NATURAL ADHD SOLUTIONS

The ADHD Lab Testing *Guide*

What to run, what's "normal,"
and what's actually optimal.

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"Normal" doesn't always mean *optimal.*

A patient walks in with brain fog, fatigue, and poor focus. The labs from their last physical look fine — every marker inside the reference range. So why do they still feel this way?

Reference ranges in conventional laboratory medicine are designed to identify overt disease. They flag values that fall outside the statistical distribution of the broader population, and that is an essential function — it's how most clinical labs are validated and how risk thresholds are set. But the same ranges were not designed to define optimal physiological function, and in clinical practice that distinction matters.

A ferritin of 25 ng/mL is technically within range. So is a vitamin D of 32 ng/mL, a TSH of 3.8 mIU/L, and a B12 of 350 pg/mL. None of these will be flagged on a standard report. Yet for a patient presenting with ADHD-related cognitive symptoms, each of these values has been associated with measurable functional impact in the peer-reviewed literature.

> *Reference ranges help identify disease. Functional ranges help describe what optimal looks like for the patient in front of you.*

This guide presents the foundational markers I order in adults and children presenting with ADHD or ADHD-like symptoms. It is a starting point, not a complete clinical picture. Depending on the patient, a full evaluation often extends into additional areas such as advanced micronutrient testing, organic acids, a full hormone panel including sex hormones, gut and microbiome analysis, genetic polymorphisms, and environmental exposures — each of which can meaningfully shape the direction of care.

In the era of personalized and individualized medicine, there is no single panel that fits every patient. Which of these additional tests are most relevant depends on the individual — their symptoms, history, and what a standard workup has or hasn't already revealed. The goal is targeted testing that actually informs care, not testing for its own sake.

What's *inside.*

Nine systems. The foundational labs, with conventional and functional ranges side by side.

• HOW TO USE THIS GUIDE

Each section covers one system, why it matters for ADHD, the markers I run, and how to interpret them. The narrower optimal range I use clinically is shown in mint, alongside the conventional reference range. Use the printable Request Sheet at the back to order testing through your physician.

SYSTEM 01

01 Iron Status

Iron is the rate-limiting cofactor for tyrosine hydroxylase, the enzyme that converts tyrosine into L-DOPA — the immediate precursor to dopamine. Adequate iron status is foundational to dopamine synthesis, which is why iron is one of the first markers worth evaluating in any ADHD workup.

The clinical literature on iron and ADHD is substantial. Multiple pediatric studies have found that children with ADHD have significantly lower ferritin levels than non-ADHD controls, and several have shown that iron repletion in deficient children can produce measurable improvements in attention and behavior. In adults, suboptimal iron is commonly associated with brain fog, fatigue, anxiety, cold extremities, restless legs, exercise intolerance, and reduced cognitive stamina.

Ferritin is the most useful single marker, but the conventional reference range is wide enough that values associated with cognitive symptoms often fall within it. A ferritin of 20 ng/mL is technically within range and will not typically be flagged on a standard report, but it is generally considered insufficient to support optimal dopaminergic function. In clinical practice, I look for ferritin above 70 ng/mL in adults and above 50 ng/mL in children before considering iron status adequate in the context of ADHD-related symptoms.

MARKER	CONVENTIONAL RANGE	OPTIMAL RANGE
Ferritin (adult M)	38–380 ng/mL	**70–100**
Ferritin (adult F)	16–154 ng/mL	**70–100**
Ferritin (children)	6–67 ng/mL	**>50**
Iron, Total	40–190 µg/dL	**85–130**
TIBC	250–450 µg/dL	**250–350**
% Saturation	16–48%	**25–40%**

Clinical Note — Ferritin is an acute-phase reactant and can be elevated in the setting of inflammation, which may mask a true iron deficiency. Interpreting ferritin alongside hs-CRP improves accuracy.

SYSTEM 02

02 Thyroid (Full Panel)

Suboptimal thyroid function can produce symptoms that closely overlap with ADHD: fatigue, brain fog, slowed processing, poor memory, and reduced motivation. A complete thyroid panel helps distinguish between the two and identifies cases where both are contributing.

The thyroid sets the metabolic tempo of every cell in the body, including neurons in the prefrontal cortex, which makes thyroid dysfunction difficult to differentiate from ADHD on history alone.

TSH alone is the most commonly ordered thyroid marker, but it has limitations as a stand-alone screen. TSH reflects pituitary signaling, not tissue-level thyroid hormone activity, and patients can present with a TSH within range while still having low free T3 — the metabolically active form. T4 to T3 conversion depends on adequate selenium, along with supporting nutrients such as zinc and iron, and can be impaired by chronic stress and cortisol dysregulation. For this reason, I include TSH, free T4, and free T3 on every initial workup, and add reverse T3, TPO, and thyroglobulin antibodies when symptoms, history, or initial results suggest impaired conversion or autoimmune thyroid disease.

MARKER	CONVENTIONAL RANGE	OPTIMAL RANGE
TSH	0.27–4.2 µIU/mL	**0.5–2.0**
Free T4	0.92–1.68 ng/dL	**1.1–1.5**
Free T3	2.0–4.4 pg/mL	**3.0–4.2**
ADD WHEN INDICATED		
Reverse T3	5.0–25.0 ng/dL	**<16**
TPO Antibodies	<9 IU/mL	**<9**
Thyroglobulin Ab	<2 IU/mL	**<1**

Clinical Note — A TSH in the upper end of the conventional range, combined with free T3 in the lower third of its range and a clinical picture of fatigue and cognitive slowing, may warrant further evaluation even when no individual marker is technically abnormal.

SYSTEM 03

03 B Vitamins & Methylation

The methylation cycle is central to the synthesis and recycling of neurotransmitters, including dopamine, norepinephrine, and serotonin. Vitamins B12, folate, and B6 serve as essential cofactors. When methylation is impaired, neurotransmitter production can suffer in ways that meaningfully affect cognitive function.

Catecholamine synthesis depends on tetrahydrobiopterin (BH4), a cofactor that must be continuously regenerated. BH4 regeneration requires a functioning methylation cycle, which in turn depends on adequate B12, folate, and B6. Disruption at any point in this pathway can reduce dopamine and norepinephrine availability downstream, even when upstream substrates appear adequate. This is one reason patients with MTHFR polymorphisms sometimes present with ADHD-like symptoms, anxiety, or mood disturbance — the mechanism is not the variant itself, but its downstream effect on methylation efficiency and neurotransmitter synthesis.

Homocysteine is the marker that most usefully reflects overall methylation status. The conventional cutoff of 15 µmol/L is far too lenient. The cognitive literature identifies meaningful concern at values above 11 µmol/L, and cardiovascular risk rises continuously with no clear threshold. In clinical practice, I aim for 5–7 µmol/L. Serum B12 is flagged as deficient only below 200 pg/mL on most reports, yet measurable declines in nerve conduction and cognitive processing speed have been documented at values around 400–500 pg/mL — well within the conventional "normal" range.

MARKER	CONVENTIONAL RANGE	OPTIMAL RANGE
Vitamin B12	200–1100 pg/mL	**>800**
Folate (serum)	>5.4 ng/mL	**>15**
Homocysteine	0–15 µmol/L	**5–7**

Clinical Note — Elevated homocysteine in the presence of adequate B12 and folate suggests impaired methylation efficiency, often pointing toward an MTHFR polymorphism or suboptimal B6 status. In these cases, methylated forms of B vitamins (methylcobalamin, methylfolate) are generally better tolerated and more clinically effective than synthetic forms.

SYSTEM 04

04 Minerals

Magnesium plays a central role in nervous system regulation. Copper is an essential cofactor for converting dopamine into norepinephrine, while zinc supports neurotransmitter function indirectly — including activation of vitamin B6, the cofactor that converts L-DOPA into dopamine — and competes with copper for absorption. Imbalances in any of these minerals can contribute to the cognitive and emotional symptoms commonly seen in ADHD.

Magnesium is involved in more than 300 enzymatic reactions, including GABA synthesis, NMDA receptor regulation, and modulation of the HPA axis. Insufficient magnesium has been associated with anxiety, sleep disturbance, restlessness, and difficulty with emotional regulation. Serum magnesium has limited utility for assessing overall status — the body tightly regulates serum values by drawing from intracellular and bone stores, which means a patient can have meaningful tissue depletion while serum values remain within range. RBC magnesium reflects intracellular status more accurately and is the preferred test when available.

Copper is a required cofactor for dopamine beta-hydroxylase, the enzyme that converts dopamine into norepinephrine. Zinc supports dopamine function through a separate pathway and competes with copper for absorption, so the two minerals exist in a dynamic balance — typically near a 1:1 serum ratio. Elevated copper relative to zinc has been associated with attentional difficulties, anxiety, and irritability in some patients. For this reason, zinc and copper are most informative when measured together, with attention paid to the ratio in addition to the absolute values.

MARKER	CONVENTIONAL RANGE	OPTIMAL RANGE
RBC Magnesium	4.0–6.4 mg/dL	**6.0–6.4**
Zinc (plasma)	60–130 µg/dL	**90–120**
Copper (serum)	70–175 µg/dL	**90–120**

Clinical Note — When ordering, RBC magnesium is preferred over serum magnesium for the reasons noted above. Zinc and copper should ideally be drawn together and fasting, and not on a day when supplemental zinc has been taken.

SYSTEM 05

05 Vitamin D

Vitamin D functions more like a steroid hormone than a traditional vitamin, with receptors throughout the brain — including in regions involved in attention, executive function, and reward processing. Insufficient vitamin D is common in patients presenting with ADHD-related symptoms.

Several studies have found lower 25-hydroxyvitamin D levels in children and adults with ADHD compared to neurotypical controls. The proposed mechanisms include direct regulation of dopamine signaling, modulation of neuroinflammation, and effects on neurodevelopmental processes. While the literature on supplementation outcomes remains mixed, identifying and correcting frank insufficiency is reasonable in any patient with cognitive symptoms.

The conventional cutoff of 30 ng/mL was established to prevent overt deficiency states, not to define a level associated with optimal cognitive, immune, and mood function. The literature generally supports a target range of 50–80 ng/mL for adults. Vitamin D supplementation is most effective when accompanied by adequate magnesium — required for vitamin D activation in the liver and kidneys — and vitamin K2, which supports appropriate calcium handling.

MARKER	CONVENTIONAL RANGE	OPTIMAL RANGE
25-OH Vitamin D	30–100 ng/mL	**50–80**

Clinical Note — Vitamin D is fat-soluble and accumulates over time. Baseline testing prior to higher-dose supplementation is appropriate, with follow-up testing every three months until the patient stabilizes within range.

SYSTEM 06

06 Metabolic Health

Glucose regulation has a meaningful impact on cognitive function, and the ADHD brain appears to be particularly sensitive to glycemic variability. Early metabolic dysfunction can amplify ADHD symptoms well before it would meet diagnostic criteria for prediabetes or insulin resistance.

The prefrontal cortex is metabolically demanding and is among the first brain regions to feel the effects of unstable blood glucose. When blood sugar rises sharply after a high-carbohydrate meal and then drops a few hours later, the cognitive effects — fogginess, irritability, difficulty concentrating, the mid-afternoon energy dip — are often more pronounced in patients with ADHD than in neurotypical controls. Stabilizing glycemic patterns is one of the more underappreciated levers for improving day-to-day cognitive function in this population.

HbA1c reflects average blood glucose over the preceding three months and is the most widely available marker for glycemic trends. The conventional threshold for prediabetes is 5.7%, but cognitive symptoms associated with glucose variability often appear well before that threshold is reached. In clinical practice, an HbA1c in the 4.8–5.2% range is generally considered optimal, with values above 5.4% suggesting it may be worth examining dietary patterns and post-meal glucose responses more closely.

The Comprehensive Metabolic Panel offers a baseline view of fasting glucose, kidney and liver function, and electrolyte balance. While it is rarely the headline of an ADHD workup, it provides important context — early signs of hepatic stress, dehydration, or electrolyte imbalance can subtly contribute to fatigue and cognitive symptoms.

MARKER	CONVENTIONAL RANGE	OPTIMAL RANGE
HbA1c	<5.7%	**4.8–5.2%**
CMP	— full panel —	**All in range**

Clinical Note — When HbA1c is rising but fasting glucose remains within range, post-prandial glucose excursions are often the underlying driver. A short trial with a continuous glucose monitor can be highly informative for both clinician and patient.

SYSTEM 07

07 Inflammation

Chronic low-grade inflammation can disrupt neurotransmitter signaling, affect blood-brain barrier integrity, and contribute to cognitive symptoms. Screening for systemic inflammation is a useful and inexpensive addition to a standard ADHD workup.

When the immune system is chronically activated — whether by gut dysbiosis, food sensitivities, environmental exposures, persistent infections, sleep disturbance, or visceral adiposity — circulating cytokines can cross the blood-brain barrier and influence dopamine and serotonin signaling. This phenomenon, often referred to as neuroinflammation, is increasingly recognized as a contributing factor in ADHD, depression, and persistent cognitive symptoms.

High-sensitivity C-reactive protein (hs-CRP) is a widely available and cost-effective marker of overall inflammatory burden. Conventional reference ranges are oriented toward cardiovascular risk stratification, with values above 3.0 mg/L considered high risk. For cognitive health, a tighter target is generally more useful — values below 1.0 mg/L, and ideally below 0.5 mg/L, are associated with lower inflammatory load.

MARKER	CONVENTIONAL RANGE	OPTIMAL RANGE
hs-CRP	<3 mg/L	**<1.0 (ideally <0.5)**

Clinical Note — hs-CRP is non-specific and indicates the presence of inflammation without identifying its source. When elevated, follow-up evaluation might include stool analysis, food sensitivity testing, sleep evaluation, and a closer look at metabolic health.

SYSTEM 08

08 Stress & HPA Axis

Dysregulation of the HPA axis can affect focus, energy, and emotional regulation in ways that overlap significantly with ADHD presentations. In clinical practice, the two often coexist, and untreated HPA dysfunction can complicate the overall picture.

The hypothalamic-pituitary-adrenal axis governs the body's stress response and follows a characteristic diurnal pattern: cortisol peaks in the early morning to support waking, declines gradually throughout the day, and reaches its lowest point at night to permit sleep. When the axis is dysregulated — by chronic stress, trauma, sleep disturbance, glycemic variability, or longstanding undertreated ADHD itself — that diurnal curve can flatten, invert, or shift, producing symptoms such as morning fatigue, late-evening alertness, and difficulty initiating sleep.

Many of these symptoms are familiar to adults with ADHD and are often attributed solely to ADHD itself, when in fact a treatable HPA pattern may be contributing alongside it. Distinguishing between the two — or recognizing both — improves clinical clarity and can meaningfully change the treatment approach.

An AM serum cortisol drawn between 7 and 9 AM is a reasonable starting point and gives information about whether the morning peak is occurring as expected. However, it represents a single snapshot. When the morning value is unclear or symptoms strongly suggest HPA involvement, a four-point salivary cortisol test provides a more complete picture of the diurnal pattern.

MARKER	CONVENTIONAL RANGE	OPTIMAL RANGE
Cortisol (AM serum, 7–9 AM)	4–22 µg/dL	**12–18**

Clinical Note — A single morning cortisol value cannot reliably characterize HPA axis function on its own. When clinical suspicion is high — particularly with patterns of morning fatigue, evening alertness, and disrupted sleep onset — a four-point salivary cortisol test is more informative.

SYSTEM 09

09 Complete Blood Count

The complete blood count is included in nearly every routine panel and offers significant value beyond its standard interpretation. Subtle patterns within the red cell indices and white cell differential can provide early signals of nutrient insufficiency, inflammation, or immune dysregulation.

A CBC is typically reviewed for values that fall outside the reference range, which appropriately flags overt anemia, frank infection, and other acute findings. However, the more subtle patterns within the indices — particularly MCV (mean corpuscular volume), MCH (mean corpuscular hemoglobin), and RDW (red cell distribution width) — can suggest early B12, folate, or iron insufficiency well before any individual marker drifts out of range.

When evaluating a CBC in the context of an ADHD workup, several patterns are worth attention. A high-normal MCV can suggest early B12 or folate insufficiency. A low-normal MCV combined with low-normal MCH may suggest iron-restricted erythropoiesis, particularly when paired with low-normal serum iron or transferrin saturation. An RDW above 13.5% can indicate mixed nutritional issues or chronic low-grade inflammation. Shifts in the lymphocyte-to-neutrophil ratio may reflect chronic immune activation worth further evaluation.

None of these patterns will be flagged on a routine report, but they are present in the same panel that has likely already been ordered. A more detailed read of an existing CBC is one of the lowest-cost ways to add depth to a workup.

• PATTERNS WORTH NOTING

High-normal MCV may suggest early B12 or folate insufficiency. Low-normal MCV with low-normal MCH may suggest iron-restricted erythropoiesis, especially when serum iron or transferrin saturation is also low-normal. RDW above 13.5% can indicate mixed nutritional issues or chronic inflammation. Shifts in lymphocyte and neutrophil ratios may reflect ongoing immune activation.

Clinical Note — The CBC is included in nearly every standard blood panel, which makes it one of the most accessible additional sources of clinical information when read with attention to the indices.

Lab Testing Request

Patient checklist — print and bring to your provider

Adapted from:
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Please consider ordering the following labs as part of a foundational workup for ADHD-related symptoms (cognitive, mood, energy, attention). These markers cover the most common functional drivers we see in adults and children with ADHD presentations.

Iron Status

- [ ] Ferritin
- [ ] Serum Iron
- [ ] TIBC
- [ ] Iron Saturation (%)

Thyroid (Full Panel)

- [ ] TSH
- [ ] Free T4
- [ ] Free T3
- [ ] Reverse T3 *(if indicated)*
- [ ] TPO & Thyroglobulin antibodies *(if indicated)*

B Vitamins & Methylation

- [ ] Vitamin B12 (serum)
- [ ] Folate (serum)
- [ ] Homocysteine

Minerals

- [ ] RBC Magnesium *(not serum)*
- [ ] Zinc (plasma)
- [ ] Copper (serum)

Vitamin D

- [ ] 25-OH Vitamin D

Metabolic Health

- [ ] HbA1c
- [ ] Comprehensive Metabolic Panel (CMP)

Inflammation

- [ ] hs-CRP (high-sensitivity)

Stress & HPA Axis

- [ ] AM Cortisol (serum, 7–9 AM)
- [ ] 4-point salivary cortisol *(if indicated)*

Complete Blood Count

- [ ] CBC with differential

Patient Notes

- [ ]
- [ ]
- [ ]

Note to provider: If your patient's results return within "normal" range but symptoms persist, please consider that conventional reference ranges are population-based and may not reflect optimal physiological function. Functional ranges are tighter and often clinically meaningful even when conventional ranges are met. — *Dr. Dan Sullivan, NMD IFMCP*

NEXT STEP

Ready to take the *next step?*

This guide gives you the framework. The next step is a conversation about your current challenges, the goals you're working toward, and whether working together makes sense. Two ways to start:

• RECOMMENDED

Book a Discovery Call

A focused conversation about your current challenges, the goals you're working toward, and whether we'd be a good fit to work together.

BOOK A DISCOVERY CALL

$30 • 20 MINUTES

OR — START WITH THE LABS

Order the panel yourself

I've put the full panel from this guide into my Rupa store so you can order it directly — no doctor's visit required. Run the labs on your own timeline, then book a discovery call when you're ready to talk about working together.

ORDER THE ADHD LAB PANEL

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This guide is provided for educational and informational purposes only. It is not intended to be a substitute for professional medical advice, diagnosis, or treatment. Always seek the advice of your physician or other qualified health provider with any questions you may have regarding a medical condition.

Never disregard professional medical advice or delay in seeking it because of something you have read in this guide. The information presented here reflects the clinical opinions and experience of Dr. Dan Sullivan, NMD IFMCP, and may not apply to every individual. Functional reference ranges discussed are clinical preferences, not regulatory standards, and should be interpreted in the context of a complete history and examination.

Lab testing should always be ordered, interpreted, and acted upon under the supervision of a licensed healthcare provider who is familiar with your individual case. Do not begin, stop, or modify any supplement, medication, or treatment based on the contents of this guide without consulting your physician.

Dr. Dan Sullivan, NMD IFMCP, and any affiliated entities assume no responsibility or liability for any consequence resulting directly or indirectly from any action or inaction taken based on the information contained in this guide.

If you are experiencing a medical emergency, call 911 or go to your nearest emergency department immediately.

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