

HAIR TISSUE MINERAL ANALYSIS RECOMMENDATIONS & REPORT

Name:

Test Date:

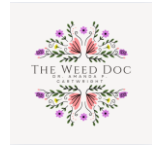
Hair Tissue Mineral Analysis (HTMA) is a screening tool that examines mineral and heavy metal levels in hair using mass spectroscopy. As hair grows, it absorbs metabolic products from extracellular fluids, blood, and lymph, which become trapped in the hair as it reaches the surface and hardens. While HTMA specifically measures elements in the hair, the results can be inferred for mineral status in other tissues throughout the body.

When conducted and interpreted correctly, this data provides valuable insights into mineral imbalances and metabolic activity that may not be revealed by other clinical tests, such as blood testing. The blood maintains relatively constant mineral levels to preserve homeostasis, often at the expense of mineral reserves in tissues. This means blood tests may not accurately reflect chronic mineral imbalances or long-term exposure to toxic metals, which accumulate in soft tissues like hair rather than the blood. HTMA provides a unique window into the cells and a more accurate view of long-term mineral and heavy metal accumulation, which offers insights that blood tests might miss.

Minerals are essential for maintaining overall health and are known as the "spark plugs" of the body, serving as cofactors in thousands of enzyme reactions, supporting muscle function, nutrient transfer, nerve conduction, and pH balance. Since minerals cannot be produced by the body and must be obtained through food, their importance is heightened by the growing depletion of minerals in our soil, which impacts the mineral content in our food.

This report is intended to assist you in understanding your HTMA results. Please reach out with any questions you have!

Disclaimer: *This summary is not intended to diagnose any condition or disease, nor should it be a substitute for a diagnosis from your medical care provider.*



HTMA Results Summary:

Your HTMA profile reveals patterns that may reflect an active stress response and shifts in mineral relationships that can influence how you feel day-to-day. The mineral balance seen here is often associated with experiences like muscle fatigue, cravings for salty snacks and chocolate, headaches, and changes in mood or energy—many of which you described. There are also trends connected to thyroid and adrenal dynamics, which can relate to symptoms such as frequent thirst, morning stiffness, skin irritation, and sensitivity to temperature. These patterns may impact both your physical comfort and overall resilience, and understanding them can offer practical steps to support your goals for better posture and maintaining health.

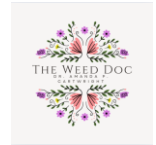
Dietary Recommendations

A Slow Oxidation diet focuses on gradually supporting metabolic activity by emphasizing balanced, nutrient-dense meals. This approach encourages moderate protein at each meal, a steady intake of mineral-rich carbohydrates such as potatoes, rice, or fruit, and moderate amounts of healthy fats like olive oil, butter, and avocado. You are advised to eat three consistent meals daily, starting within an hour of waking, and avoid prolonged fasting or skipping meals. The emphasis is on cooked, easily digested foods, with sodium and electrolytes included as needed, and a general avoidance of extreme fat-heavy or reduced-calorie diets. The goal is to stabilize blood sugar, support adrenal and thyroid activity, and promote steady energy without relying on reserves or restrictive eating patterns.

For you, this dietary approach aligns well with your existing habits of eating mostly home-grown foods and prioritizing hydration. Given your frequent muscle fatigue, cravings for chocolate and salty snacks, and digestive symptoms following gallbladder removal, focusing on balanced meals with moderate protein and well-cooked carbohydrates can help stabilize energy and reduce discomfort. Since you experience frequent thirst and urination, maintaining electrolyte balance is important—continue to salt your food to taste and include mineral-rich produce. Regular meals without long gaps can help address symptoms like headaches, anxiousness, and memory changes. By integrating these guidelines with your current practices, you can further support your body's mineral needs, posture, and overall health.

Supplement Recommendations

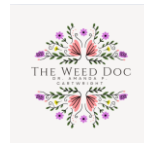
It is recommended to consume supplements to balance your minerals. The minerals you are currently lacking in are shown in my recommendations below. You can take these supplements (along with an electrolyte powder) over the counter but I do prefer a healthier option through a company called Vykon customs. They make a personalized supplement blend that is specific to



your needs. This is a custom powder that you can take either as a scoop mixed into liquid or encapsulated into multiple capsules per dose, typically taken twice daily. I order it through my practitioner account and have it shipped directly to you. If interested in this, please let me know.

Lifestyle Recommendations

Your current routine includes a thoughtful approach to hydration, whole food intake, and minimal caffeine, all of which provide a strong foundation for health. To further support your mineral balance and stress recovery, consider maintaining consistent sleep and gentle movement, especially first thing in the morning to help with stiffness and posture. Since you experience frequent muscle fatigue, memory issues, and headaches, regular gentle stretching or mindful movement practices such as yoga or walking may help encourage circulation and nervous system balance. Given your history of gallbladder removal and digestive symptoms, continue to prioritize simple, well-cooked foods and avoid skipping meals. Supporting your body's natural rhythms with consistent meal timing and hydration, while also taking time for daily relaxation or breathing exercises, can help reinforce your resilience and sense of well-being.



HTMA Results:

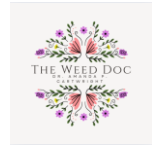
Metabolic Type:

You are currently in a Slow 1 metabolic pattern, which means your parasympathetic nervous system is dominant. This state is often characterized by decreased cellular activity of both the thyroid and adrenal glands, resulting in a slower metabolic rate. The stress stage you are in, known as 'Alarm,' suggests your body is actively responding to stress, which can make energy production less efficient. Your reported habits—such as drinking large amounts of water, eating mostly home-grown foods, and avoiding caffeine—fit well with this pattern, as these choices generally support your system but may not always provide the quick stimulation or metabolic push that a slow oxidizer needs. Symptoms like morning stiffness, muscle fatigue, and cravings for salty foods are commonly seen in this pattern and can be addressed by focusing on consistent meal timing, moderate protein, and supportive lifestyle routines.

Patterns:

High Na/K

This pattern may reflect an acute stress response and increased inflammation, as seen by a sodium to potassium ratio above the optimal range. In this context, it suggests that your body is actively managing stress and may be experiencing higher demands on adrenal and kidney function. Supporting electrolyte balance and managing stress through consistent nourishment and restorative practices is a helpful goal for optimizing this pattern.



Ratios:

Calcium/Phosphorus (Autonomic Balance): 4.93

ABOVE OPTIMAL

RATIO SIGNIFICANCE: Represents the balance between the parasympathetic ('rest and digest') and sympathetic ('fight or flight') branches of the autonomic nervous system, with this ratio reflecting parasympathetic dominance.

CLINICAL IMPACT: This may reflect a system that is more oriented toward rest, repair, and conservation of energy. This pattern is often associated with reduced drive and slower recovery from stress.

CONNECTION TO CONCERNS: This trend may be connected to your muscle fatigue, morning stiffness, and runny nose, as well as your tendency to feel better with gentle movement and consistent nourishment.

Sodium/Potassium (Vitality): 8.67

ABOVE OPTIMAL

RATIO SIGNIFICANCE: Reflects the electrical potential of cells, specifically the sodium (extracellular) to potassium (intracellular) dynamic that governs cellular energy and adrenal response; this ratio also connects to aldosterone, a key adrenal hormone.

CLINICAL IMPACT: This may reflect an active stress response and increased adrenal stimulation. This pattern is often associated with symptoms such as frequent thirst, cravings for salt, and heightened feelings of tension or anxiety.

CONNECTION TO CONCERNS: Your frequent thirst, cravings for salty snacks, racing heart, and muscle fatigue may be linked to this pattern, especially considering your high water intake and sensation of frequent urination.



Calcium/Potassium (Thyroid): 23

ABOVE OPTIMAL

RATIO SIGNIFICANCE: Reflects the sensitivity of tissues to thyroid hormone, with calcium regulated by thyroid hormone (via calcitonin) and potassium reflecting tissue responsiveness; when this ratio is above optimal, metabolic rate and energy production can decrease.

CLINICAL IMPACT: This may reflect reduced cellular uptake of thyroid hormone and decreased energy production. This pattern is often associated with symptoms such as fatigue, sluggishness, and difficulty recovering from stress.

CONNECTION TO CONCERNS: This relationship may be connected to your muscle weakness, morning stiffness, and feelings of reduced energy, as well as your experience of dry mouth and sensitivity to temperature.

Zinc/Copper (Hormonal Stress): 13.57

ABOVE OPTIMAL

RATIO SIGNIFICANCE: Reflects the balance between progesterone/testosterone and estrogen, with zinc supporting progesterone and testosterone, and copper influenced by estrogen; both are needed for antioxidant defense.

CLINICAL IMPACT: This may reflect a relative dominance of progesterone over estrogen, or increased antioxidant demand. This pattern is often associated with hormonal shifts, skin changes, and tissue repair needs.

CONNECTION TO CONCERNS: Your skin irritations, vaginal dryness, and memory changes may be linked to this relationship, as well as your chocolate cravings, which can sometimes reflect shifts in zinc and copper dynamics.



Sodium/Magnesium (Adrenal): 2.63

OPTIMAL

RATIO SIGNIFICANCE: Represents adrenal influence on metabolic rate, with aldosterone regulating sodium retention and magnesium modulating the stress response and adrenal resilience.

CLINICAL IMPACT: This may reflect a balanced interaction between adrenal output and magnesium status. This pattern is often associated with more stable energy and stress handling.

CONNECTION TO CONCERNS: This ratio suggests your current electrolyte and adrenal support are generally appropriate, aligning with your steady hydration and dietary choices.

Calcium/Magnesium (Blood Sugar): 6.97

OPTIMAL

RATIO SIGNIFICANCE: Represents insulin regulation and blood sugar balance, with calcium supporting insulin release and magnesium moderating excessive insulin output.

CLINICAL IMPACT: This may reflect stable blood sugar dynamics. This pattern is often associated with more consistent energy and mood.

CONNECTION TO CONCERNS: This ratio supports your efforts to stabilize energy and may help with symptoms like headaches and cravings.

Iron/Copper (Infection): 0.79

OPTIMAL

RATIO SIGNIFICANCE: Reflects cellular energy production and electron transport, with balance between iron and copper supporting normal cell function and energy metabolism.

CLINICAL IMPACT: This may reflect a balanced relationship for energy production and antioxidant defense. This pattern is often associated with stable immune function and tissue repair.

CONNECTION TO CONCERNS: This optimal ratio supports your goal of staying healthy and may help with tissue recovery and resilience.



Copper/Molybdenum (Copper Imbalance): 20

BELOW OPTIMAL

RATIO SIGNIFICANCE: Reflects the dynamic between copper and molybdenum, with molybdenum naturally opposing copper and imbalances here suggesting compensation or stress in detoxification pathways.

CLINICAL IMPACT: This may reflect altered detoxification or copper utilization. This pattern is often associated with symptoms like skin sensitivity and changes in connective tissue health.

CONNECTION TO CONCERNS: Your skin irritation and sensitivity to environmental exposures, such as aluminum cookware (even if covered with parchment paper), may be related to this mineral relationship.

Nutritional Elements:

Calcium: 69

OPTIMAL

SOURCES: Dairy, leafy greens, nuts, seeds, and mineral-rich water.

CLINICAL IMPACT: This may reflect balanced bone and nerve support. This pattern is often associated with stable muscle and nerve function.

CONNECTION TO CONCERNS: This helps support your posture and muscle comfort, especially given your history of dairy intake.

Magnesium: 9.9

ABOVE OPTIMAL

SOURCES: Leafy greens, nuts, seeds, whole grains, and supplementation.

CLINICAL IMPACT: This may reflect increased supplementation or tissue retention in response to stress. This pattern is often associated with muscle relaxation and nervous system support.

CONNECTION TO CONCERNS: Your current magnesium supplementation and muscle symptoms align with this finding, supporting your muscle and nerve function.



Sodium: 26

OPTIMAL

SOURCES: Obtained from table salt, salted foods, and naturally present in many vegetables.

CLINICAL IMPACT: This may reflect adequate sodium reserves for adrenal and hydration support. This pattern is often associated with stable blood pressure and energy.

CONNECTION TO CONCERNS: This aligns with your frequent thirst and salt cravings, supporting your current hydration practices.

Potassium: 3

BELOW OPTIMAL

SOURCES: Bananas, potatoes, leafy greens, fruits, and dairy.

CLINICAL IMPACT: This may reflect reduced intracellular hydration and nerve signal transmission. This pattern is often associated with muscle fatigue, frequent urination, and cravings for salt.

CONNECTION TO CONCERNS: Your frequent urination, muscle fatigue, and salt cravings may relate to this relationship, especially given your high water consumption and dietary patterns.

Copper: 1.4

BELOW OPTIMAL

SOURCES: Present in shellfish, nuts, seeds, and whole grains; also influenced by cookware and water supply.

CLINICAL IMPACT: This may reflect reduced copper availability for connective tissue and energy production. This pattern is often associated with fatigue and hormonal shifts.

CONNECTION TO CONCERNS: Your chocolate cravings, skin irritation, and hormonal symptoms may be related to this relationship, especially considering your cookware exposure.



Zinc: 19

ABOVE OPTIMAL

SOURCES: Found in red meat, shellfish, seeds, nuts, and whole grains.

CLINICAL IMPACT: This may reflect increased demand for tissue repair or antioxidant support. This pattern is often associated with skin health and immune function.

CONNECTION TO CONCERNS: This mineral level may be related to your skin irritation, chocolate cravings, and immune system support.

Phosphorus: 14

OPTIMAL

SOURCES: Meats, dairy, nuts, seeds, and whole grains.

CLINICAL IMPACT: This may reflect balanced support for energy production and bone health. This pattern is often associated with stable stamina and muscle function.

CONNECTION TO CONCERNS: This supports your goals for better posture and steady energy.

Iron: 1.1

OPTIMAL

SOURCES: Commonly found in red meat, leafy greens, legumes, and fortified foods.

CLINICAL IMPACT: This may reflect balanced iron status for oxygen transport and energy. This pattern is often associated with good tissue oxygenation and stamina.

CONNECTION TO CONCERNS: This supports your goal of maintaining health and may contribute to steady energy.

Manganese: 0.024

BELOW OPTIMAL

SOURCES: Nuts, seeds, whole grains, leafy vegetables, and tea.

CLINICAL IMPACT: This may reflect decreased support for antioxidant enzymes and connective tissue. This pattern is often associated with joint discomfort and skin sensitivity.

CONNECTION TO CONCERNS: Your morning stiffness and skin irritation may be connected to this trend, especially considering your diet.



Chromium: 0.04

OPTIMAL

SOURCES: Whole grains, meats, and some fruits and vegetables.

CLINICAL IMPACT: This may reflect balanced blood sugar regulation. This pattern is often associated with steady energy and mood.

CONNECTION TO CONCERNS: This supports your efforts to maintain stable energy and reduce cravings.

Selenium: 0.06

BELOW OPTIMAL

SOURCES: Brazil nuts, seafood, eggs, and grains (levels depend on soil content).

CLINICAL IMPACT: This may reflect reduced antioxidant enzyme activity and thyroid hormone support. This pattern is often associated with skin sensitivity and decreased resilience to stress.

CONNECTION TO CONCERNS: Your skin irritation and sensitivity to environmental exposures may be connected to this relationship, especially considering your well water and dietary sources.

Cobalt: 0.01

ABOVE OPTIMAL

SOURCES: Primarily from animal products, especially organ meats, and as a component of vitamin B12.

CLINICAL IMPACT: This may reflect increased B12-related activity or exposure. This pattern is often associated with nervous system and red blood cell support.

CONNECTION TO CONCERNS: This may relate to your experiences with memory changes and muscle fatigue.



Molybdenum: 0.07

ABOVE OPTIMAL

SOURCES: Legumes, grains, leafy vegetables, and drinking water.

CLINICAL IMPACT: This may reflect increased detoxification activity or exposure. This pattern is often associated with changes in energy and tissue repair needs.

CONNECTION TO CONCERNS: Your well water (because it was tested) isn't the problem. With J.D's molybdenum level high as well, it could be contributed to dietary habits (eating high amounts of organ meats, legumes, whole grains, and leafy vegetables), which can relate to your skin and digestive symptoms.

Sulfur: 4580

OPTIMAL

SOURCES: Eggs, garlic, onions, cruciferous vegetables, and protein-rich foods.

CLINICAL IMPACT: This may reflect good support for detoxification and tissue repair. This pattern is often associated with skin, joint, and liver health.

CONNECTION TO CONCERNS: This may be supportive for your skin and connective tissue health goals.

Toxic Elements:

Uranium: 0.0093

OPTIMAL

SOURCES: May be present in well water and certain geological areas.

CLINICAL IMPACT: This may reflect minimal exposure. This pattern is often associated with reduced toxic impact.

CONNECTION TO CONCERNS: This supports your health goals, particularly given your well water source.



Arsenic: 0.003

OPTIMAL

SOURCES: May be present in well water, rice, seafood, and certain pesticides.

CLINICAL IMPACT: This may reflect minimal exposure. This pattern is often associated with healthy detoxification.

CONNECTION TO CONCERNS: This supports your aim to stay healthy, especially considering your use of well water.

Beryllium: 0.001

OPTIMAL

SOURCES: Rare in food and water; industrial exposure possible.

CLINICAL IMPACT: This may reflect minimal exposure. This pattern is often associated with healthy detoxification.

CONNECTION TO CONCERNS: This is supportive for your overall health.

Mercury: 0.01

OPTIMAL

SOURCES: Seafood, dental fillings, and environmental exposure.

CLINICAL IMPACT: This may reflect minimal current exposure. This pattern is often associated with healthy detoxification.

CONNECTION TO CONCERNS: This is supportive for your overall well-being.

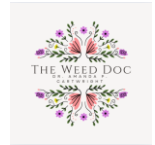
Cadmium: 0.001

OPTIMAL

SOURCES: Present in some foods, tobacco smoke, and industrial pollution.

CLINICAL IMPACT: This may reflect minimal current exposure. This pattern is often associated with reduced toxic stress.

CONNECTION TO CONCERNS: This supports your efforts for long-term health.



Lead: 0.1

OPTIMAL

SOURCES: Can be found in older plumbing, soil, or certain cookware.

CLINICAL IMPACT: This may reflect minimal current exposure. This pattern is often associated with reduced toxic burden.

CONNECTION TO CONCERNS: This is supportive for your overall health goals.

Aluminum: 0.4

OPTIMAL

SOURCES: Cookware, foil, processed foods, and water.

CLINICAL IMPACT: This may reflect manageable exposure. This pattern is often associated with healthy tissue function.

CONNECTION TO CONCERNS: Your use of parchment-lined aluminum cookware may help minimize this exposure.

Additional Elements:

Germanium: 0.001

OPTIMAL

SOURCES: Trace in some plant foods and water.

CLINICAL IMPACT: This may reflect minimal exposure. This pattern is often associated with healthy detoxification.

CONNECTION TO CONCERNS: This is supportive for your overall health.



Barium: 0.1

OPTIMAL

SOURCES: Environmental exposure, well water, and certain foods.

CLINICAL IMPACT: This may reflect minimal exposure. This pattern is often associated with healthy mineral balance.

CONNECTION TO CONCERNS: This supports your efforts to maintain health with well water.

Bismuth: 0.001

OPTIMAL

SOURCES: Medications and trace presence in water and soil.

CLINICAL IMPACT: This may reflect minimal exposure. This pattern is often associated with healthy detoxification.

CONNECTION TO CONCERNS: This supports your overall health.

Rubidium: 0.0033

OPTIMAL

SOURCES: Trace amounts in plant foods and water.

CLINICAL IMPACT: This may reflect balanced exposure. This pattern is often associated with stable mineral balance.

CONNECTION TO CONCERNS: This is supportive for your health goals.

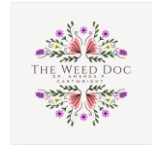
Lithium: 0.001

BELOW OPTIMAL

SOURCES: Trace levels in water, grains, and vegetables.

CLINICAL IMPACT: This may reflect reduced support for mood and nervous system balance. This pattern is often associated with emotional sensitivity and changes in mood.

CONNECTION TO CONCERNS: Anxiety and memory issues may be connected to this relationship.



Nickel: 0.03

OPTIMAL

SOURCES: Stainless steel cookware, plant foods, and water.

CLINICAL IMPACT: This may reflect manageable exposure. This pattern is often associated with healthy tissue function.

CONNECTION TO CONCERNS: This supports your health goals, given your use of stainless steel cookware.

Platinum: 0.001

OPTIMAL

SOURCES: Rare, with trace presence in the environment.

CLINICAL IMPACT: This may reflect minimal exposure. This pattern is often associated with healthy detoxification.

CONNECTION TO CONCERNS: This supports your overall health.

Thallium: 0.0001

OPTIMAL

SOURCES: Trace presence in soil and water.

CLINICAL IMPACT: This may reflect minimal exposure. This pattern is often associated with healthy detoxification.

CONNECTION TO CONCERNS: This supports your overall health.

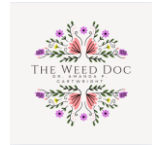
Vanadium: 0.003

OPTIMAL

SOURCES: Shellfish, mushrooms, black pepper, and grains.

CLINICAL IMPACT: This may reflect balanced intake. This pattern is often associated with healthy metabolic function.

CONNECTION TO CONCERNS: This supports your health maintenance goals.



Strontium: 0.2

OPTIMAL

SOURCES: Mineral water, seafood, and leafy greens.

CLINICAL IMPACT: This may reflect balanced intake. This pattern is often associated with bone and dental health.

CONNECTION TO CONCERNS: This supports your posture and bone health goals.

Tin: 0.01

OPTIMAL

SOURCES: Canned foods, some cookware, and environmental exposure.

CLINICAL IMPACT: This may reflect minimal current exposure. This pattern is often associated with healthy tissue function.

CONNECTION TO CONCERNS: This supports your health goals.

Titanium: 0.07

OPTIMAL

SOURCES: Environmental exposure, pigments, and trace foods.

CLINICAL IMPACT: This may reflect manageable exposure. This pattern is often associated with healthy tissue function.

CONNECTION TO CONCERNS: This supports your health goals.

Tungsten: 0.001

OPTIMAL

SOURCES: Trace amounts in water and soil.

CLINICAL IMPACT: This may reflect minimal exposure. This pattern is often associated with healthy detoxification.

CONNECTION TO CONCERNS: This is supportive for your overall well-being.



Zirconium: 0.03

OPTIMAL

SOURCES: Trace in soil and water.

CLINICAL IMPACT: This may reflect minimal exposure. This pattern is often associated with healthy detoxification.

CONNECTION TO CONCERNS: This is supportive for your health maintenance goals.

Discussion/Recommendations:

Cobalt

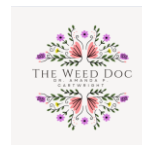
High cobalt and high molybdenum together are interesting. These two don't typically elevate together. Possible sources include other supplements or being around certain ceramics (possible flooring?). Sometimes other nutrient supplements have cobalt included. Your elevated cobalt at 0.010 is probably liver congestion from your stress state. Both elevated together suggest you are in an active loss or mobilization phase, likely driven by your adrenals working overtime.

Molybdenum

When molybdenum gets high, it's usually in what I'd call a loss pattern. What's interesting is that molybdenum has a relation to estrogen metabolism. It's also relevant in protocols where people have mold, candida, or ammonia excess. Your elevated molybdenum at 0.070 is very likely part of a copper-dumping pattern and when someone's under stress (which your Na/K ratio shows), molybdenum can rise as the body tries to mobilize copper out.

Mineral Ratio's

This is a striking pattern. Your Ca/Mg ratio of 6.97 is solid but your Na/K ratio of 8.67 is elevated, pointing to acute stress or inflammation. Your sodium at 26 is actually reasonable, but



your potassium at 3 is critically low. These levels indicate a runny nose and brain fog. Low potassium creates nervous system irritability, poor circulation to the brain, and sinus inflammation. It's not just electrolytes; it's how you're mobilizing minerals under stress.

What I'd prioritize if these were my results:

First, Potassium and Sodium. If these are brought to good levels, you'll likely see both the cobalt and molybdenum begin to settle as your stress pattern resolves. Second, your copper-to-molybdenum ratio is 20, which is actually fine but supporting your liver and adrenals will likely cause the copper to stabilize.

Your magnesium at 9.9 is also on the lower side. With that Na/K picture and your symptoms, you likely need both potassium and magnesium repletion through diet and/or supplementation.

I would add a potassium-based electrolyte mix daily and make sure to take your magnesium glycinate supplement every night without missing a dose. Also, try to get as much of these nutrients in through diet. Consume leafy greens, avocado, coconut water, pumpkin seeds, chia seeds, spinach, and almonds if possible. Consume at least one teaspoon (spread throughout the day) of Redmon's real salt (which I believe you mentioned you do use) to help your sodium levels. Your Na/K ratio will drop once potassium comes up, and that alone should quiet the runny nose and brain fog.

I would also add digestive bitters before meals. I personally do this and use a gentian root tincture. Just a few drops under the tongue about ten minutes before meals. It helps get your stomach primed for food and helps metabolism. It supports your liver to process out the cobalt and helps absorb what you are eating.

I do suggest retesting your mineral levels in 3 months to see if your Na/K ratio normalizes and your stress pattern settle. The cobalt and molybdenum will likely come down on their own as your adrenals recover.

If you have questions, please let me know.

~Dr. Amanda P. Cartwright

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