's individual biochemistry using simple blood and urine tests, such as Village Green's [Brain Chemistry Panel](#), a properly trained health provider can begin to see what patterns are contributing to their mood imbalance. A customized nutrient program is then initiated based on their unique biochemistry. Some people with mood disorders may have abnormalities in all areas, while other people might only have an imbalance in one. The important point is that identifying the specific abnormalities allows for better, more focused treatment options, which results in improved outcomes and fewer side effects.

The nutrient therapies involved in correcting these issues are considered safe to use with most prescription medications for mood disorders. This allows for a very safe, gradually reduced dependency on the medication while the nutrient therapies have time to balance the biochemistry. For example, regulating methylation may take a minimum of 3 months and maximum time frame of 6 months for full benefits. In some cases, prescription medications may continue to provide added benefits to the nutrient therapies, in which case both can be continued indefinitely.

At this time, there is no other non-drug treatment strategy as well researched and documented through case studies as the one developed by Dr. Walsh and his 35 years of research. Even many prescription therapies for mood disorders are considered to be not much more effective than placebo. This starts to make sense when you consider the many factors that can contribute to biochemical imbalances that predispose someone to a mood issue, yet prescription drugs typically only target one imbalance. Again, understanding individual biochemistry and genetics allows for tailored treatments, which often yield better results with fewer side effects.

### **For more information on ordering lab testing for the Walsh Protocol:**

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