

Diagnosing the Root Causes of Illness with the Organic Acids Test

We often talk about the human body as though it is a machine assembled with various components – brain, heart, lungs, stomach, liver, kidneys, skin, bones, and so on. In some ways, the body does function like a machine, but unlike a machine. the body is organic. Every human body is a living organism consisting of approximately 30 trillion cells plus about 100 trillion microbes, most of which live in the gut (you couldn't live without these microorganisms).

Your health basically boils down to how well these approximately 130 trillion cells function alone and together. Each cell is a living entity, consuming nutrients from food, converting those nutrients into energy, carrying out specialized functions, and even cloning their own replacements. Healthy cells make a healthy body.



Why Take the Organic Acids Test?

- Understand vitamin and hormone **metabolism**
- Determine capacity to **generate energy**
- Evaluate **intestinal wall** integrity
- Assess performance of the **central nervous system**
- Evaluate **muscle function**
- Reveal excessive levels of **gastrointestinal (GI) yeast**
- Reveal excessive levels of **GI bacteria**
- Detect **nutritional** or **antioxidant deficiencies**
- Determine problems in **fatty acid metabolism**
- Identify **oxalate** imbalances



The waste products that cells produce daily are eventually expelled from the body. The chemicals included in these waste products provide valuable clues for tracking down the underlying causes of many health conditions. Urine alone contains more than 1,000 organic acids that can be analyzed to identify causes of behavior and movement disorders, hyperactivity, chronic fatigue, immune dysfunction, and many other disorders and dysfunctions.

What Are Organic Acids?

Organic acids – which is the focus of this post – are chemical compounds that are products of metabolism and are excreted in

the urine of mammals. *Metabolism* is the set of life-sustaining chemical reactions responsible for the following:

- Converting food to energy to fuel cellular processes
- Converting food to building blocks for proteins, fats, and other organic chemical molecules the body needs
- Eliminating metabolic waste products

The names of most organic acids consist of two words, the first ending in *-ic* and the second word being *acid*. You've probably heard of many common organic acids, including *lactic acid* (which makes yogurt tart) and *citric acid* (from citrus fruits such as oranges and lemons).

Organic Acid Testing

Here at BioDesign Wellness Center, we sometimes order an organic acid test (OAT) and/or a Microbial Organic Acids Test (MOAT) from Great Plains Laboratory. These tests, which are the standard bearer for their category, screen for numerous illnesses and to identify the underlying cause(s) of certain illnesses. OAT results serve as a comprehensive metabolic snapshot of a patient's overall health, providing 76 markers that we can examine for signs of disease. MOAT results are included in the full OAT and indicates the presence of dysbiosis.

The OAT is a simple, non-invasive, at-home urine test that provides a great deal of information and insight into a patient's health. Why test urine? Because organic acids are often present in urine at 100 times their concentration in blood. The number of organic acids found in urine is enormous – more than 1,000 different organic acids since this kind of testing started.

What Are We Looking for with the OAT?

The OAT looks at *biomarkers* (indicators of disease) from various metabolic pathways to identify issues related to metabolic dysfunction. Abnormal concentrations of organic acids may result from micronutrient insufficiencies, toxin exposure, neuroendocrine activity, enzyme deficiencies, or the overgrowth of certain bacteria or fungi in the intestines.

OAT helps us identify various *organic acidemias* – inheritable genetic metabolic disorders involving a defect in protein metabolism that causes an abnormal buildup of toxic compounds in the body. This buildup of toxins upsets multiple biochemical pathways within cells including glucose catabolism (glycolysis), glucose synthesis (gluconeogenesis), amino acid and ammonia metabolism, purine and pyrimidine metabolism, and fat metabolism.

More than 50 organic acidemias exist, resulting in a range of serious health conditions, including:

- Failure to thrive
- Intellectual development disorders
- Hypo- or hyperglycemia
- Encephalopathy
- Lethargy
- Hyperactivity
- Seizures
- Dermatitis
- Dysmorphic facial features
- Microcephaly or macrocephaly
- Anemia and/or immune deficiency with frequent infections
- Ketosis and/or lactic acidosis
- Hearing, speech, or visual impairment
- Peripheral neuropathy
- Sudden cardiorespiratory arrest
- Nausea

- Coma

Many organic acidemias are associated with slight to marked increases in plasma ammonia. Some organic acidemias may be chronic and present in the first few days of life.

Many other *not genetic factors* can also alter human metabolism resulting in abnormal organic acid levels. Toxic amounts of the drug acetaminophen and other toxic chemicals can use up a key molecule, glutathione, that helps the body detoxify, leading to the overproduction of pyroglutamic acid. Tumors of the adrenal gland called *pheochromocytomas* can cause the overproduction of the neurotransmitter epinephrine, resulting in marked increases in its metabolite, vanillylmandelic acid (VMA). Genetic diseases of the mitochondria, the cell's energy source, as well as toxic chemicals that disrupt mitochondrial function cause elevation of succinic acid.

OAT results also provide us with insight into the following:

- Insufficiencies of minerals and critical vitamins such as vitamin B12, pantothenic acid, biotin, and others
- Amino acid insufficiencies, such as carnitine and N-acetyl cysteine (NAC)
- Oxidative damage and antioxidant insufficiencies
- Neurotransmitter metabolites, which can help assess central nervous system (CNS) function
- Mitochondrial energy production
- Detoxification sufficiency
- Methylation sufficiency (which ensures healthy gene expression)
- Lipoic acid and CoQ10 deficiencies
- Dysbiosis (yeast or bacterial overgrowth)
- Oxalates, which are highly correlated with many chronic illnesses.

Many people with chronic illnesses and neurological disorders often excrete several abnormal organic acids in their urine. The sources of these abnormal organic acids include oral antibiotic use, high sugar diets, immune deficiencies, and acquired infections, as well as genetic factors.

The Microbial Organic Acids Test

The Microbial Organic Acids Test (MOAT), which we said above is included in the full OAT and indicates the presence of *dysbiosis* – an abnormal overgrowth of yeast and bacteria in the intestinal tract. This test reports 21 metabolites (including creatinine) such as markers for beneficial bacteria, harmful bacteria, Clostridia species, Candida species, yeast and fungal metabolites, and general markers of dysbiosis.

Abnormally high levels of certain microorganisms can cause or worsen behavior disorders, hyperactivity, movement disorders, fatigue, and immune function.

Conditions That Can Benefit from OAT

The comprehensive OAT, which includes the MOAT is an affordable test that provides extensive results to help us diagnose and treat a long list of disorders and dysfunctions, including the following:

- Accelerated aging
- Acid reflux
- Acne
- Anxiety
- Autism
- Autoimmune disorders
- Cancer
- Depression
- Dermatitis

- Eczema
- Fatigue
- Gas, bloating, and distension
- Headaches/migraines
- Inflammation
- Joint pain
- Mood changes
- Multiple chemical sensitivity (MCS)
- Nausea
- Poor blood sugar regulation
- Poor sleep
- Weight gain or inability to lose weight

The OAT is one of the best tools for diagnosing chronic health conditions and getting at the root of those conditions, especially if you have had conventional lab tests and have been told that the results are all normal.

Treatments

If abnormalities are detected using the OAT or MOAT, treatments may include supplements, such as vitamins and antioxidants; dietary modifications, such as reduced consumption of foods containing oxalates; detoxification; and other therapies.

Upon treatment, our patients have reported significant improvement such as decreased fatigue, regular bowel function, increased energy and alertness, increased concentration, improved verbal skills, less hyperactivity, and decreased abdominal pain. The OAT is strongly recommended as an initial screening test, while the MOAT is often used as a follow-up test after treatment has begun.

What to Expect

The OAT is a simple at-home test. After ordering the test,

you'll receive a kit with a urine collection cup, detailed instructions, and a box and bag with a prepaid shipping label for sending your sample back to Great Plains Laboratory. Practically speaking, you collect 10 milliliters of first-morning urine *before* consuming any food or drink.

Certain chemical compounds can increase some of the key biomarkers and give false positives, so for 48 hours before you collect the urine sample, we'll instruct you to avoid apples, grapes, raisins, pears, cranberries, and their juices. We'll also ask that you avoid arabinogalactan, Echinacea, reishi mushrooms, and ribose supplements.

Once the results of your OAT or MOAT are available, we will contact you to schedule an appointment to review those results and advise on next steps.

Disclaimer: *The information in this blog post about organic acid testing and microbial organic acids testing is provided for general informational purposes only and may not reflect current medical thinking or practices. No information contained in this post should be construed as medical advice from the medical staff at BioDesign Wellness Center, Inc., nor is this post intended to be a substitute for medical counsel on any subject matter. No reader of this post should act or refrain from acting on the basis of any information included in, or accessible through, this post without seeking the appropriate medical advice on the particular facts and circumstances at issue from a licensed medical professional in the recipient's state, country or other appropriate licensing jurisdiction.*