



Research Summary: Fatigue #8

As featured in Dr. Kenny Mittelstadt's video:
Adrenal Fatigue Symptoms: What They Actually Mean
Date of Publication: 07/02/2026

Research Context:

This week's topic explores how "adrenal fatigue" isn't really about tired glands. It's about a stress-hormone rhythm that's fallen out of sync with your day. Most people who hear this term have been told one of two things: that nothing is wrong because a single lab value looked normal, or that their adrenals are "burned out" and just need support, with no real data behind either explanation. Both answers stop the investigation too early. Below are three studies that help connect these dots and show why a single morning blood test can miss the bigger picture entirely, and why the same underlying rhythm can show up as fatigue, blood sugar swings, salt cravings, or a shaky immune system, depending on the person.

Key Findings from the Research:

Study 1 (PMID 25433974):

Researchers compared people with diagnosed clinical burnout, people with milder, unofficial burnout symptoms, and healthy controls, tracking their saliva cortisol six times throughout the day across two separate non-workdays. Both burnout groups, whether formally diagnosed or not, showed a lower cortisol awakening response than the healthy group. That's the normal morning surge of cortisol that helps shift your body into daytime mode and gives you that floor of alertness to stand on. In plain terms, the "can't get going" feeling so many people describe in the mornings isn't just perception, and it isn't laziness. It shows up as a measurable dip in morning cortisol, even in people who haven't been formally diagnosed with burnout, which suggests this rhythm disruption develops gradually, often years before symptoms become severe enough to receive an official clinical label.

Study 2 (PMID 25617169):

This review looks at mineralocorticoid deficiency, meaning low levels of aldosterone, a hormone your adrenal glands produce alongside cortisol. Aldosterone's job is to tell your kidneys to hold onto sodium and water. Researchers documented a consistent symptom cluster tied to low aldosterone: salt cravings, muscle weakness, fatigue, dizziness when standing up, and low blood pressure. It's worth noting this research focuses on a diagnosed medical condition called primary adrenal insufficiency, not the milder, subclinical pattern many people experience day to day. Even so, it's useful because it maps out exactly what low aldosterone signaling looks like in the body when it's severe. That same symptom picture, salt cravings, weakness, and lightheadedness, is what functional practitioners commonly see show up at a lower, more subtle intensity in people whose adrenal signaling is simply running below its ideal capacity.

Study 3 (PMID 35897752):

This review examined how the HPA axis, your brain-adrenal stress system, and insulin, the hormone that moves sugar out of your blood and into your cells, interact with each other. The relationship runs in both directions. Cortisol influences how much insulin your pancreas releases, and it also affects how well your cells respond to the insulin that's already circulating. When cortisol rhythm is chronically disrupted, whether it's running too high, too low, or simply out of its normal daily pattern, that disruption changes how your body regulates blood sugar over time. This is a pattern connected to the earlier, quieter stages of metabolic syndrome, well before diabetes or prediabetes ever shows up on a standard lab panel, which is exactly why stress chemistry deserves a seat at the table in blood sugar conversations.



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Functional Medicine Connections:

Here's how these pieces fit together: your adrenal system isn't a standalone gland doing its own thing. It's wired into your body's communication network, touching blood sugar regulation, fluid balance, and immune signaling all at once. Think of cortisol less like a single hormone and more like a conductor, setting the tempo for dozens of other processes throughout the day. When your cortisol rhythm inverts, low in the morning, spiking again at night, your body loses the clean daily signal that's supposed to coordinate all of these systems together.

That's why a morning energy crash, a 3 PM sugar craving, a salty-snack habit you can't shake, and getting sick more easily can all trace back to the same disrupted rhythm, even though conventional care usually treats them as four unrelated problems, each sent to a different specialist with a different prescription.

This is also why the HPA axis rarely acts alone. Blood sugar swings put more demand on cortisol to step in and stabilize things, which pulls resources away from immune regulation. A weakened immune response means more frequent illness or inflammation, which itself becomes another stressor the HPA axis has to manage. Low aldosterone compounds the picture further, since sodium and fluid imbalances affect blood pressure and energy availability too.

Practical Reflections & Takeaways:

Think about your own patterns: Does your energy crash line up with skipped meals, poor sleep, or high-stress stretches? Do you notice a salt craving alongside those energy dips, or dizziness when you stand up quickly?

It can also help to look at timing. Are your worst symptoms clustered in the morning, or do they show up later in the day and into the evening? Does a stretch of good sleep noticeably soften them, even for a day or two? Patterns like these are clues about where in the daily cortisol arc your signaling may be struggling the most.

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