

Autism Spectrum Disorder (ASD) & Special Needs

A pattern-based urine metabolite assessment that may help contextualize gut, mitochondrial, nutrient, and detoxification-related physiology in complex neurodevelopmental presentations.

Children with ASD and related special needs presentations often have overlapping gastrointestinal, mitochondrial, nutrient, and redox-related physiology that may not be apparent from symptoms alone.^[1,2,8,13,19] The Organic Acids Test is a pattern-based assessment looking at imbalances that can support clinical reasoning by identifying metabolite trends associated in the literature with dysbiosis, altered energy metabolism, and cofactor insufficiency.^[1,4,7,14]



When to Consider the Organic Acids Test (OAT)

GI complaints: Constipation, diarrhea, bloating, foul-smelling stool, or variable bowel patterns that may suggest microbial or fermentation-related imbalance
^[2,3,4,6]

Energy or endurance concerns: Fatigue, poor stamina, regression after illness, or patterns consistent with impaired mitochondrial efficiency^[1,8,9]

Redox or detoxification stress patterns: Clinical concern for low glutathione resilience, methylation burden, or oxidative stress-related vulnerability
^[13,14,15,16]

Behavioral variability after foods or antimicrobials: Symptom shifts that may track with yeast, clostridia, or altered gut-brain signaling^[4,5,6,7]

Nutrient insufficiency questions: Restricted eating, selective diets, or concern for functional B-vitamin, antioxidant, or cofactor need^[17,18,19]

Complex multisystem presentations: Children with overlapping sleep, attention, communication, sensory, and GI concerns where a broader metabolic snapshot may help organize next steps^[1,7,10,11]

What the OAT Measures

Analyte Class	What it Reflects	ASD & Special Needs Relevance
Microbial Overgrowth	Gut fermentation products from bacterial, yeast, and fungal activity; literature discusses clostridia-, Candida-, and Aspergillus-associated metabolites rather than a single external exposure source ^[2,4,5,6]	May help contextualize dysbiosis-related metabolite output, gut-brain signaling, and neurotransmitter-related patterns observed in ASD literature ^[2,3,4,6]
Mitochondrial Health / Energy Markers	Physiologic demand, illness stress, and metabolic inefficiency can shift pyruvate, lactate, citric acid cycle intermediates, and beta-oxidation markers; these are endogenous functional markers rather than direct exposure markers. ^[1,8,9]	May reflect altered energy production, TCA cycle stress, or fatty acid oxidation inefficiency associated in the literature with ASD subgroups. ^[1,8,9]

What OAT Measures (Cont)

Analyte Class	What it Reflects	ASD & Special Needs Relevance
Neuro-transmitter Metabolites	Downstream urinary metabolites of catecholamine and serotonin turnover, shaped by host metabolism and potentially by gut-derived metabolites such as HPHA. [5,10,11]	Can support pattern recognition around dopamine, norepinephrine, serotonin, and kynurenine pathway balance and cofactor needs. [5,10,11,12]
Methylation / Detoxification markers	Methyl donor and transsulfuration pathway intermediates influenced by B12, folate-related metabolism, glutathione demand, and redox stress. [13,14,15]	May help contextualize methylation capacity, glutathione synthesis resilience, and redox burden discussed in ASD literature. [13,14,15,16]
Nutrient needs	Functional signals related to B2, B5, B6, B12, vitamin C, and CoQ10-dependent pathways rather than direct dietary intake. [17,18,19]	Can support clinical reasoning around cofactor need when interpreted with imbalances assessed on the OAT. [17,18,19]
Toxic Exposure	Markers associated with fungal/mycotoxin-related patterns, mineral binding effects, or broader toxicant stress; OAT does not directly quantify toxicants or mycotoxins. [1,5,17]	May help contextualize environmental burden hypotheses when paired with history and other testing, especially when TCA and microbial patterns converge. [1,5,17]

Clinical Applications & Evidence Context

Condition	Clinical Encapsulation
Autism spectrum disorder	In urinary organic acid patterns across microbial, mitochondrial, nutrient, and redox domains have been reported in the ASD research literature (case-control, review, and metabolomic studies); these finds are exploratory and not diagnostic. [1,7,9,19]
Gut dysbiosis / microbial overgrowth	Clostridia-, yeast-, and broader microbiota-derived metabolites have been linked with altered gut-brain signaling and neurobehavioral features in ASD literature, supporting hypothesis generation around intestinal contributors. [2,3,4,5,6]
Mitochondrial dysfunction patterns	Systematic reviews and urinary organic acid studies describe associations between ASD and altered pyruvate, lactate, TCA intermediates, and beta-oxidation markers consistent with impaired energy metabolism. [1,8,9]
Neurotransmitter imbalance patterns	HPHPA-related dopamine-beta-hydroxylase inhibition and altered kynurenine pathway balance provide mechanistic models for how urinary metabolites may align with catecholamine and neuroinflammatory physiology. [5,10,11,12]
Methylation / transsulfuration stress	Methylation cycle and glutathione pathway differences reported in ASD cohorts provide context for interpreting pyroglutamate, methylmalonic, and related OAT markers as functional signals. [13,14,15,16]
Functional nutrient insufficiency	B-vitamin and antioxidant pathway disruptions reported in ASD may help explain imbalances seen when intake, absorption, and metabolic demand are clinically relevant. [17,18,19]
Oxalate-related burden	Urinary and plasma oxalate elevations have been reported in ASD cohorts, suggesting a possible contributory pattern in selected patients when interpreted alongside GI and nutrient context. [20]

How the OAT Supports Clinical Reasoning

Pattern recognition:

OAT can help organize findings across microbial, mitochondrial, neurotransmitter, nutrient, and redox domains rather than relying on a single marker.^[1,7,17]

Subgroup context:

Published literature suggests physiologic heterogeneity within ASD, so metabolite patterns may help identify which mechanisms are most relevant for a given patient presentation.
[1,8,11,19]

Follow-up planning:

Results may inform whether stool, nutrient, toxicant, mitochondrial, or broader clinical history review should be prioritized next.^[2,5,13,17]

Response monitoring:

Repeating a pattern-based metabolite assessment can support longitudinal clinical reasoning when dietary, antimicrobial, nutrient, or environmental interventions are being evaluated.^[7,9,16]

How to Order

To order the Organic Acids Test (OAT), contact your Mosaic Diagnostics representative or visit [www.mosaicdx.com]. Specimen collection kits and requisition forms are available through your account portal. For clinical support or interpretation questions, contact our clinical education team.

This document is intended for licensed healthcare professionals and is for informational and educational purposes only. The test results are not intended to diagnose, treat, cure, or prevent disease. All clinical interpretation should be done by a qualified healthcare professional in the context of the individual patient. Statements regarding associations between health symptoms and conditions do not constitute diagnostic claims.

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