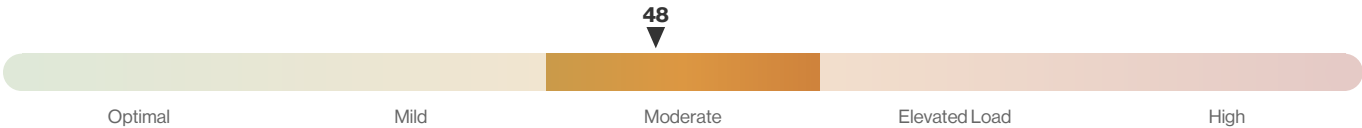


Patient: **Jordan Sample** | SID: **HMA-SAMPLE-001** | DOB: **1985-04-12** | Practitioner: **Dr. Morgan Ellis, ND (9000)**

ELEMENTAL BURDEN INDEX	48 /100	Moderate	Score range 40-60
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An EBI of 48/100 places this profile in the Moderate band — a meaningful burden now distributed across several domains rather than confined to one. At this level the body's compensatory mechanisms are beginning to show measurable strain, and more than one domain is contributing materially to the total score. The pattern often reflects interacting signatures — for instance a stress/adrenal electrolyte shift alongside reduced nutritional reserves — where one domain's load amplifies another's. The most actionable read therefore comes from the per-domain breakdown: the highest-scoring buckets and their flagged parameters indicate not only where the burden sits but where support is likely to have the greatest downstream effect. A structured, domain-sequenced plan — addressing the heaviest-loaded domain first while monitoring the others — is appropriate at this level. A retest to gauge response and confirm whether the overall burden is resolving or continuing to build is an important part of that plan.

SECTION SUMMARY

SECTION DETAILS		SCORE
A Stress & Adrenal Load Evaluates autonomic and adrenal capacity through sodium, potassium, and key mineral ratios. Determines whether the body is in sustained stress overdrive or has depleted its stress reserves, compromising resting and repair capacity.		13/25 Altered
B Nutritional Reserves Assesses the body's mineral resource bank across calcium, magnesium, selenium, iron, zinc, and other essential elements, identifying whether adequate supply is available or the system is rationing to only the most critical organs.		20/25 Markedly Low
C Environmental Metal Load Identifies interference from environmental heavy metals including mercury, lead, cadmium, arsenic, and aluminium that act as metabolic blockers. Metals are classified by cytotoxicity (Class A) or cumulative burden (Class B), scored to elevation severity.		0/25 Clean
D Metabolic Efficiency Examines how effectively the body is producing and utilising cellular energy through thyroid ratios, mitochondrial cofactors, and structural mineral patterns. Identifies whether metabolism is optimal or has entered a low-power state.		5/15 Reduced
E Hormonal Terrain Evaluates hormonal signalling capacity through zinc-copper balance, calcium-magnesium dynamics, and trace element status, detecting receptor blockades or resistance affecting metabolic and reproductive pathways.		10/10 Markedly Altered

Disclaimer. This report contains information derived from a composite model that aggregates licensed and non-licensed mineral indicators. It is not intended to diagnose, treat, cure, or prevent any disease or medical condition. In addition to the model's scoring framework, this report contains information drawn from published scientific literature provided for the information and research purposes of the ordering practitioner. The EBI does not form part of any licensed laboratory report. Always consult a qualified healthcare professional for personalised medical guidance.

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The Elemental Burden Index aggregates findings across five domains. Each section below indicates which criteria fall within the range of concern for this patient.

A Stress & Adrenal Load		13 / 25 Altered	
Elevated Na-K Activity Pattern	▲	Ca:Mg Regulatory Ratio	–
Na-K Reserve Pattern	–	Calcium Accumulation Pattern	–
Extreme Na-K Activity Pattern	▲	Ca:P Metabolic Interplay	–
Very Low Potassium Pattern	–	Zn:Cu Oxidative Interplay	▲
Sodium-Potassium Inversion Pattern	–	Multi-Mineral Depletion Pattern	–
Na/K Low Ratio	–	Parasympathetic-Tone Mineral Pattern	–
Na/K Elevated Ratio	–	Sympathetic-Tone Mineral Pattern	–
Na:Mg Regulatory Ratio	–		
B Nutritional Reserves		20 / 25 Markedly Low	
Calcium Low	–	Phosphorus Low	–
Calcium Elevated	–	Phosphorus Elevated	▲
Magnesium Low	–	Calcium-Magnesium Ratio Imbalance	–
Magnesium Elevated	▲	Zinc Low	▲
Selenium Low	–	Zinc Elevated	–
Selenium Elevated	–	Copper Low	▲
Iron Low	▲	Copper Elevated	–
Iron Elevated	–	Manganese Low	–
Sulphur Low	▲	Manganese Elevated	–
Sulphur Elevated	–		
C Environmental Metal Load		0 / 25 Clean	
Mercury Burden	–	Antimony Burden	–
Lead Burden	–	Aluminium Burden	–
Cadmium Burden	–	Nickel Burden	–
Arsenic Burden	–	Barium Burden	–
Uranium Burden	–	Bismuth Burden	–
D Metabolic Efficiency		5 / 15 Reduced	
Calcium-Magnesium Excess Pattern	▲	P Substrate Interplay	–
Ca-Mg Low Concurrent Pattern	–	Cu Cofactor Interplay	▲
Three-Mineral Low Concurrent Pattern	–	Mn Activity Interplay	–
Ca:P Metabolic Interplay	–	Phosphate Excess Indicator	▲
Ca:K Activity Interplay	–	Cr:Ca/Mg Regulatory Interplay	–
Se Cofactor Interplay	–	Four-Mineral Low Concurrent Pattern	–
Mg Activation Interplay	–		
E Hormonal Terrain		10 / 10 Markedly Altered	
Zinc Imbalance	▲	B Cofactor Interplay	–
Ca:Mg Regulatory Interplay	–	Cu Cofactor Interplay	▲
Zn:Cu Ratio Interplay	▲	Na-K Concurrent Activity Pattern	▲

▲ Range of Concern, flagged based on the patient's results. – Within Range, does not currently present a concern.

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RESEARCH-DERIVED CONSIDERATIONS

The following considerations are drawn from published scientific literature and are provided for the research and educational purposes of the ordering practitioner. They do not constitute clinical recommendations.

A

Stress & Adrenal Load

13 / 25 Altered

Observations

At this level the sodium-to-potassium and calcium-to-magnesium signatures point to an adrenal/electrolyte pattern under measurable strain, sitting in a transitional zone between compensation and depletion. Several ratios are now flagged concurrently, which reads as sustained loading rather than a one-off. The pattern is best interpreted against clinical history and the pace of the patient's mineral turnover.

General Considerations (3 indicators flagged)

Research has noted potassium-rich whole foods, magnesium-containing dietary patterns, and reduced stimulant load as factors associated with supporting electrolyte homeostasis in patterns resembling sympathetic dominance. Literature describes B-vitamin cofactors, particularly B5 and B6, as relevant to adrenal substrate availability, with absorption dynamics noted as sensitive to gut mucosal integrity. Zinc-copper oxidative balance, flagged via M12, has been associated in published reports with adrenal-immune crosstalk, and calcium accumulation patterns consistent with M10 have been noted alongside magnesium insufficiency in cross-sectional HMA data.

Elevated Na-K Activity Pattern. Potassium-rich whole foods alongside magnesium-supportive nutrition noted in research as relevant to mineralocorticoid-driven cellular electrolyte handling.

Extreme Na-K Activity Pattern. Sodium and potassium dietary balance alongside adrenal-supportive nutrition noted in research as relevant to sustained mineralocorticoid output at extreme hair thresholds.

Zn:Cu Oxidative Interplay. Zinc-rich whole foods alongside liver-supportive nutrition for copper clearance noted in research as relevant to Zn/Cu ratio balance at intestinal absorption sites.

B

Nutritional Reserves

20 / 25 Markedly Low

Observations

At this level the calcium, magnesium, sulphur, phosphorus, and trace-mineral signatures together read as a markedly low nutritional-reserve pattern, with multiple structural and cofactor minerals flagged at once and the reserve picture appearing stretched beyond its usual range. The zinc-copper and calcium-magnesium signals are moving in concert rather than offsetting each other, reinforcing rather than softening the read. The findings are most informative when weighed across all five domains before any prioritisation.

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General Considerations (6 indicators flagged)

Research has noted that patterns consistent with multi-mineral depletion may be associated with impaired cofactor availability for enzymatic processes dependent on zinc, magnesium, and selenium concurrently. Magnesium-rich whole food sources and sulphur-containing amino acid precursors have been described in literature as relevant to repletion dynamics at this severity level. Published data note that calcium-magnesium ratios outside the 4:1 to 7:1 hair reference range may reflect competing absorption dynamics rather than absolute deficiency of either element alone. Monitoring cadence of 90-120 days has been noted in HMA literature as supportive for tracking directional change in multi-element depletion patterns.

Magnesium Elevated. Magnesium-rich whole foods alongside cofactors supporting intracellular retention - B6, taurine, potassium - noted in literature as relevant where tissue loss rather than dietary excess appears operative.

Iron Low. Heme iron sources including organ meats, red meat, and shellfish alongside co-factors such as vitamin C and copper noted in research as supporting peripheral iron delivery and follicular incorporation.

Sulphur Low. Methionine and cysteine-rich whole foods alongside transsulphuration cofactors including B6, B12, and folate noted in literature as supporting SAA availability and keratin sulfur repletion.

Phosphorus Elevated. Reducing phosphate additive exposure through processed and ultra-processed foods noted in research as relevant, as chronic dietary phosphate loading has been described as a driver of tissue-level phosphorus accumulation distinct from organic whole-food phosphorus sources.

Zinc Low. Zinc-rich whole foods including shellfish, red meat, pumpkin seeds, and legumes noted in research as supporting tissue repletion, with phytate-containing foods identified in literature as relevant to absorption competition at intestinal sites.

Copper Low. Organ meats, shellfish, and legumes as copper-dense whole food sources noted in research as supporting tissue repletion, alongside attention to zinc-to-copper ratio at intestinal absorption sites.

Environmental Metal Load

0 / 25 Clean

Observations

At this level the mercury, lead, cadmium, arsenic and the wider toxic-element signatures read as a broadly clean environmental-burden pattern, with no single metal standing out against its reference limit. The picture is most consistent with background-level exposure rather than active tissue accumulation. Any flagged item here is best read as a watch-point alongside the wider elemental picture, not a priority on its own.

General Considerations (0 indicators flagged)

Research has noted that even sub-threshold metal readings may warrant contextual review alongside dietary patterns, as phytate-rich and processed food environments appear associated with gradual aluminium and nickel accumulation over time. Sulfur-containing amino acid sources, alongside selenium and zinc-rich whole foods, have been described in literature as relevant to maintaining metallothionein and glutathione-mediated buffering capacity. Published data note that calcium and iron adequacy may reduce gastrointestinal uptake of lead and cadmium at low ambient exposures. Monitoring cadence in the Clean band may reasonably extend to annual reassessment absent new exposure signals.

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Metabolic Efficiency

5 / 15 Reduced

Observations

At this level the Ca:Mg and Ca:P signatures suggest a metabolic pattern that is still functioning but appears to be leaning on its reserve, with one of the cofactor or substrate minerals reading away from the efficient range. One or two indicators are beginning to move together rather than in isolation, hinting at early drag on energy turnover. The overall read is directional change worth tracking rather than an established shift.

General Considerations (3 indicators flagged)

Research has noted magnesium-rich whole food patterns, selenium-containing foods, and chromium-associated dietary sources as relevant to the mineral cofactor pathways flagged at this severity level. Literature describes selenium as a rate-limiting cofactor for deiodinase enzyme activity, with hair selenium depletion appearing associated with reduced T4-to-T3 conversion efficiency. Phosphate substrate availability and copper status have been noted in published reports as relevant to cytochrome c oxidase function and ATP yield. Factors noted in research as supportive of insulin sensitivity at this level include chromium-associated dietary patterns alongside calcium-magnesium balance strategies.

Calcium-Magnesium Excess Pattern. Magnesium-rich whole foods alongside cofactors supporting Na/K-ATPase function noted in research as relevant to cellular calcium extrusion efficiency in soft-tissue loading patterns.

Cu Cofactor Interplay. Zinc-to-copper dietary balance through shellfish, organ meats, and legumes noted in research as relevant to cuproenzyme saturation and cytochrome c oxidase cofactor availability.

Phosphate Excess Indicator. Dietary phosphate load from processed foods, cola beverages, and high-protein sources noted in research as relevant to tissue phosphate accumulation when renal phosphaturia or FGF-23 signaling may be insufficient.



Hormonal Terrain

10 / 10 Markedly Altered

Observations

At this level the zinc, zinc-to-copper, calcium-to-magnesium, boron, and copper signatures suggest a markedly altered mineral-support pattern, with the hormonal-cofactor terrain reading as substantially stretched and most parameters co-flagged. The concurrent sodium-potassium activity signal reinforces rather than softens that read, pointing to overlapping rather than isolated shifts. This is the pattern that most warrants being interpreted as one integrated picture, with monitoring guided by how many parameters are clustering together.

General Considerations (4 indicators flagged)

Research has noted that zinc-copper ratios in hair tissue appear associated with androgen-oestrogen signalling capacity, with ratios outside the 8:1 range described in HMA literature as potentially consistent with receptor modulation effects. Boron status has been

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noted in published studies as supportive of sex hormone bioavailability and calcium-magnesium partitioning. Magnesium-rich whole food patterns and dietary sources supporting cytochrome c oxidase function appear in literature as relevant to adrenal androgenic vitality. Cross-sectional data associate insulin sensitivity patterns with calcium-to-magnesium dynamics, suggesting these mineral relationships may be worth considering alongside adrenal and reproductive hormone indicators when interpreting a markedly altered hormonal terrain.

Zinc Imbalance. Zinc-rich whole foods including shellfish, red meat, pumpkin seeds, and legumes noted in research as supporting tissue zinc repletion relevant to insulin, gonadal, and adrenal receptor function.

Zn:Cu Ratio Interplay. Zinc-rich whole foods alongside liver-supportive nutrition for copper clearance noted in research as relevant to Zn/Cu ratio balance and steroidogenic pathway support.

Cu Cofactor Interplay. Shellfish, organ meats, and legumes alongside attention to zinc-copper absorption competition noted in research as relevant to cytochrome c oxidase cofactor availability.

Na-K Concurrent Activity Pattern. Adaptogenic and adrenal-supportive whole foods alongside magnesium and B-vitamin cofactors noted in research as relevant to sustained sympathetic-adrenal activation patterns.

Suggested Retest Cadence: 3 months

A 3-month reassessment is suggested given an Extreme Mineralocorticoid Activity pattern (hair Na at or above 600 ug/g, or hair K at or above 240 ug/g). This tissue signal may reflect sustained high-output adrenal drive, and a 3-month cadence aligns with the window needed to observe whether the acute-activation pattern is resolving or persisting.