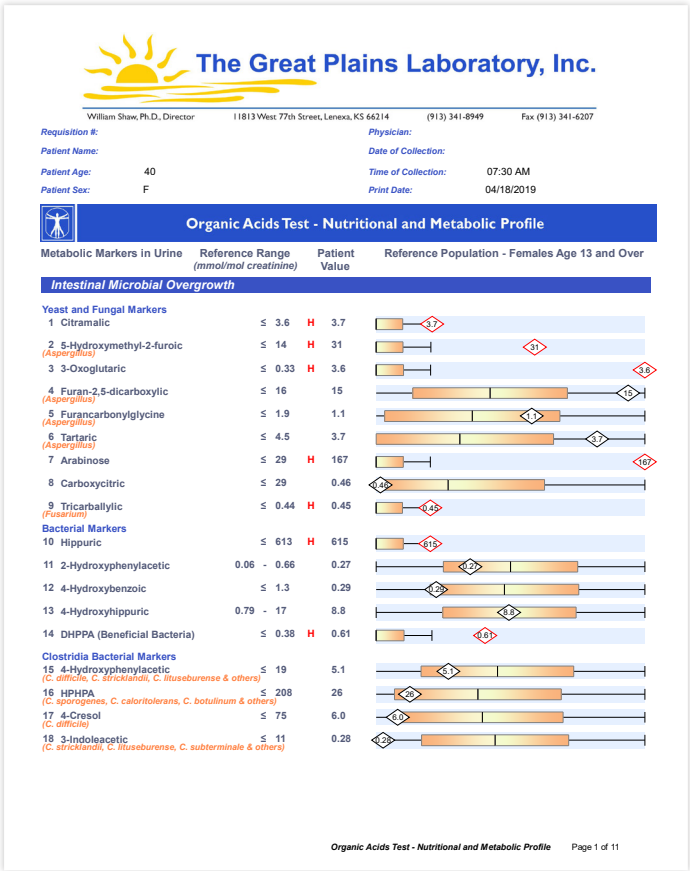
Organic Acids Test (OAT)

Nutritional and Metabolic Assessment of Overall Health

GENERAL DESCRIPTION

The Organic Acids Test (OAT) provides information about the body's biochemical balance by measuring metabolic byproducts in urine. The 76 metabolites, including creatinine, detected in the OAT can indicate vitamin and hormone metabolism, energy cycle function, intestinal wall integrity, neurotransmitter metabolites, and muscle function. Our Organic Acids Test also includes exclusive markers for HPHPA and oxalates. Specimens from individuals with a chronic illness, allergic condition, or neurological disorder often have one or more abnormal organic acids. Some organic compounds are produced by an overgrowth of gastrointestinal yeast or bacterial species due to impaired immune function, exposure to broad-spectrum antibiotics, or high consumption of simple carbohydrates. The OAT reliably detects the overgrowth of yeast and bacteria species commonly missed by conventional culture methods. These organisms and their metabolites can produce or magnify symptoms of many medical conditions. Identification of yeast or bacterial overgrowth paired with successful treatment increases the chance of recovery.

The Organic Acids Test report includes:
Markers for Krebs Cycle abnormalities, neurotransmitter levels, nutritional deficiencies, antioxidant deficiencies, yeast and Clostridia overgrowth, fatty acid metabolism, oxalate levels, and more.



The Great Plains Laboratory, Inc.

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Requisition #: Physician:
Patient Name: Date of Collection:
Patient Age: 40 Time of Collection: 07:30 AM
Patient Sex: F Print Date: 04/18/2019

Organic Acids Test - Nutritional and Metabolic Profile

Metabolic Markers in Urine	Reference Range (mmol/mol creatinine)	Patient Value	Reference Population - Females Age 13 and Over
Intestinal Microbial Overgrowth			
Yeast and Fungal Markers			
1 Citramalic	≤ 3.6 H	3.7	
2 5-Hydroxymethyl-2-furoic (Aspergillus)	≤ 14 H	31	
3 3-Oxoglutaric	≤ 0.33 H	3.6	
4 Furan-2,5-dicarboxylic (Aspergillus)	≤ 16	15	
5 Furancarbonylglycine (Aspergillus)	≤ 1.9	1.1	
6 Tartaric (Aspergillus)	≤ 4.5	3.7	
7 Arabinose	≤ 29 H	167	
8 Carboxycitric	≤ 29	0.46	
9 Tricarballylic (Fusarium)	≤ 0.44 H	0.45	
Bacterial Markers			
10 Hippuric	≤ 613 H	615	
11 2-Hydroxyphenylacetic	0.06 - 0.66	0.27	
12 4-Hydroxybenzoic	≤ 1.3	0.29	
13 4-Hydroxyhippuric	0.79 - 17	8.8	
14 DHPPA (Beneficial Bacteria)	≤ 0.38 H	0.61	
Clostridia Bacterial Markers			
15 4-Hydroxyphenylacetic (C. difficile, C. stricklandii, C. lituseburense & others)	≤ 19	5.1	
16 HPHPA (C. sporogenes, C. caloritolerans, C. botulinum & others)	≤ 208	26	
17 4-Cresol (C. difficile)	≤ 75	6.0	
18 3-Indoleacetic (C. stricklandii, C. lituseburense, C. subterminale & others)	≤ 11	0.28	

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CLINICAL USEFULNESS

- 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

SPECIMEN REQUIREMENTS

10 mL of first-morning urine before food or drink.
Patient must avoid apples, grapes (including raisins), pears, cranberries, and their juices 48 hours prior to specimen collection. Avoid arabinogalactan, echinacea, reishi mushrooms, and ribose supplements for 12 hours before collection.

REPORT ANALYSIS

Glycolysis: Elevations may result from infection, exercise, or B vitamin deficiency. Very high levels may result from genetic metabolic disorders.

Krebs cycle: Abnormalities may result from nutrient deficiencies, microbial overgrowth, or glutathione (GSH) synthesis deficiency.

2-oxoglutaric: Regeneration of amino acids to remove excess ammonia may result in low levels.

Neurotransmitters: Metabolites of dopamine, norepinephrine, adrenaline, and serotonin are measured. Abnormalities may result from stress or poor detoxification, toxic metal exposure, and rarely, specific tumors. Low levels may be associated with mood disorders or depression.

Pyrimidines: Slight elevations may occur from folic acid deficiency. Significant elevations can indicate possible genetic disorders.

Fatty acids: Elevations can result from ketogenic diets or fasting, intake of medium-chain triglycerides, carnitine deficiency, diabetes, or genetic disorders.

Toxic indicators: Abnormalities can result from a deficiency of glutathione, poor ammonia detoxification, or the ingestion of aspartame or salicylates.

Vitamin indicators: Abnormalities involving B12, B6, B5, B2, CoQ10, absorbic acid, biotin, and ascorbic acid are measured.

Amino acids: High elevations are associated with possible genetic errors in metabolism. These markers are deaminated by-products of amino acids themselves. Low levels do not indicate inadequate protein intake.

Slight elevations of valeric acid analogs may indicate a greater requirement for thiamine (B1).

> **3-Methylglutaric or 3-methylglutaconic Acid:** Elevated levels indicate reduced capacity to metabolize leucine. Small elevations may accompany impairment of mitochondrial function.
>
> **3-Hydroxyglutaric Acid:** Elevations indicate deficiency in the enzyme involved in the breakdown of lysine hydroxylysine and tryptophan.

Phosphate: Low phosphate is primarily associated with vitamin D deficiency. Individuals consuming a low grain diet may have lower phosphoric acid compared to those on a conventional "Western Diet." More rarely, hypoparathyroidism may be involved.

Organic Acids: Autism

The following markers are highly correlated with autism:

- Yeast and bacteria (especially arabinose, citramalic acid, tartaric acid, HPHPA, 4-cresol, and DHPPA)
- Oxalates (specifically oxalic, glyceric, and glycolic acids)
- Mitochondrial function (including succinic, fumaric, malic, 2-oxoglutaric, aconitic, and citric acids)
- Neurotransmitter function (HVA, VMA, HVA/VMA ratio, and quinolinic acid)
- Nutritional markers relevant to autism treatment such as vitamins B6 and B12, and markers for detoxification

Eliminating yeast overgrowth can be an effective method of reducing autistic symptoms. Microbial overgrowth can be measured by urinary organic acids analysis of yeast and bacteria metabolites. The test also helps to identify indicators of methylation problems associated with autism.

Many children on the autism spectrum have an overgrowth of certain Clostridia species, which produce compounds such as HPHPA (3-(3-hydroxyphenyl)-3-hydroxypropionic acid) and 4-cresol. HPHPA and 4-cresol may disrupt dopamine metabolism by interfering with the enzyme, dopamine beta-hydroxylase. HPHPA is a potent toxin with profound neurological effects in autism, which can cause moodiness, tantrums, extreme anxiety, aggression, self-injurious behavior, and digestive problems.

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