



Organic Acids

Key Clinical Messages

What is the Organic Acids Test?

Vibrant’s Organic Acids Test is a urine-based test that measures organic acid excretion in a single urine collection sample first thing in the morning. Vibrant’s Organic Acids test includes 84 metabolic markers that can accurately identify conditions associated with genetic disorders, nutrient deficiencies, intestinal dysbiosis, and toxicity from the diet, environment, and certain medications.

What are Organic Acids?

Organic acids are byproducts of cellular metabolism. Based on known metabolic pathways and enzyme-cofactor requirements, these organic acid markers can provide great insights in discovering underlying causes of chronic symptoms.

Why Order Organic Acids?

The Organic Acids test provides a snapshot in time of an individuals’ biochemistry. It provides data on multiple different systems in the body in one test. Some of the important categories assessed on the test include:

- Energy metabolism
- Mitochondrial function
- Fat metabolism
- Nutrient deficiencies
- Glutathione status
- Toxic exposure
- Oxidative stress
- Methylation status
- Salicylate metabolism
- Oxalate levels
- Neurotransmitter end products
- Microbial overgrowth: bacteria, clostridia, yeast/fungus and mold exposure
- Inborn errors of metabolism

Organic acids testing can aid advanced providers in the detection of many underlying imbalances in chronically or acutely ill patients with complex illnesses. It can serve as a great first assessment test for individuals who have multi-system symptoms, complicated presentations or prefer urine collection instead of phlebotomy. Alongside other diagnostic testing, organic acids profiles complete the clinical picture of root causes and guide practitioners in developing the most individual and effective interventions.





Which Patients Benefit From This Test?

Conditions and symptoms which may benefit from organic acids testing Include:

- ADD/ADHD
- Autism spectrum disorder
- Mental and/or developmental delays
- Difficulty concentrating
- Hyperactivity
- Chronic fatigue syndrome
- Fibromyalgia
- Fatigue and weakness
- Depression and/or anxiety
- Confusion or dizziness
- Mood disorders or mood swings
- Insomnia or other sleep problems
- Slowed reaction time
- Poor memory
- Headaches or migraines
- Digestive dysfunction
- Nausea or vomiting
- Poor appetite
- Abdominal pain, diarrhea, bloating
- Hypo- or hyperglycemia
- Unexplained weight gain/loss
- Muscle weakness
- Hypotonia
- Chronic pain
- Eczema or dermatitis
- Immune deficiency or frequent infections
- Anemia
- Hearing, speech, or visual impairment
- Tachycardia
- Rapid or abnormal breathing
- Kidney stones
- Seizure disorders
- Other neurological disorders

Test Prep

Collection: One (1) urine specimen tube. First morning urine sample collection.

Hydration: Do not drink more than 8 oz water 1 hour prior to each urine collection. Samples may be rejected if the urine is too dilute.

Fasting: Not required.

Diet: Avoid apples, grapes, pears, and cranberries (as well as their juices), mushrooms, and ribose supplements 48 hours before collection.

Reference Ranges and Interpretation of Results

Reference ranges are established using urine samples from 1000 apparently healthy individuals. The levels are shown with three shades of color – Green, Yellow and Red. The result in green corresponds to normal reference range, the result in yellow corresponds to 5th to 25th percentile or 75th – 95th percentile (as applicable) and the result in red corresponds to <5th percentile or >95th percentile (as applicable) of the reference range.

The results are presented as a complete list of organic acids and their absolute levels normalized to creatinine in a quantile format along with the reference ranges. Reference ranges have not been validated in the pediatric population. Vibrant has a comprehensive interpretive guide for the Organic Acids Test to aid providers in the interpretation of their patient’s results.

Sample Results

Kreb's Cycle					
TEST NAME	CURRENT RESULT	PREVIOUS RESULT	CURRENT RESULT	PREVIOUS RESULT	REFERENCE
2-Oxoglutaric acid	18.78				≤43.51 mmol/mol
Aconitic acid	10.8				6.75-27.14 mmol/mol

Methodology

- The Organic Acids test uses gas chromatography with tandem mass spectrometry (GC-MS/MS).
- The analyte results are expressed by normalizing to the quantity of creatinine measured to account for urine dilution variations.
- Vibrant is a CLIA-certified and CAP-accredited lab.

Which Tests Pair Well With the Organic Acids Test?

- **Micronutrients** – to gain a comprehensive understanding of the patient’s whole nutrition foundation; if there are hints of nutrient deficiencies/insufficiencies on the Organic Acids test, it may be important to assess a patient’s overall nutrient outlook.
- **Gut Zoomer** – to take a deeper look at digestive capacity and the health of the microbiome to determine the extent of yeast and bacterial overgrowth; this is particularly helpful when other markers in the microbial metabolites panel are elevated.
- **Environmental Toxins** – to investigate the total toxic burden that can impact many enzymatic reactions affecting energy metabolism and mitochondrial function.
- **Heavy Metals** – to investigate the total toxic burden that can impact many enzymatic reactions affecting energy metabolism and mitochondrial function.
- **Mycotoxin** – to investigate the total toxic burden that can impact many enzymatic reactions affecting energy metabolism and mitochondrial function; this may be particularly important when other mold metabolites are also elevated.
- **Candida & IBS Panel** – to assess for fungal antibodies to gain a comprehensive understanding of the patient’s fungal burden, particularly if other fungal markers are elevated.
- **Neurotransmitters** – to get a comprehensive understanding of neurotransmitter imbalances, particularly if neurotransmitter metabolites are out of range.



What Markers Are Included on Vibrant's Organic Acids Test?

Microbial Markers					
Yeast and Fungal Markers		Bacterial Markers		Clostridia Bacterial Markers	
Citramalic Acid 5-Hydroxymethyl-furoic Acid 3-Oxoglutaric Acid Furan-2,5-dicarboxylic Acid Furancarboxylglycine Tartaric Acid Arabinose Carboxycitric Acid Tricarballic Acid		Hippuric Acid 2-Hydroxyphenylacetic Acid 4-Hydroxybenzoic Acid 4-Hydroxyhippuric Acid DHPPA		4-Hydroxyphenylacetic Acid HPHPA 4-Cresol Indoleacetic Acid	
Detoxification & Oxidative Stress Markers					
Glutathione		Ammonia Excess		Toxins	
Pyroglutamic Acid 2-Hydroxybutyric Acid N-acetylcysteine Acid		Orotic Acid		Mandelic Acid	
Energy Metabolism & Mitochondrial Function Markers					
Krebs Cycle Metabolites		Glycolysis Markers		Ketone and Fatty Acid Oxidation	Mitochondrial Markers
Succinic Acid Fumaric Acid Malic Acid 2-Oxoglutaric Acid Cis-aconitic Acid Citric Acid		Lactic Acid Pyruvic Acid		3-Hydroxybutyric Acid Acetoacetic Acid 4-Hydroxybutyric Acid Adipic Acid Suberic Acid Sebacic Acid Ethylmalonic Acid Methylsuccinic Acid	3-Methylglutaric Acid 3-Methylglutaconic Acid 3-Hydroxyglutaric Acid
Amino Acid Metabolites			Nutrition & Oxalate Markers		
2-Hydroxyisovaleric Acid 3-Methyl-2-oxovaleric Acid 2-Hydroxyisocaproic Acid 2-Oxoisocaproic Acid 2-Oxo-4-methylbutyric Acid Phenylactic Acid		Phenylpyruvic Acid Homogentisic Acid 4-Hydroxyphenyllactic Acid N-Acetylaspartic Acid Malonic Acid 2-Oxoisovaleric Acid		3-Hydroxybutyric Acid Acetoacetic Acid 4-Hydroxybutyric Acid Adipic Acid Suberic Acid Sebacic Acid Ethylmalonic Acid Methylsuccinic Acid 3-Hydroxy-3-methylglutaric Acid	
Neurotransmitter Markers				Pyrimidine Metabolites	
Catecholamine Metabolites & Ratios		Serotonin Metabolites & Ratios		Uracil	Thymine
DOPAC HVA/VMA Ratio HVA HVA/DOPAC Ratio VMA		5-HIAA Quinolinic Acid Kynurenic Quinolinic Acid/ Acid 5-HIAA Ratio		Aspartame, Salicylates, or GI bacteria	
				2-Hydroxyhippuric Acid	
				Mineral Metabolites	
				Phosphoric Acid	

