

# Neurologic & Mental Health

Mapping metabolic patterns that may help contextualize complex neurologic and mental health presentations.

Neurologic and mental health presentations often involve overlapping cognitive, emotional, sensory, autonomic, and whole-body features rather than isolated symptoms—contributing to unclear clinical pictures and ongoing patient needs.<sup>[1,2,3]</sup> The Organic Acids Test (OAT) is a urine-based metabolite profile that evaluates markers of microbial metabolism, mitochondrial health, neurotransmitter-related pathways, methylation/detoxification capacity, nutrient-dependent processes, and toxicant-associated metabolic patterns.<sup>[1–5]</sup> By mapping across metabolic signatures, OAT may help contextualize physiologic contributors to complex symptom presentations—supporting clinical reasoning in patients where conventional workup alone leaves underlying mechanisms unclear.<sup>[1–10]</sup>



## When Might Providers Consider the OAT?

**Fatigue & Reduced Energy Resilience:** Fatigue, post-exertional symptom worsening, or energy fluctuation suggesting metabolic inefficiency or mitochondrial pathway involvement.<sup>[4,6,7]</sup>

**Sensory Sensitivity & Headache Patterns:** Recurrent headaches, migraine-like episodes, light/sound sensitivity, or dizziness—especially with overlapping cognitive or autonomic features.<sup>[10]</sup>

**Complex Multisystem Presentations:** Patients with overlapping neurologic, psychiatric, and systemic symptoms—including post-infectious conditions, chronic fatigue syndromes, or neuroimmune presentation.<sup>[1–9]</sup>

**Mood Dysregulation & Emotional Lability:** Persistent or recurrent anxiety, low mood, irritability, or reduced stress tolerance.<sup>[1,2,3,4]</sup>

**Brain Fog & Cognitive Variability:** Fluctuating attention, slowed processing, word-finding difficulty, or reduced cognitive stamina.<sup>[1,2,3]</sup>

**Autonomic & Gut-Brain Symptoms:** GI complaints (bloating, altered motility, nausea) co-occurring with cognitive, mood, or fatigue symptoms, suggesting gut-brain axis involvement.<sup>[1,2]</sup>

## What the OAT Measures

| Analyte Class                         | What It Reflects                                                                                       | Neurologic Relevance                                                                                                                     |
|---------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Microbial Metabolites</b>          | Host-microbiome metabolic activity; gut-derived compounds produced by bacterial and yeast fermentation | Provides context for gut-brain signaling patterns associated with cognitive, mood, and behavioral symptom variability <sup>[1,2,3]</sup> |
| <b>Mitochondrial Function Markers</b> | Citric acid cycle intermediates and markers of cellular energy production efficiency                   | May reflect metabolic reserve relevant to fatigue, cognitive stamina, and stress tolerance <sup>[6,7,10]</sup>                           |

# What the OAT Measures (Cont)

| Analyte Class                        | What It Reflects                                                                                                           | Neurologic Relevance                                                                                                              |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Neurotransmitter Metabolites         | Catecholamine- and serotonin-related pathway metabolites reflecting turnover dynamics (not synaptic levels)                | Offers indirect insight into monoamine pathway activity associated with mood, attention, and sensory regulation <sup>[2,3]</sup>  |
| Methylation / Detoxification Markers | One-carbon metabolism, transsulfuration, and glutathione-associated pathway activity (e.g., pyroglutamic acid)             | Provides context for detoxification capacity and cellular redox balance relevant to neuropsychiatric presentations <sup>[4]</sup> |
| Nutrient-Related Markers             | Vitamin-dependent cofactor demand (B vitamins, vitamin C) supporting mitochondrial function and neurotransmitter synthesis | May indicate increased biochemical demand influencing energy metabolism and neurotransmitter pathway efficiency <sup>[5]</sup>    |
| Toxicant-Associated Markers          | Patterns consistent with environmental or endogenous metabolic burden from exogenous chemical exposure                     | May provide context when environmental exposures contribute to mitochondrial or neurotransmitter pathway stress <sup>[9]</sup>    |

## Related Conditions

| Condition                               | Clinical Encapsulation                                                                                                                                                                                                                                                           |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Depression & Anxiety Disorders          | Alterations in neurotransmitter metabolism, microbial-derived metabolites, and oxidative stress pathways have been associated with depression and anxiety, supporting OAT's potential role in contextualizing metabolic contributors to mood dysregulation. <sup>[1,2,3,4]</sup> |
| Autism Spectrum Disorder                | ASD has been associated with differences in microbial metabolism, mitochondrial function, oxidative stress pathways, and nutrient-dependent processes in subsets of patients; OAT findings may help contextualize these overlapping metabolic patterns. <sup>[2,4,5,7,8]</sup>   |
| ADHD                                    | ADHD has been studied in relation to mitochondrial function, neurotransmitter metabolism, oxidative stress, and nutrient-dependent pathways; OAT may support pattern recognition in complex attentional presentations. <sup>[4,5,6]</sup>                                        |
| Alzheimer's Disease & Related Dementias | Neurodegenerative disorders have been associated with mitochondrial dysfunction, oxidative stress, and metabolic dysregulation; OAT may provide indirect metabolic context in early or complex presentations. <sup>[3,4]</sup>                                                   |
| Parkinson's Disease                     | Parkinsonian neurodegeneration has been associated with mitochondrial dysfunction and oxidative stress pathways; OAT findings may help map systemic metabolic contributions in neuroimmune or complex presentations. <sup>[3,4]</sup>                                            |
| Chronic Fatigue & Neuroimmune Syndromes | Fatigue syndromes are frequently associated with mitochondrial dysfunction, oxidative stress, and metabolic imbalance; OAT may support identification of metabolic pattern contributors in post-infectious and multisystem fatigue presentations. <sup>[4,6,7]</sup>             |

# How the OAT Supports Clinical Reasoning

## Cross-Domain Pattern Recognition

OAT evaluates six interconnected metabolic domains simultaneously, enabling pattern-based interpretation across microbial, mitochondrial, neurotransmitter, methylation, nutrient, and toxicant pathways that may be relevant in multisystem neurologic and mental health presentations <sup>[1–5]</sup>

## Physiologic Context for Complex Presentations:

In patients with overlapping cognitive, mood, fatigue, and autonomic symptoms, OAT findings may help identify metabolic contributors not captured by standard neurologic or psychiatric workup, supporting more informed clinical reasoning <sup>[1–10]</sup>

## Cofactor & Nutrient Demand Assessment

Nutrient-related and mitochondrial markers may indicate increased biochemical demand for vitamin-dependent cofactors supporting neurotransmitter synthesis and energy metabolism—providing actionable context for individualized support strategies <sup>[5,6,7]</sup>

## How to Order

To order the Organic Acids Test (OAT), contact your Mosaic Diagnostics representative or visit [[www.mosaicdx.com](http://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.*

## References

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