Introduction to Hair Tissue Mineral Analysis (HTMA)

HTMA is a powerful diagnostic tool that measures mineral levels in hair tissue. It reveals metabolic patterns that blood tests often miss.

Scientific Foundation

Developed by Dr. Paul Eck, refined by Dr. Lawrence Wilson.

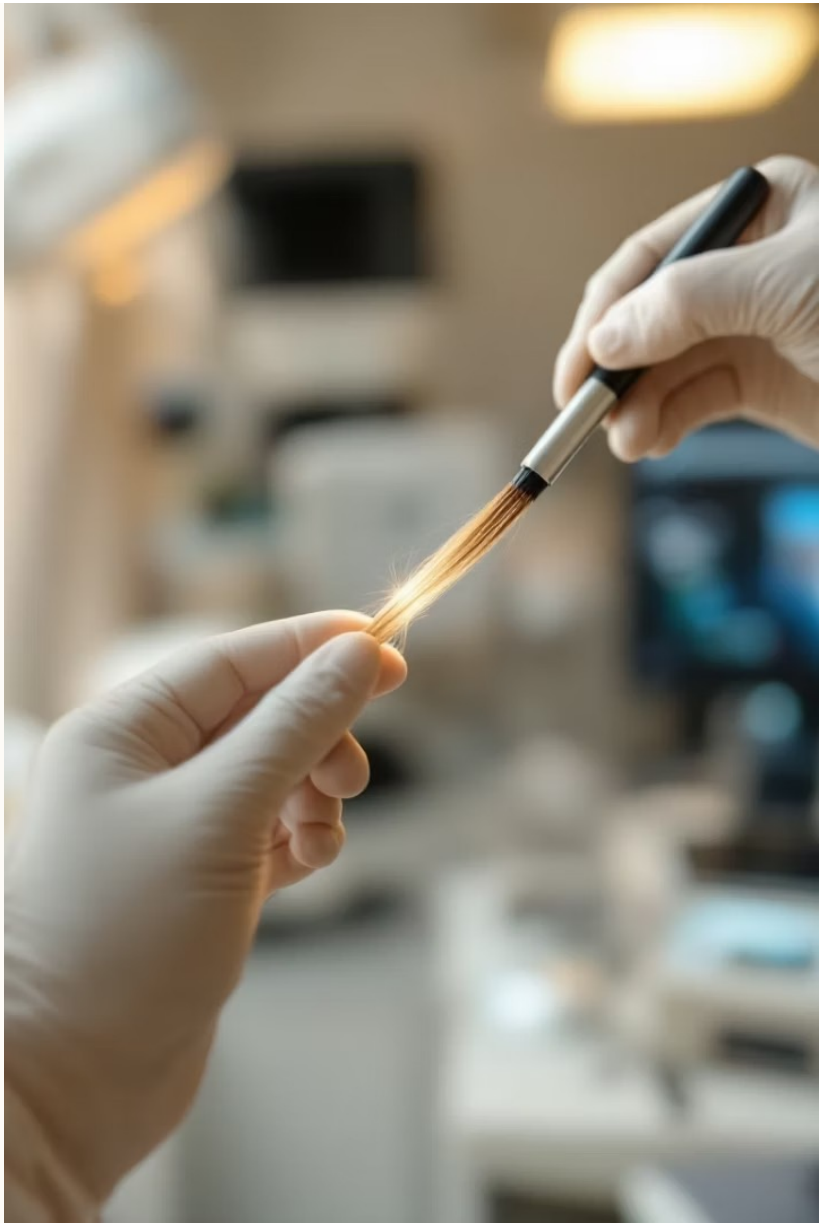
Mineral Balancing

Identifies key ratios between minerals that affect health.

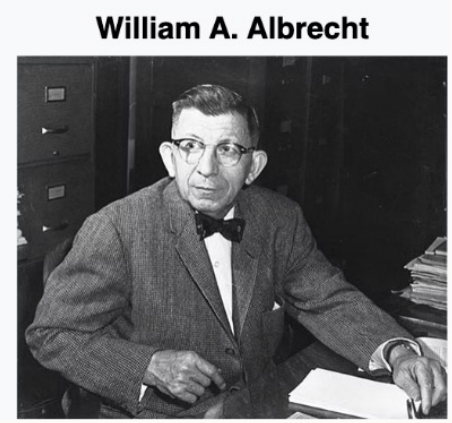
Metabolic Typing

Classifies metabolism into patterns that guide personalized protocols.

by Lauren Keller, APRN, CNM



The History



Dr. William Albrecht

He was the foremost authority on the relation of soil fertility to human health

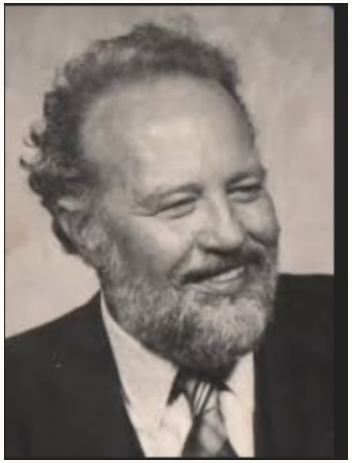
He saw a direct link between soil quality, food quality and human health. He drew direct connections between poor quality forage crops, and ill health in livestock and from this developed a formula for ideal ratios of cations in the soil, that MB uses today.

Albrecht was outspoken on matters of declining soil fertility, having identified that it was due to a lack of organic material, major elements, and trace minerals, and was thus responsible for poor crops and in turn for pathological conditions in animals fed deficient foods from such soils.

He laid the blame as:

"NPK formulas, (nitrogen, phosphorus, potassium) as legislated and enforced by State departments of Agriculture mean malnutrition, attack by insects, bacteria and fungi, weed takeover, crop loss in dry weather, and general loss of mental acuity in the population, leading to degenerative metabolic disease and early death" (Wikipedia)

The Pioneers



Dr. Paul Eck

Pioneered mineral testing protocols in the 1970s. Identified key mineral ratios that reflect metabolic patterns. Determined those ratios using Dr. Albrecht's work.

Established the foundation of HTMA interpretation and mineral balancing therapy.

Dr. Lawrence Wilson

Expanded Dr. Eck's work. Developed comprehensive healing protocols beyond mineral supplementation.

Authored definitive guides on nutritional balancing science and a robust website of information available for free. Some have criticized him for his more esoteric beliefs.

The New Healing Paradigm

Whole System Thinking

Viewing the body as one complex, self-regulating system rather than isolated parts. This approach recognizes the subtle connections between all body systems.

Focus on Modern Causes

Addressing mineral deficiencies, toxic metals, electromagnetic pollution, and other 21st century health challenges that conventional medicine often overlooks.

Wellness-Based

Defining health as high resistance to disease rather than merely the absence of diagnosable illness. This creates a state of natural health rather than artificial health. It also focused on not using a "pill for every ill" which is common in functional medicine.

Ionic mimicry

- Selenium= mercury
- Zinc, iron, calcium = cadmium
- Silicon or phosphorous = arsenic
- Calcium, magnesium, iron, silicon = aluminum
- Iron, zinc, phosphorous = lead
- Chromium, zinc, magnesium = nickel

Examples of why MB is the foundation- whole systems thinking

- In order cells to produce energy, they use a process called phosphorylation. This process involves adding phosphate groups (which contain PHOSPHOROUS) to ADP to be converted to ATP (energy).
- To break down histamine, we need the DAO enzyme and HNMT (histamine-N-methyltransferase). What do we need to make these enzymes? We need COPPER, vitamin C and B6 (vitamin cofactors to the minerals).
- What do we need to produce cortisol (an adrenal stress hormone)? Sodium! Low sodium levels can results in elevated cortisol and therefore lower levels of circulating sex hormones leading to anovulation.

> "Sodium intake <1,500mg (risk ratio [RR] 2.70, 95% confidence interval [CI] 1.00, 7.31) and manganese intake <1.8mg (RR 2.00, 95% CI 1.02, 3.94) were associated with an increased risk of anovulation, compared to higher intakes respectively."

Kim K, Wactawski-Wende J, Michels KA, Schliep KC, Plowden TC, Chaljub EN, Mumford SL. Dietary minerals, reproductive hormone levels and sporadic anovulation: associations in healthy women with regular menstrual cycles. Br J Nutr. 2018 Jul;120(1):81-89. doi: 10.1017/S0007114518000818. Epub 2018 Apr 20. PMID: 29673411; PMCID: PMC6019139.

But is a HTMA actually accurate?

The Tissue Biopsy Principle

Hair Analysis is a Tissue Test

Measures minerals only in hair cells and interstitial spaces, not the entire body or other organs

Not a Total Body Assessment

Cannot and does not measure total body load of any mineral

Represents a Mineral System

Readings show a balanced system where minerals compensate for each other (e.g., low zinc may balance high sodium)

A common error among practitioners is assuming that high or low readings reflect total body mineral status. Instead, hair analysis reveals patterns that allow us to infer information about mineral metabolism and stress response. This makes direct comparisons with blood tests or other mineral assessments problematic.

Why Total Body Load Is Less Relevant

Bioavailability Matters More

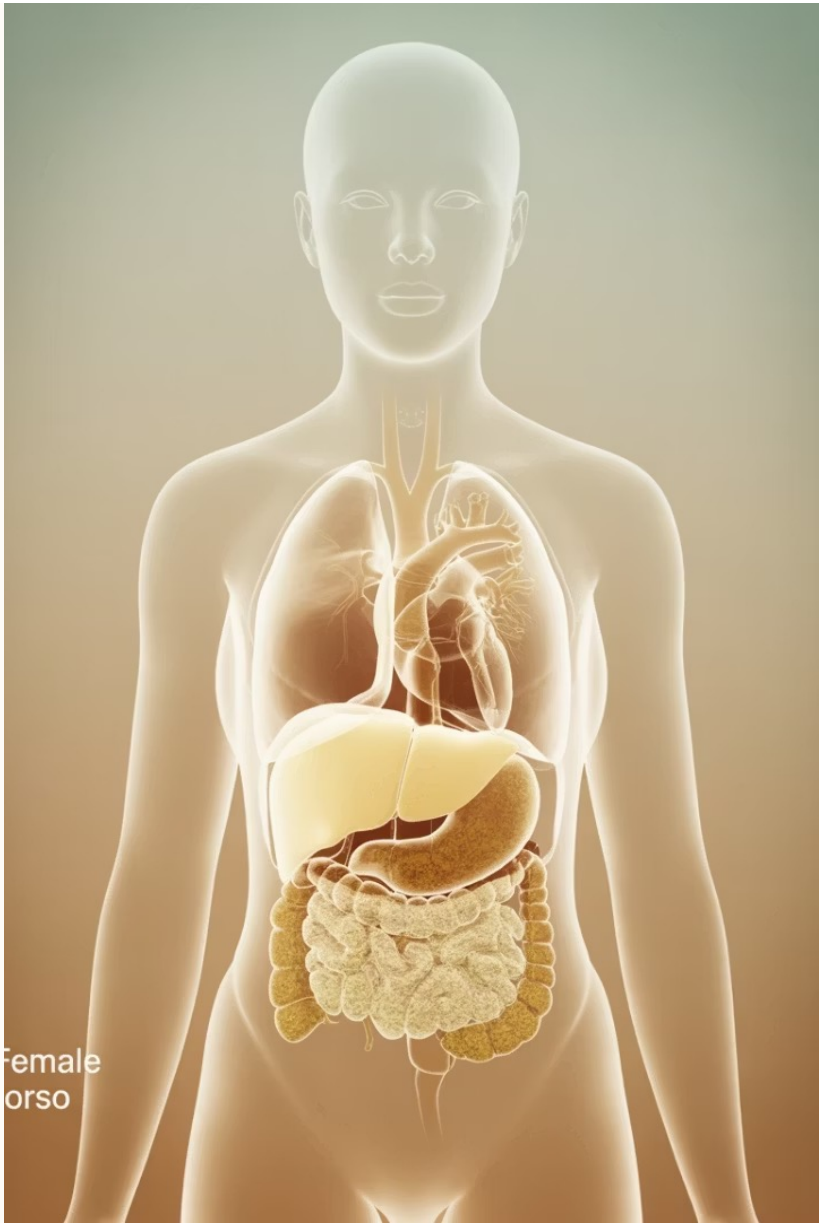
The mere presence of a mineral is less important than whether it's in a bioavailable form that can be properly utilized by the body.

Location Is Critical

Even with toxic metals, location matters more than quantity. A small amount of cadmium in the kidneys or brain is more problematic than larger amounts stored in bones.

Technological Limitations

Current technology cannot accurately assess total body mineral load, as this would require biopsying every cell and organ.



Bioavailability Implications

1. **Utilization Matters More Than Intake**

   What the body can use is more important than what is consumed

2. **Explains Rapid Level Changes**

   Mineral levels can jump from low to high without supplementation when bioavailability improves

3. **Guides Nutritional Balancing**

   Proper supplementation aims to improve mineral bioavailability, not just increase total amounts

4. **Reveals Hidden Imbalances**

   Helps identify minerals that are present but sequestered or unavailable

The Averaging Principle

Hair Growth Period

Each sample represents 8-12 weeks of hair growth

Average Accumulation

Readings show average mineral deposition over the sampling period

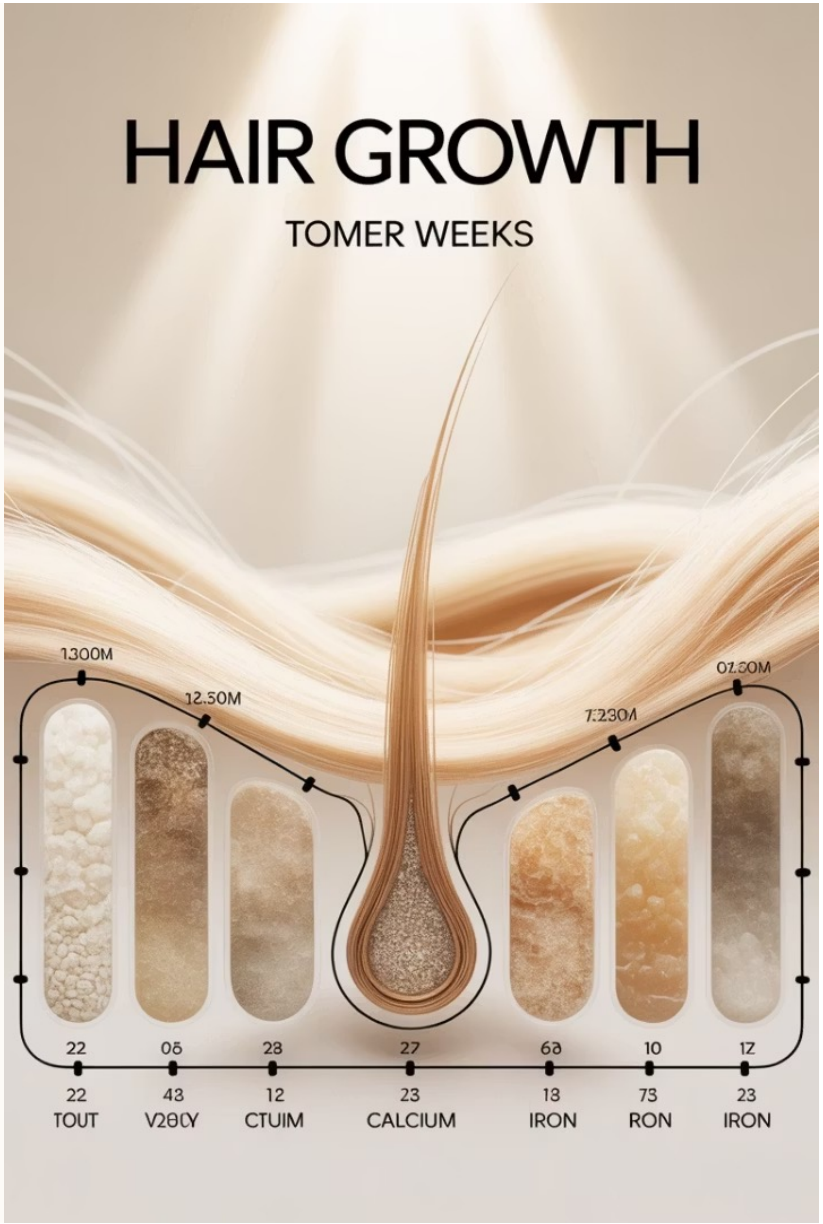
Day-to-Day Variations

Cannot detect daily fluctuations in mineral levels

Long-Term Trends

Better at revealing patterns over time than instantaneous status

This principle explains why identical readings on successive tests may have different meanings. For example, a copper level of 4 mg% might represent an increasing trend on one test but a decreasing trend on a follow-up test, despite the identical average reading.



Problems with Minerals Today

Depleted Soils

Most areas of the world have soils low in minerals because they have been farmed too much and incorrectly.

Food Processing

The refining of table salt, white flour, and white rice makes mineral deficiencies much worse globally.

Impaired Digestion

Improper eating habits, food additives, and intestinal infections further reduce mineral absorption. The overuse of antibiotics effects the microbiome leading to absorption challenges.

Additional factors include parasitic infections, congenital deficiencies passed from mothers to babies, and stress. These problems combine to create widespread mineral imbalances that affect virtually everyone today.

Therapeutic Principles

Enhancing Adaptive energy or vitality

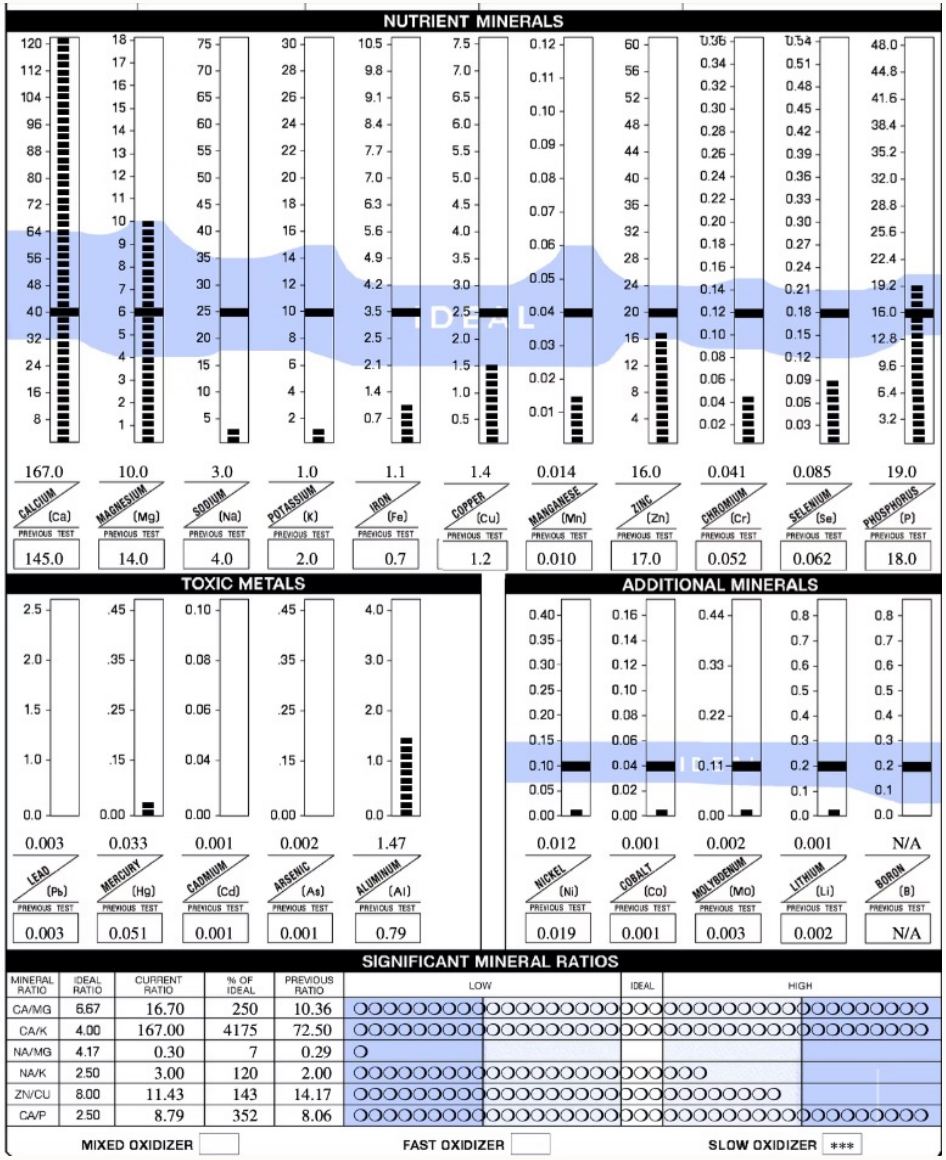
As vitality improves, the body is able to heal all imbalances and diseases.

Replacing less preferred minerals with preferred minerals.

These are specific nutrients in specific ratios based on a person's ratios and oxidation rate that will slowly restore enzyme strength and vitality in the body.

Body Balancing

Because we are working on the mineral system of the body which is the basis to EVERY single system, we can alter and improve EVERY single system regardless of where there is dysfunction.


NUTRIENT MINERALS
IDEAL
CALCIUM (Ca) 167.0 PREVIOUS TEST 145.0
MAGNESIUM (Mg) 10.0 PREVIOUS TEST 14.0
SODIUM (Na) 3.0 PREVIOUS TEST 4.0
POTASSIUM (K) 1.0 PREVIOUS TEST 2.0
IRON (Fe) 1.1 PREVIOUS TEST 0.7
COPPER (Cu) 1.4 PREVIOUS TEST 1.2
MANGANESE (Mn) 0.014 PREVIOUS TEST 0.010
ZINC (Zn) 16.0 PREVIOUS TEST 17.0
CHROMIUM (Cr) 0.041 PREVIOUS TEST 0.052
SELENIUM (Se) 0.085 PREVIOUS TEST 0.062
PHOSPHORUS (P) 19.0 PREVIOUS TEST 18.0
TOXIC METALS
LEAD (Pb) 0.003 PREVIOUS TEST 0.003
MERCURY (Hg) 0.033 PREVIOUS TEST 0.051
CADMIUM (Cd) 0.001 PREVIOUS TEST 0.001
ARSENIC (As) 0.002 PREVIOUS TEST 0.001
ALUMINUM (Al) 1.47 PREVIOUS TEST 0.79
ADDITIONAL MINERALS
NICKEL (Ni) 0.012 PREVIOUS TEST 0.019
COBALT (Co) 0.001 PREVIOUS TEST 0.001
MOLYBDENUM (Mo) 0.002 PREVIOUS TEST 0.003
LITHIUM (Li) 0.001 PREVIOUS TEST 0.002
BORON (B) N/A PREVIOUS TEST N/A
SIGNIFICANT MINERAL RATIOS
MINERAL RATIO | IDEAL RATIO | CURRENT RATIO | % OF IDEAL | PREVIOUS RATIO | LOW | IDEAL | HIGH
CA/MG | 6.67 | 16.70 | 250 | 10.36
CA/K | 4.00 | 167.00 | 4175 | 72.50
NA/MG | 4.17 | 0.30 | 7 | 0.29
NA/K | 2.50 | 3.00 | 120 | 2.00
ZN/CU | 8.00 | 11.43 | 143 | 14.17
CA/P | 2.50 | 8.79 | 352 | 8.06
MIXED OXIDIZER
FAST OXIDIZER
SLOW OXIDIZER ***

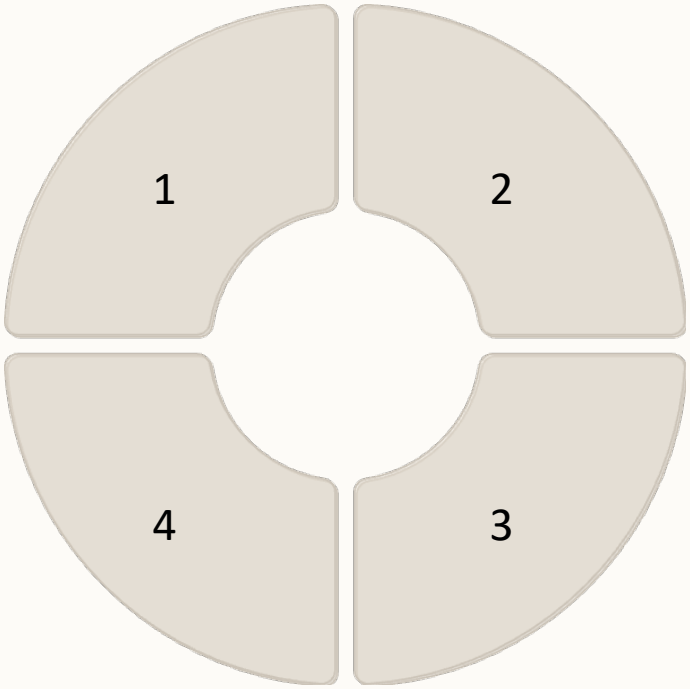
Understanding Your Metabolic Type- Oxidation Rate

Fast Oxidation

Characterized by overactive thyroid and adrenal glands, resulting in rapid metabolism but potential for quick burnout

Mixed Oxidation

One gland overactive while the other is underactive, creating energy fluctuations



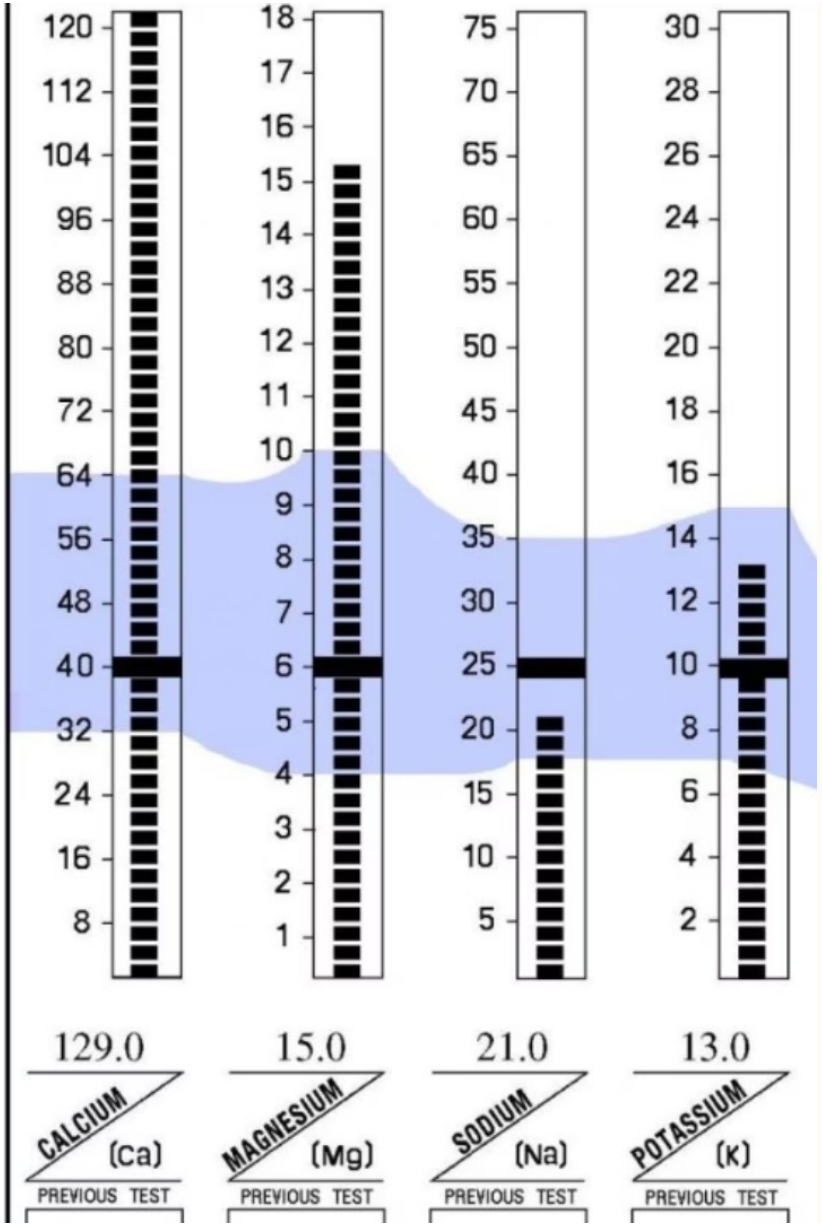
Balanced Oxidation

Optimal state where energy production is efficient and sustainable

Slow Oxidation

Characterized by underactive thyroid and adrenal glands, resulting in sluggish metabolism and chronic fatigue

Your oxidation type determines how efficiently your body produces energy. Understanding whether you're a fast, slow, or mixed oxidizer is essential for creating an effective nutritional balancing program tailored to your specific needs.



Oxidation Types: Slow Oxidizers

1. Adrenal Activity

   Lower adrenal and thyroid activity

2. Energy Production

   Burn food slower than normal

3. Calcium & Magnesium

   Higher tissue levels of these minerals

4. Sodium & Potassium

   Lower levels of these minerals

Slow oxidizers need more protein to stabilize their abnormal oxidation rate and blood sugar. They handle fats and oils poorly and do better with complex carbohydrates and vegetables.

Oxidation Types: Fast Oxidizers

1. Adrenal Activity

   Higher adrenal and thyroid activity

2. Energy Production

   Burn food faster than normal

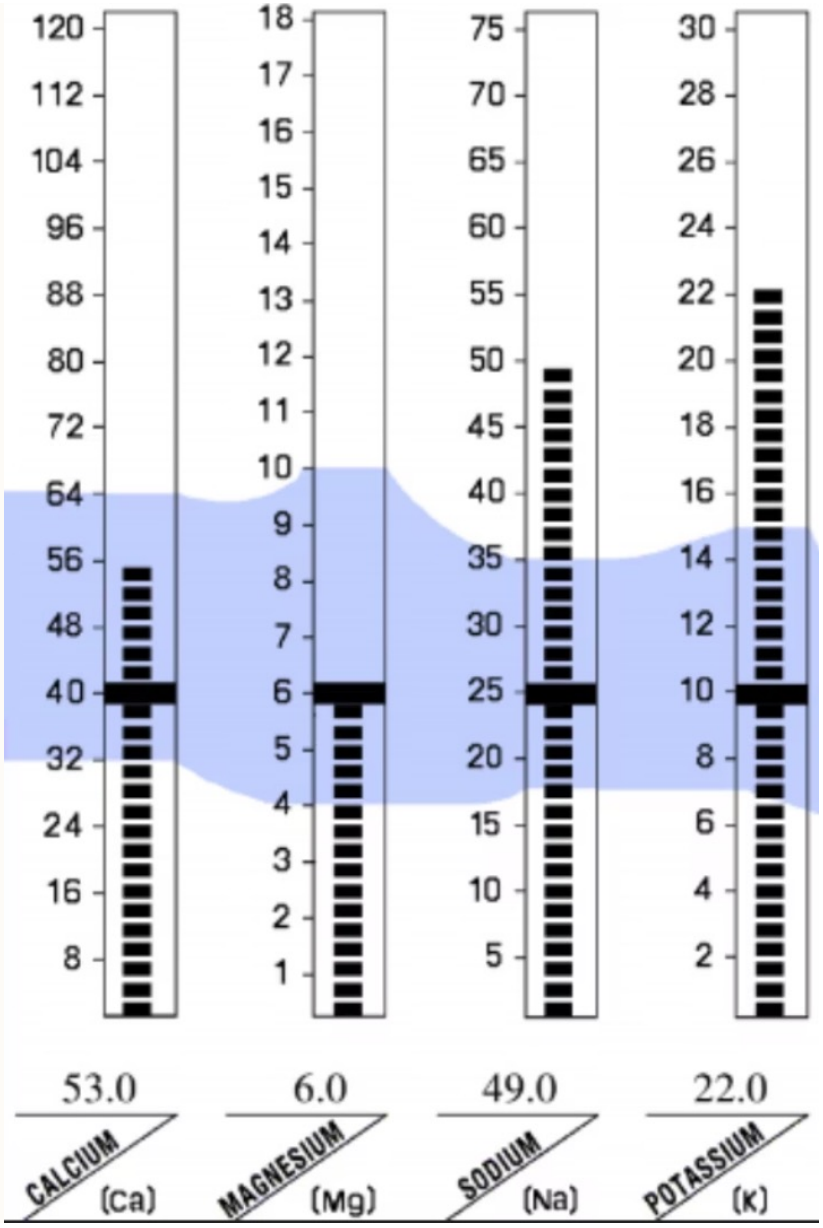
3. Calcium & Magnesium

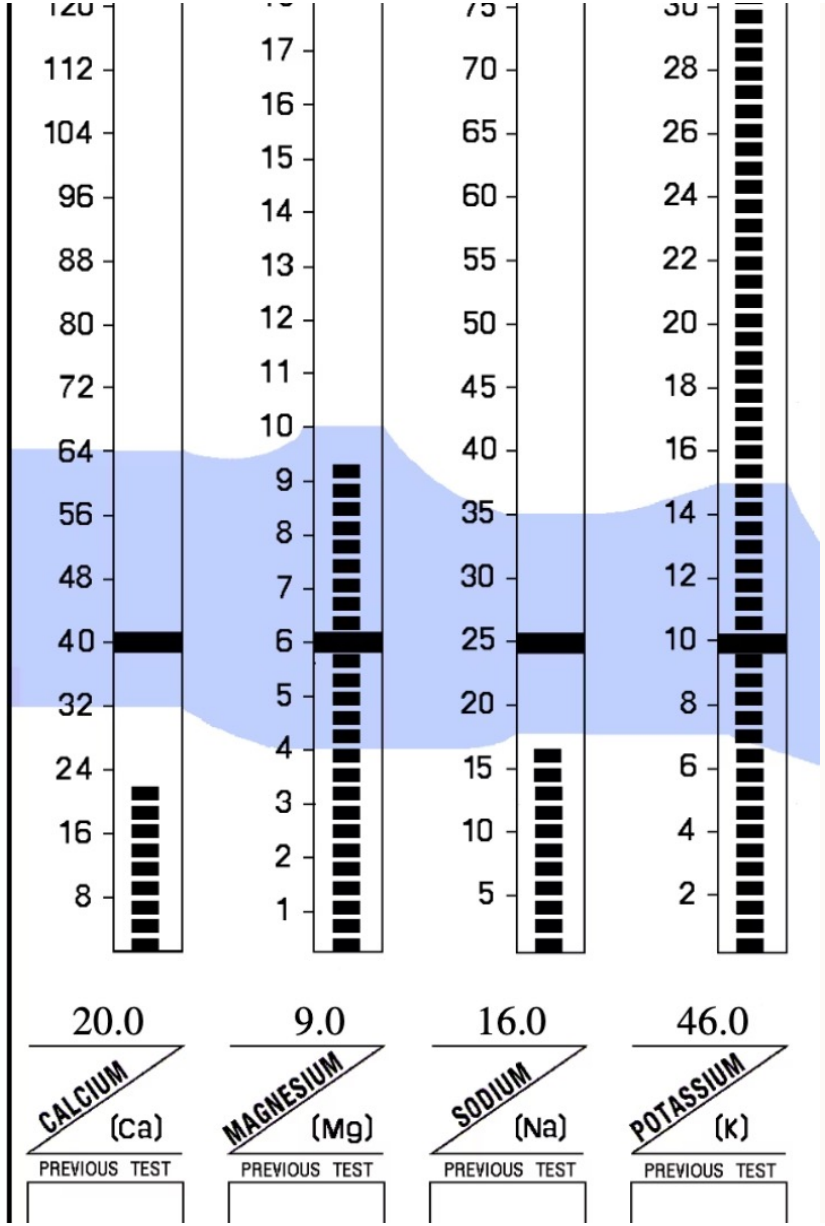
   Lower tissue levels of these minerals

4. Sodium & Potassium

   Higher levels of these minerals

Fast oxidizers need more fats and oils with each meal to slow their rapid metabolism. They should reduce sugars and starches which can increase their already rapid oxidation rate.





Oxidation Types: Mixed Oxidizer

Ca/K ratio is greater than 4 AND Na/Mg Ratio is greater than 4.17

Ca/K ratio less than 4 AND Na/Mg ratio less than 4.17

One of the two ratios used to assess oxidation rate indicates fast and the other indicates slow oxidation.

Mix of the two oxidation rates

This is generally a temporary state and not very important.

Balanced Oxidation Type The Goal

Optimal Rate

Neither too fast nor too slow

Efficient Energy

Maximum usable human energy production

Health Markers

Stable energy and good overall health

Introduction to the Minerals

Minerals are perhaps the most important groups of nutrients human beings require. Unlike some vitamins, minerals cannot be made inside the body and must come from the diet or drinking water. They regulate most body functions by participating in all chemical compounds in our bodies and form the structure of the body.

Macrominerals

Calcium, magnesium, sodium, potassium, phosphorus, and sulfur - their roles and relationships.

Zinc and Copper

The "twins" - critical trace minerals with opposing functions in the body.

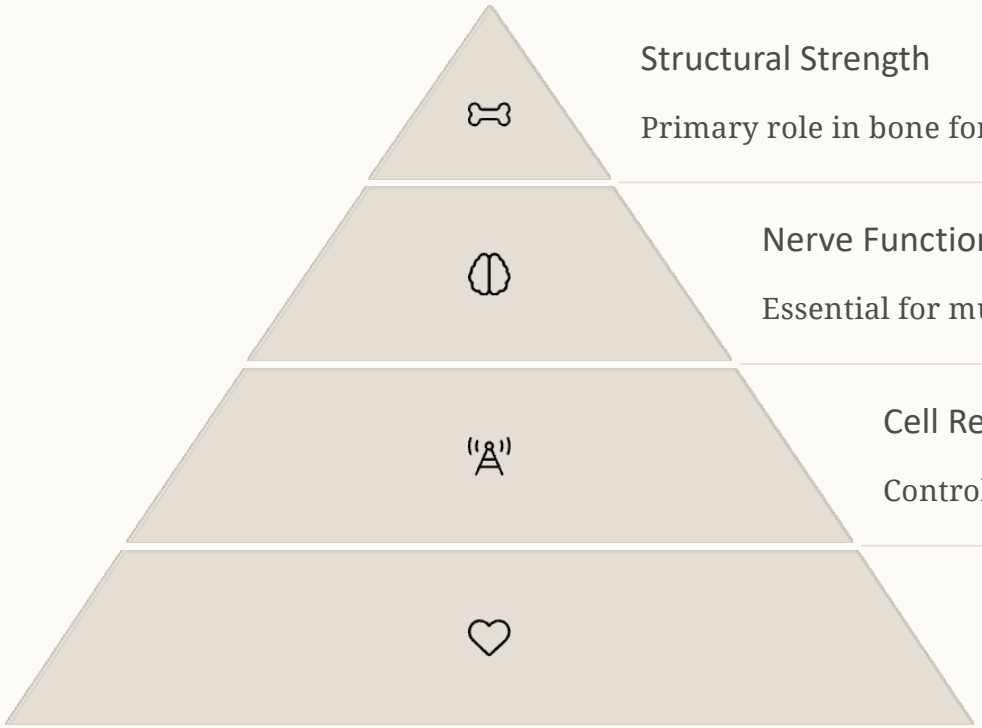
The Amigos

Iron, manganese, chromium, and selenium - their interactions and importance.

Toxic Metals

Lead, mercury, cadmium, aluminum, and others - their effects and removal.

Calcium: The Structural Element



Structural Strength

Primary role in bone formation

Nerve Function

Essential for muscle and nerve activity

Cell Regulation

Controls cell permeability and division

Vital Functions

Blood clotting, pH balance, detoxification

Calcium is called the structural element because almost all of it is in the bones and teeth. However, calcium is also vital in small quantities for nerve tissue and blood. It is one of the most plentiful elements on earth and in the body, critical for life as it is required for the formation of calcium carbonate and other essential mineral compounds.

Calcium Sources and Deficiency

Excellent Sources

- Raw and organic dairy products
- Carrots and carrot juice
- Nuts and seeds (especially almonds)
- Dark green vegetables
- Bone broths
- Sardines with bones

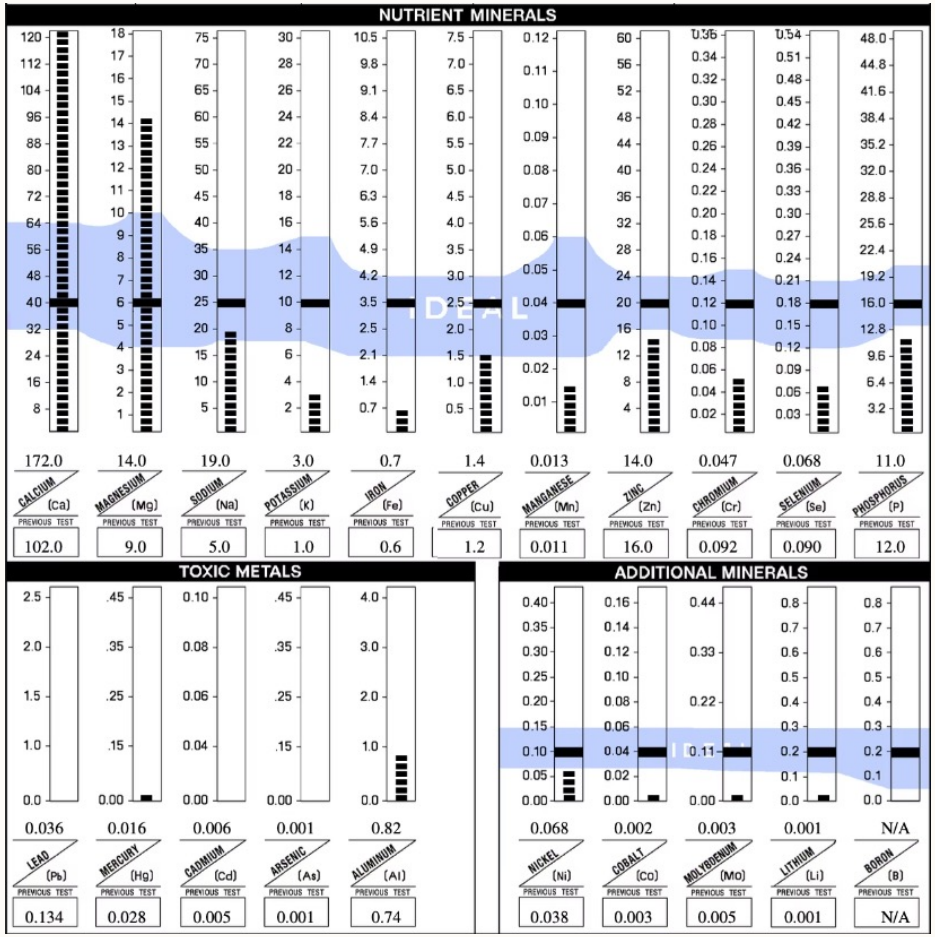
Deficiency Symptoms

- Osteoporosis and rickets
- Tooth decay and poor posture
- Irritability and insomnia
- Muscle cramps
- Hyperkinesis
- High blood pressure

Toxicity Symptoms

- Fatigue and depression
- Muscle weakness and pain
- Arteriosclerosis and arthritis
- Kidney stones
- Bone spurs and rigidity
- Constipation

Excellent quality bioavailable calcium is lacking in the diets of most people. When cows milk is pasteurized and homogenized, calcium availability declines greatly. Strict vegetarians can have even more difficulty obtaining enough calcium, although greens and carrot juice are excellent sources if consumed in sufficient quantities.



Calcium and lead dumping

DEXA scan went from osteoporosis to osteopenia!!!

On the program 2 years

Calcium in the Life Cycle

Infancy

Babies need calcium for developing bones and nervous systems. Breastfeeding for 2-3 years provides optimal calcium.

1

2

Childhood

Full-fat milk and calcium-rich foods support bone growth and development. Avoid fruit juices and soda that deplete calcium.

Adulthood

Calcium needs continue for bone maintenance and numerous body functions. Most adults benefit from supplementation.

3

4

Older Age

Calcium becomes increasingly important to prevent osteoporosis and maintain overall health as absorption efficiency decreases.

Children need a lot of good quality calcium for their bones and developing nervous systems. This is just one reason why a child's diet is so critical for physical and intellectual development. Ideally, children should be breastfed for at least two or three years to give them the best start in life.

Calcium Supplements and Synergists

Best Supplements

Food-based sources like carrot juice or kelp, calcium in various forms are most effective.

Key Synergists

Magnesium, phosphorus, silicon, vitamins A and D, and adequate stomach acid are essential for calcium utilization.

Avoid

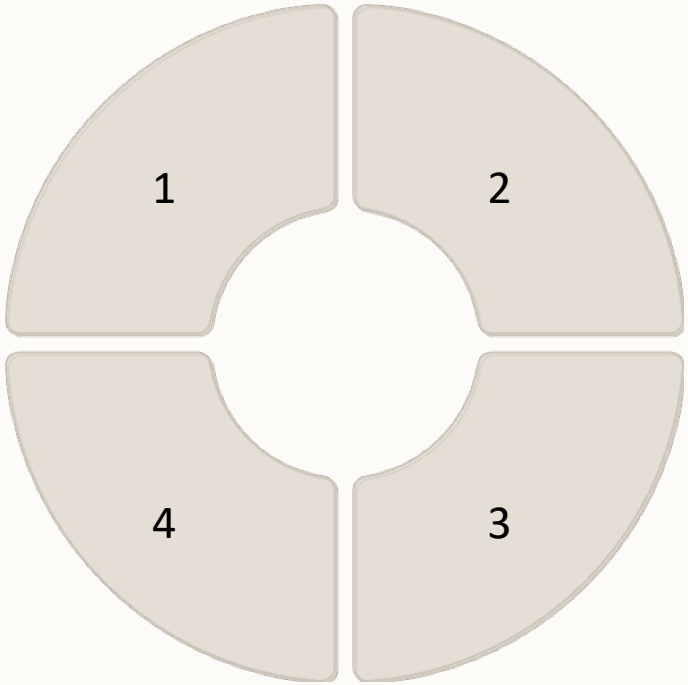
Coral calcium, and sugared supplements are poorly absorbed and may contain contaminants.

Most people need some calcium supplementation. Dr. Eck gave everyone a significant amount of supplemental calcium and magnesium because most people do not obtain enough bioavailable calcium in their diets, and calcium helps relax the sympathetic nervous system.

Magnesium: The Enzyme Mineral

Enzyme Activation

Required for thousands of critical enzymes throughout the body



Energy Production

Essential for ATP formation and cellular metabolism

Muscle Function

Crucial for muscle relaxation and preventing cramps

Nervous System

Calms the nervous system and reduces stress response

Magnesium is another structural element, but has mainly to do with enzyme structures, not physical ones. Magnesium is involved in every body function, where it is required for thousands of critical enzymes everywhere in the body. It is also one of very few minerals that cannot be replaced by a less preferred mineral in many of these enzyme systems.

Magnesium Deficiency and Sources

Deficiency Symptoms

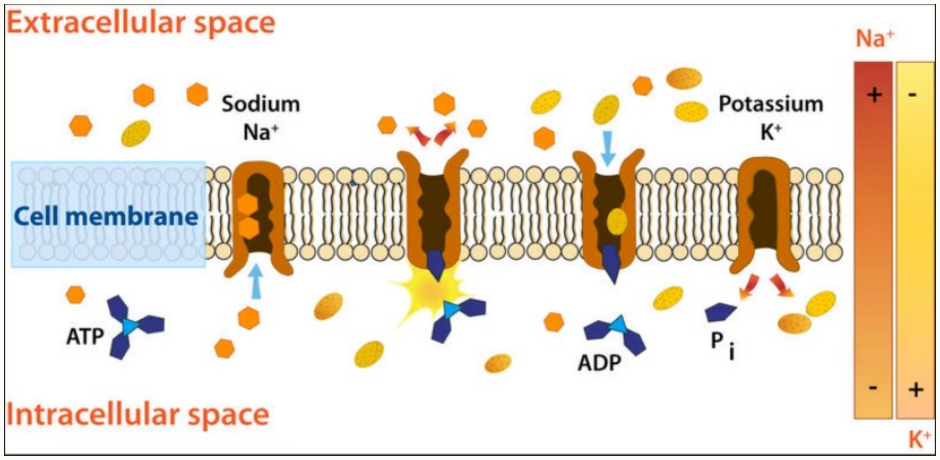
- Anger and irritability
- Fatigue and muscle pain
- Fibromyalgia
- Muscle spasms and cramps
- Migraines and headaches
- Anxiety and depression

Best Sources

- Dark leafy greens
- Nuts and seeds
- Whole grains
- Legumes
- Avocados
- Dark chocolate (in moderation)

Magnesium is low in almost everyone today due primarily to low dietary intake. Refined grains, fruits, soda pop, coffee, teas and cows milk dairy products contain very little magnesium. Stress and too much exercise also use up magnesium quickly. Very few sports drinks replenish it in great enough quantity.

Sodium: The Electrical Carrier- Ideal level 25



Sodium is the most important carrier of electrical activity in the human body. It operates the sodium-potassium pump that drives nutrients across cell membranes, making them more permeable. Without sufficient sodium, nutrients cannot adequately nourish cells, leading to energy depletion.

Many fear sodium because of its association with high blood pressure, but hypertension often results from insufficient "available" calcium rather than sodium excess. Declining tissue sodium levels are a prime indicator of aging, as they directly impact cellular energy production.

Sodium: The Solubility Mineral- Ideal 25

The Great Solvent

Sodium is a monovalent element that dissolves many compounds made of calcium, magnesium, copper, iron, zinc and other minerals.

The Great Alkalizer

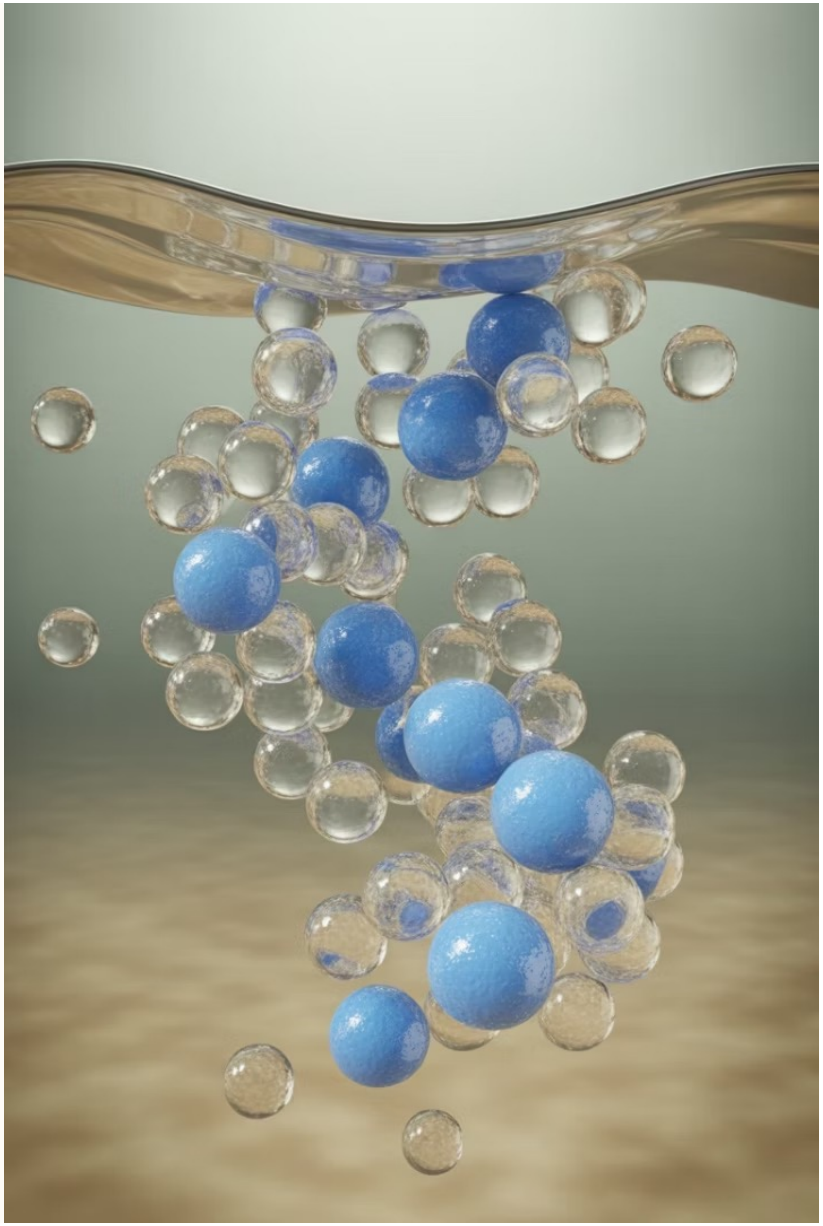
Sodium is a very alkaline-forming element used to help maintain an alkaline medium for nutrient exchange in the blood and interstitial fluid.

Adrenal Connection

Sodium is regulated primarily by the adrenal glands. High sodium is associated with excessive adrenal activity, while low sodium indicates adrenal weakness.

Electrical Conductor

Sodium is one of the finest conductors of electricity, representing one pole of the human "battery" with potassium as the other pole.



Sodium's Regulatory Functions

pH Regulation

Sodium helps maintain proper acid-alkaline balance in the body fluids, crucial for optimal enzyme function and overall health.

Fluid Balance

Controls blood and other fluid viscosity, helping maintain proper hydration and blood pressure throughout the body.

Membrane Potential

Regulates cell membrane permeability, sodium pump action, and neuromuscular irritability for proper nerve impulse conduction.

Glandular Activity

Directly and indirectly regulates thyroid, pituitary, pancreas and other glandular activities essential for metabolism.

Sodium is the great regulator in the body. Although sodium does not participate in a single enzyme, it is essential for regulating pH, blood viscosity, CO_2 transport, and the solubility of proteins and organic acids. It influences stomach acid levels, blood pressure, and even blood sugar through its effect on the adrenal glands.

Potassium: The Cellular Mineral- Ideal 10

Cellular Balance

Potassium is mainly inside the cells, while sodium concentrates more in the blood and interstitial fluid. This balance is crucial for cellular function.

Electrical Potential

With a single electrical charge, potassium is a good electrical conductor and maintains the electrical potential of the body's cells.

Hormone Connection

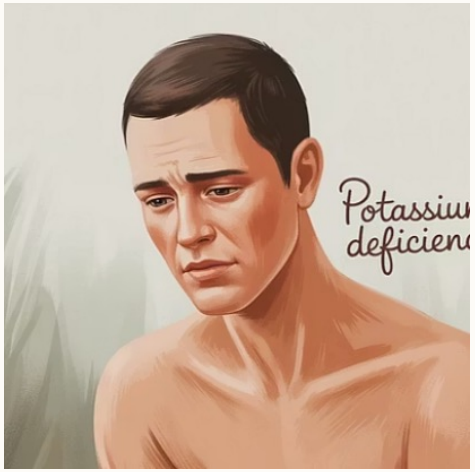
Associated with cortisol and cortisone levels, which are slower-acting stress hormones compared to sodium's connection with adrenalin.

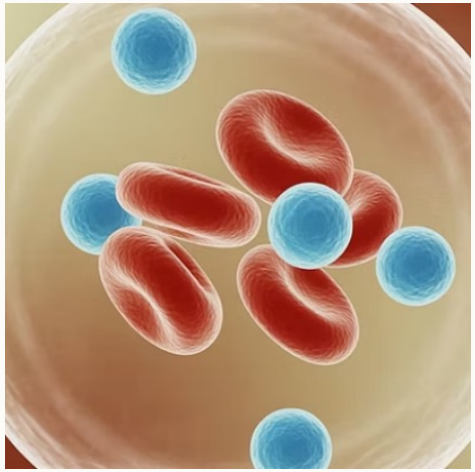
Cancer Fighter

Dr. Max Gerson pioneered a high potassium diet for cancer and other degenerative diseases, recognizing its importance in cellular health.

Potassium is the other major monovalent element in the body, along with sodium. It is tied so closely with sodium that they form a pair. Potassium performs many essential functions ranging from regulating the heart to balancing the electrical potential of the body.

Potassium Functions and Deficiency

Potassium is essential for nerve conduction, especially in the heart. Those who eat improperly with not enough vegetables may experience weakness, palpitations, skipped beats, arrhythmias and rarely heart attacks from potassium depletion. Potassium also regulates blood viscosity, serum and cellular acidity, and CO2 transport in red blood cells.

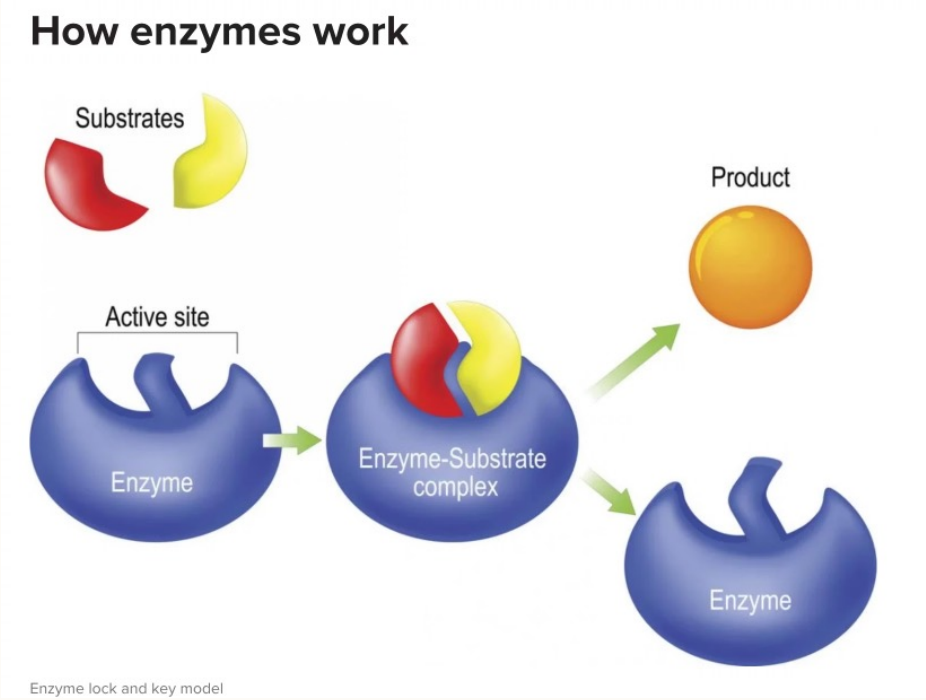
Additionally, potassium is crucial for regulation of cell membrane potential, cell permeability, sodium pump action, muscle contraction and relaxation, and nerve impulse conduction. These functions work in conjunction with sodium and other macrominerals.

The Trace Minerals: Introduction

20+	1000s	3
Essential Trace Elements	Enzyme Systems	Key Categories
Needed in very small quantities but critical for health	Trace minerals function as components or co-factors for thousands of enzymes	The microminerals- iodine, selenium, chromium, and fluoride, The twins (zinc/copper), the amigos (iron/manganese/chromium), and others

The trace minerals are a group of about 20 elements needed in human and animal bodies in very small quantities. They are often toxic in higher amounts. As a group, they function almost exclusively as components or co-factors for millions of enzymes, many of which have yet to be identified.

This differs from the macrominerals, which are needed more for pH, fluid and osmotic regulation. Understanding trace minerals is essential for addressing many modern health conditions.



Enzyme lock and key model

Enzymes examples:

- Food particle
- Unwinding DNA
- Producing hormones
- Liver enzymes

Phosphorus: The Power Mineral

Optimal Range

A good phosphorus range is between 15-18 mg%

Low Phosphorus Concerns

Below 12 mg% indicates low vitality and insufficient protein synthesis

High Phosphorus

Usually indicates mild tissue catabolism that corrects with nutritional balancing

Low phosphorus is a serious concern as it indicates insufficient protein synthesis, causing excessive tissue breakdown or protein catabolism. This slows or stops healing and regeneration of the body. Causes include poor diet, hurried lifestyle affecting digestion, digestive tract problems, zinc deficiency, and copper toxicity.

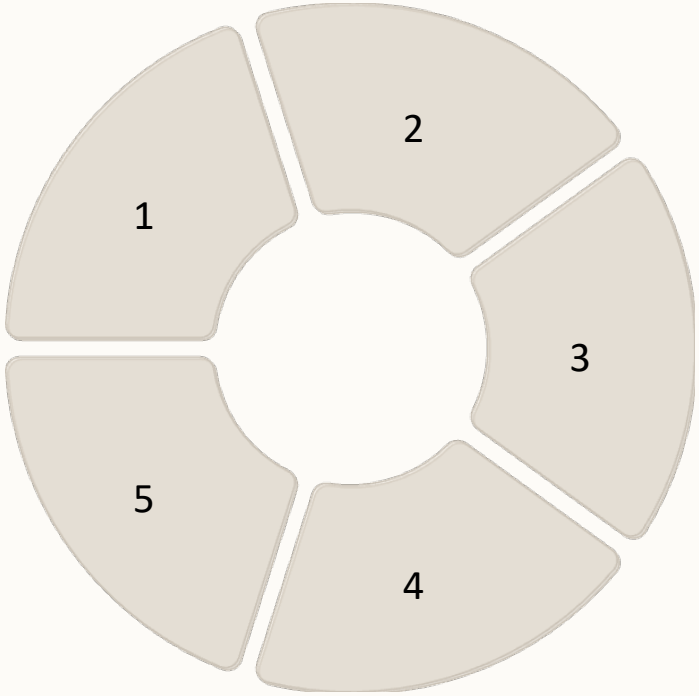
On retests, phosphorus can rise above normal if the body is breaking down diseased tissue rapidly. Initial readings can be displaced upward by toxic metals like lead, which may cause the level to decline on early retests as these metals are eliminated.

Interpreting Iron, Copper, Manganese, Chromium and Selenium

Iron

Ideal level: 1.8-2 mg%

Low levels not significant



Manganese

Ideal range: 0.03-0.04 mg%

Most are deficient in bioavailable form

Selenium

Good range: 0.09-0.12 mg%

Almost everyone needs supplementation

Copper

Good range: 1.5-2.5 mg%

Hair levels often unreliable

Chromium

Good range: 0.12-0.16 mg%

Everyone needs supplementation

These trace minerals play crucial roles in body function, but their hair levels can be misleading. Understanding the patterns and relationships between these minerals is more important than their absolute values. Each mineral has specific interpretation guidelines that help practitioners design effective nutritional balancing programs.

Interpreting Zinc: The Balancing Mineral

Optimal Range

A good zinc range of 14-19 mg% indicates better mental balance. Fast oxidizers may have slightly lower zinc than slow oxidizers. A fast oxidizer with zinc greater than 15 mg% is likely a temporary fast oxidizer.

High Zinc Levels

High zinc often means it's trying to balance or protect against a toxic metal, usually copper. It rarely indicates excessive zinc in the body. Zinc levels may vary during a nutritional program as it compensates for sodium levels.

Low Zinc Levels

Low zinc often indicates mental and emotional instability, reduced protein synthesis, copper toxicity, developmental problems in children, and possibly impaired immune response.

On retests, zinc may decline if it's acting as a defender or because it's being retained in the body replacing toxic metals in enzyme binding sites. Dr. Eck found that everyone needs zinc supplementation today, with the exact amount determined by the sodium/potassium ratio.

Zinc: Functions and Deficiency

1000s	100%	20+
Enzyme Systems	Deficiency Rate	Health Conditions
Required for thousands of enzymes throughout the body	Virtually everyone today has some degree of zinc deficiency	Zinc deficiency contributes to numerous physical and mental health issues

Zinc has many critical roles in the body, including protein synthesis, carbohydrate metabolism, sexual and reproductive activity, vision, cardiovascular health, acid-base balance, digestive enzyme production, and nervous system function. It is also essential for appetite regulation, hormone synthesis, immune response, and detoxification.

Perhaps most remarkably, zinc is critical for higher level mental functioning. It helps activate the higher nerve centers of the neocortex, enabling advanced mental activity and more evolved attitudes such as compassion and love. When zinc becomes deficient, all types of criminal and anti-social behaviors increase drastically.

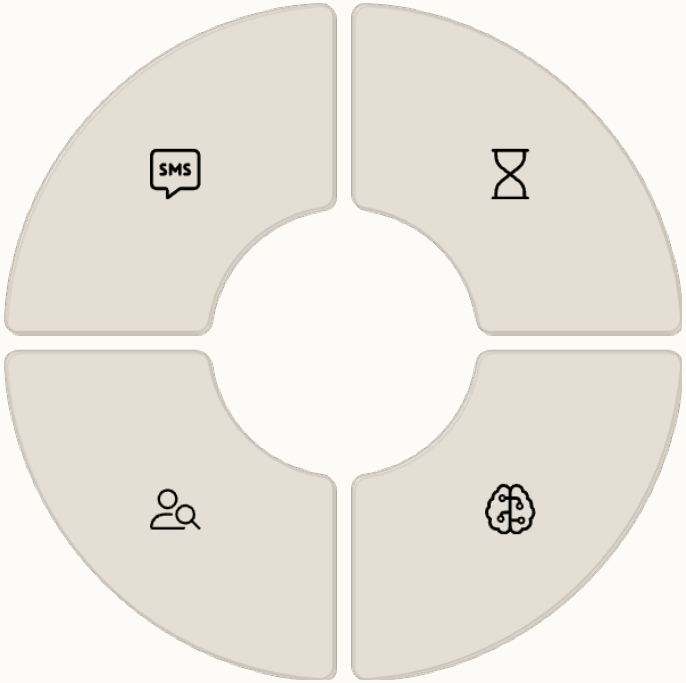
Zinc and Digestive Health

Enzyme Production

Zinc is needed for digestive enzyme production in the liver, pancreas and elsewhere.

Insulin Function

Insulin production, secretion and effectiveness depend upon zinc.



Tissue Growth

Fast-growing intestinal tissues depend on zinc for protein synthesis enzymes.

Nervous System

The autonomic nervous system requires zinc for ideal digestive activity.

Copper: The Emotional Mineral

General Principles

A good range for copper is about 1.5 to 2.5 mg%. Copper doesn't accumulate much in hair tissue, and hair copper levels mean very little in this interpretation. Hair copper levels are unreliable as they're often influenced by many factors.

All slow oxidizers tend to have excess copper, regardless of the hair reading. Some show more copper on the test than others. All fast oxidizers need some copper regardless of the hair reading.

Significant Levels

Very low copper (less than 1.0 mg%) indicates a more severe copper imbalance. Very high copper (greater than 2.5 mg%) indicates an imbalance, though an imbalance is possible even when the hair copper level is in the normal range.

High copper in fast oxidizers usually means hidden copper toxicity with biounavailability and that the person is a temporary fast oxidizer or slow oxidizer under stress. Dr. Eck noted these individuals are often somewhat compulsive and make excellent detail-oriented workers.

The hair copper level often increases as copper is eliminated from the body during a nutritional balancing program. Most fast oxidizers (except young children) and almost all slow oxidizers have some biounavailable copper, which eventually starts coming out of the body as they progress on a program, improving symptoms like headaches, acne, anxiety, and depression.

Zinc and Copper: The Twins

Zinc: The Gentle Strength Mineral

Zinc is a very alkaline-forming, rather soft, white-colored metal. Dr. Eck called it the "gentle strength mineral" and it can also be called the "balancing mineral" because of its unique actions in the body.

- Essential for protein synthesis
- Required for immune function
- Critical for male reproductive health
- Acts as a calming neurotransmitter

Copper: The Emotional Mineral

Copper is a soft, reddish, malleable metal that is an excellent conductor of electricity. Dr. Eck called copper the "emotional" or "love mineral" because of its profound impact on the central nervous system.

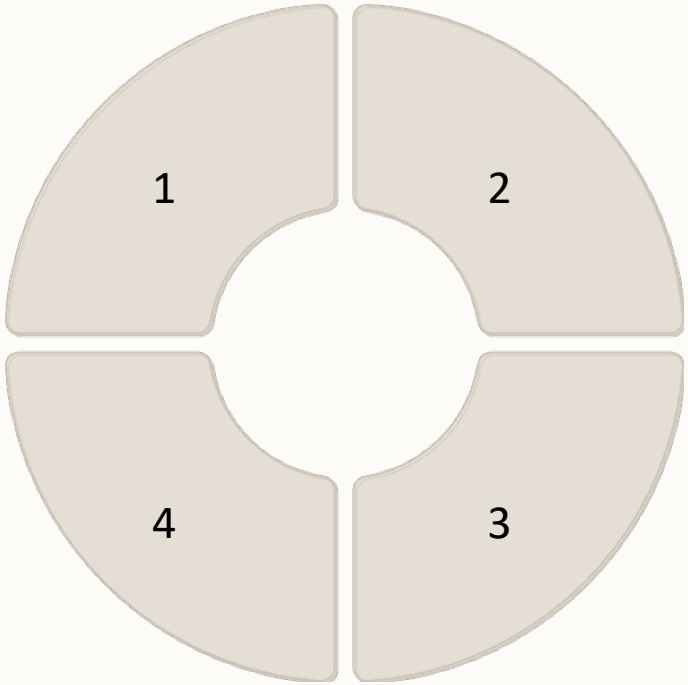
- Required for connective tissue
- Needed for energy production
- Essential for female reproductive health
- Stimulates neurotransmitter production

Zinc and copper are called the twins because they have a very close and interesting relationship to each other in the body. They are both involved in the stress response, sexual and reproductive activity, emotions and brain activity, and maintenance of connective tissue and immune response.

Zinc and Copper Imbalance

Depleted Soils

Low zinc in soil and hybrid crops leads to deficiency in food supply



Chronic Stress

Depletes zinc and causes copper accumulation through adrenal exhaustion

Diet Factors

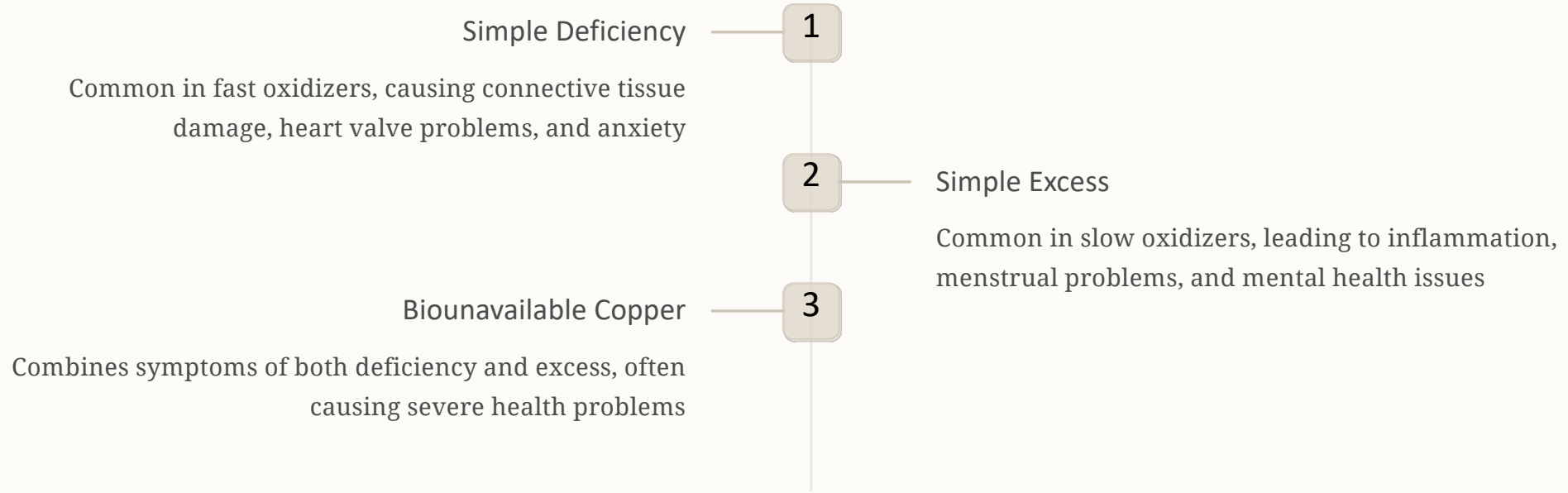
Food refining, vegetarian diets, and high-copper foods contribute to imbalance

Medical Causes

Birth control devices, hormone therapy, and some medications affect copper levels

Dr. Eck observed that everyone today has zinc and copper imbalance to some degree. Most parents-to-be are deficient in zinc and have excess copper, which is passed on to their children in utero. This imbalance is congenital (present at birth) but not genetic or inherited - a crucial distinction.

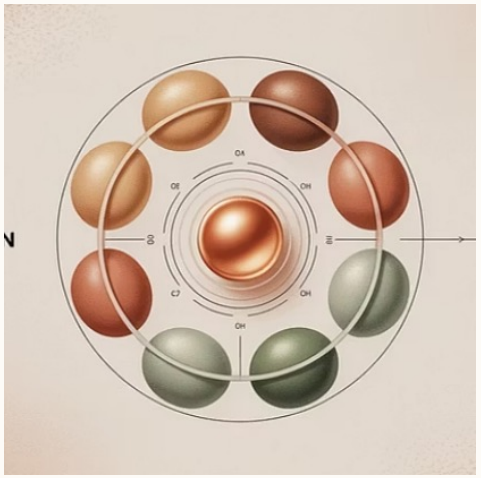
Copper Imbalance Types and Symptoms

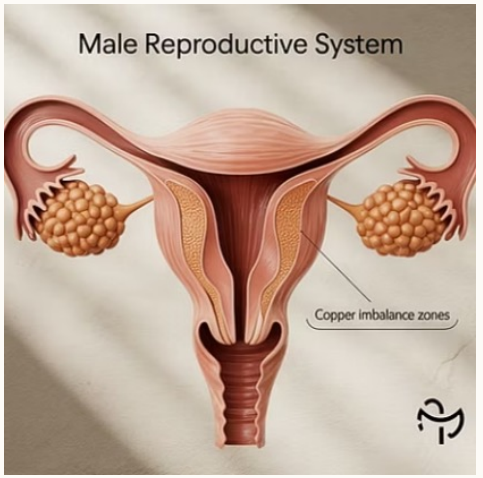


Copper imbalance can manifest in several ways, each with distinct symptoms. Nervous system symptoms are particularly significant, as copper has a profound impact on the central nervous system. Most psychological and psychiatric conditions improve when copper is brought into better balance in the body.

Copper stimulates the diencephalon (the "old" or "animal brain"), enhancing emotional conditions from depression and anxieties to autism, ADD, ADHD, brain fog, insomnia, and many other mental health issues.

Copper and Reproductive Health



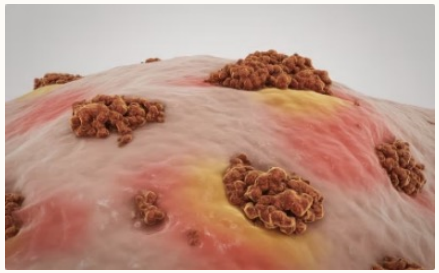


Women are copper dominant, while men are zinc dominant. This means copper is more important for women, while zinc is somewhat more important for men. Adult women suffer much more from copper imbalance than men.

Premenstrual syndrome often mimics the symptoms of copper imbalance because estrogen levels and copper levels correlate well, and both increase before the menstrual period. Other copper-related female symptoms include amenorrhea, dysmenorrhea, fibroid tumors, ovarian cysts, and endometriosis.

In men, symptoms of copper toxicity include prostate enlargement, prostate infections, erectile dysfunction, and testicular pain. Secondary sex characteristics and sexual orientation may also be influenced by copper levels.

The Amigos: Iron, Manganese, Chromium and Selenium



Iron: The Hardness Mineral

Like the metal itself, iron tends to be associated with hardness and strength, but a rigid and brittle strength. Most people have excessive amounts of biounavailable iron, contributing to inflammation and numerous health problems.

Manganese: The Brain Mineral

Essential for the nervous system and brain function, manganese often accumulates with iron and aluminum in a biounavailable form, causing various health issues.

Chromium and Selenium

These critical trace elements are often deficient in bioavailable form while excessive in biounavailable form. They work together with iron and manganese in many enzyme systems.

These minerals are called "The Amigos" or "Friends" because they usually appear together in a biounavailable form, particularly in slow oxidizers. The principle is that if any one is present in excess on a hair analysis, most likely all of them are present in excess in the body in a biounavailable form, contributing to inflammation and numerous health conditions.

Iron: The Strength Mineral

Ideal Level

About 1.8-2 mg% in hair

Significance

Low iron not significant; high indicates excess and biounavailability

Toxicity

Widespread, especially among slow oxidizers regardless of hair level

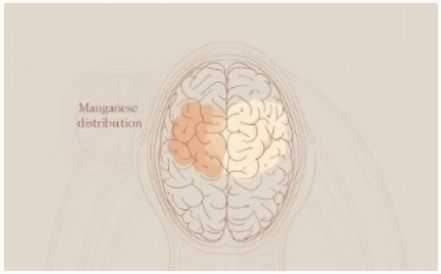
Supplementation

Rarely needed except in specific cases

Iron does not normally build up in the hair, so a low hair level is not a reliable way to measure the body's iron status. High hair iron indicates some degree of biounavailable iron. Most slow oxidizers in particular have some biounavailable iron, which seems to be part of aging.

A high iron level almost always indicates an active elimination of biounavailable iron through the hair and skin, not necessarily more severe iron toxicity. Hidden iron toxicity is indicated by an aluminum level above about 0.1 mg%, or a manganese level above about 0.04 mg%.

Manganese: The Brain Mineral



Ideal Range

An ideal range for manganese is about 0.03 to 0.04 mg%. Most people in the Western world are deficient in bioavailable manganese, regardless of the hair reading. Most people have some biounavailable manganese, especially slow oxidizers.

Interpretation

High hair manganese on a first test indicates manganese toxicity and biounavailability. In some cases, it indicates manganese just in or on the hair due to contaminated water. Low manganese is not significant since everyone needs more manganese.

Supplementation

Dr. Eck supplemented most everyone with manganese, especially slow oxidizers and those with a low sodium/potassium ratio. During a nutritional balancing program, manganese may rise on a retest as it is eliminated.

Hidden manganese toxicity indicators include an iron level greater than about 2 mg% or an aluminum greater than 0.1 mg%. This rough guide can be quite helpful in identifying biounavailable manganese that isn't showing directly on the hair test.

Selenium: The Protective Mineral

.09-.12	100%	1st
Ideal Range	Deficiency Rate	Priority
Good range for hair selenium in mg%	Almost everyone needs selenium supplementation	Food-based selenium supplements are often best

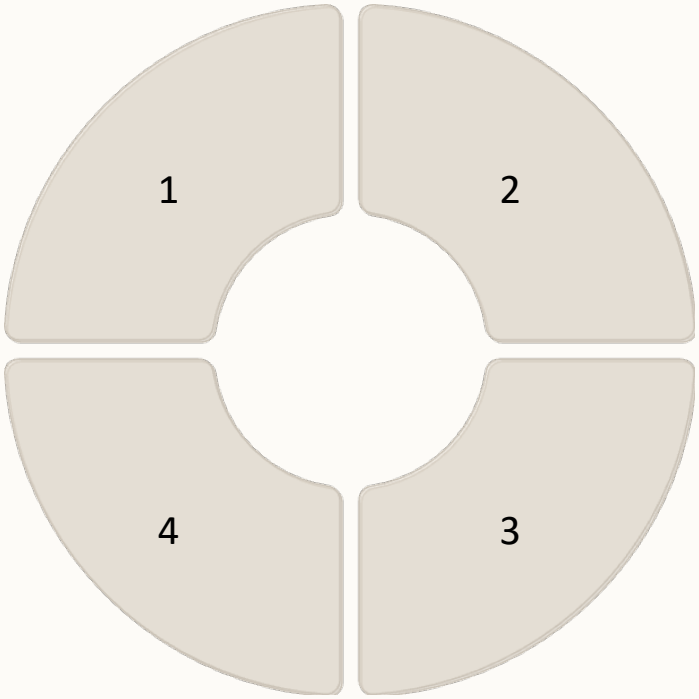
Hair selenium readings may not be highly significant for interpretation. Low selenium indicates a more severe deficiency in most cases. High selenium on a first test usually indicates the use of Selsun Blue shampoo, which contains selenium and can contaminate the sample.

During a nutritional balancing program, a high level almost always indicates a release of a biounavailable form of selenium through the hair and skin, as part of a healing process. This is not a concern, and the level typically returns to the standard range on the next hair analysis.

Chromium: The Glucose Mineral

Ideal Range

0.12-0.16 mg% in hair



Deficiency

Everyone needs supplementation

Absorption

Well-absorbed in many forms

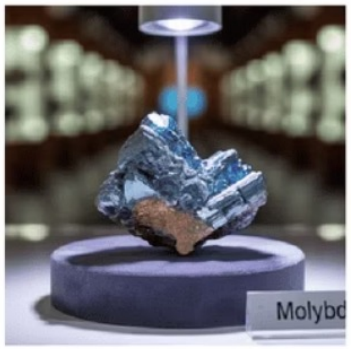
Low Levels

Indicates more severe deficiency

Hair chromium readings may not be highly significant for interpretation. Low chromium indicates a more severe deficiency in most cases. High chromium on a first test is rare but could be due to toxicity or flaking of chromium from older chromium-plated scissors used to cut the hair sample.

During a nutritional balancing program, a high level almost always indicates a release of a biounavailable form of chromium through the hair and skin. Chromium is well-absorbed in many supplemental forms and is essential for proper glucose metabolism.

Other Trace Minerals




The hair levels of other trace elements such as cobalt, molybdenum, lithium, silicon, boron, and others are somewhat unreliable in hair analysis interpretation. A high level of lithium will occur with medical lithium therapy. High levels of cobalt, boron, or other minerals occasionally occur, and the source is often difficult to trace.

In some cases, elevated levels are due to drinking and/or bathing in contaminated well water. By staying with a nutritional balancing program, these levels tend to even out on their own. Future research may reveal additional meanings for these readings as our understanding of trace mineral metabolism continues to evolve.

Toxic Metal Interpretation

Universal Presence

Everyone today has toxic metals, even if levels appear low in tests. Most are hidden deep in body organs and tissues. They come out in fits and spurts during a nutritional balancing program.

Hair Readings

A low hair toxic metal reading only means that, at the time the hair grew, the amount deposited was low. A high reading indicates the metal is being eliminated through hair/skin.

Individual Tolerance

Some people tolerate toxic metals better than others. In one person, minor levels can cause severe symptoms, while in another, high levels of multiple metals may not cause intense symptoms.

Nutritional balancing programs will remove up to two dozen toxic metals eventually. Toxic metals can displace trace elements and affect sodium and potassium levels. On retests, toxic metals often rise as they are eliminated - even a small increase may be significant. Special modifications like drinking distilled water, more rest, saunas, and coffee enemas can help remove them faster.

Specific Toxic Metal Indicators

Aluminum

An aluminum level of 0.1 mg% or greater may indicate hidden biounavailable iron and manganese (the 'three amigos'). These powerfully raise sodium levels and to a lesser degree, potassium levels.

Mercury

A mercury level greater than about 0.01 mg% is a hidden copper indicator. High mercury, along with lead, cadmium, and nickel, indicates significant kidney stress.

Cadmium

A high cadmium level, and in fact all high toxic metal levels, can indicate a trend for malignancy, cardiovascular disease, and other degenerative conditions.

Counterintuitively, while elevated toxic metals are not helpful for health, higher levels in the hair can sometimes be a good sign if it indicates more vitality and better ability to remove toxic metals. Fast oxidizers usually have higher levels of toxic metals than slow oxidizers because they have more energy to eliminate them.

Babies, infants, and children often show higher toxic metal levels than adults due to their higher vitality level and fast oxidizer status, not because they're more toxic. Environmental exposures can also cause high readings, either from internal contamination or external deposits on hair and skin.

Acceptable Toxic Metal Levels

Metal	Value in mg%	Value in ppm
Lead	0.05 mg%	0.5 ppm
Mercury	0.01 mg%	0.1 ppm
Cadmium	0.005 mg%	0.05 ppm
Arsenic	0.005 mg%	0.05 ppm
Nickel	0.06 mg%	0.6 ppm
Aluminum	0.1 mg%	1.0 ppm

Each laboratory issues its own acceptable toxic metal levels. As we learn more about how to reduce them further, these normal ranges should decrease. The values shown here represent the ideal or acceptable levels of major toxic metals currently relied upon in nutritional balancing science.

These values serve as important benchmarks when interpreting hair analysis results and designing detoxification protocols. Levels above these thresholds may indicate the need for specific interventions to support elimination pathways.

Key Mineral Ratios

MINERAL RATIO	IDEAL RATIO
CA/MG	6.67
CA/K	4.00
NA/MG	4.17
NA/K	2.50
ZN/CU	8.00
CA/P	2.50

Calcium/Magnesium	Blood sugar/lifestyle Ratio
Sodium/Potassium	Vitality Ratio
Sodium/Magnesium	Adrenal Ratio
Calcium/Potassium	Thyroid Ratio

The Sodium/Potassium Ratio: The Vitality Ratio

2.5

Ideal Ratio

The optimal range for balanced vitality and health

2-5

Good Range

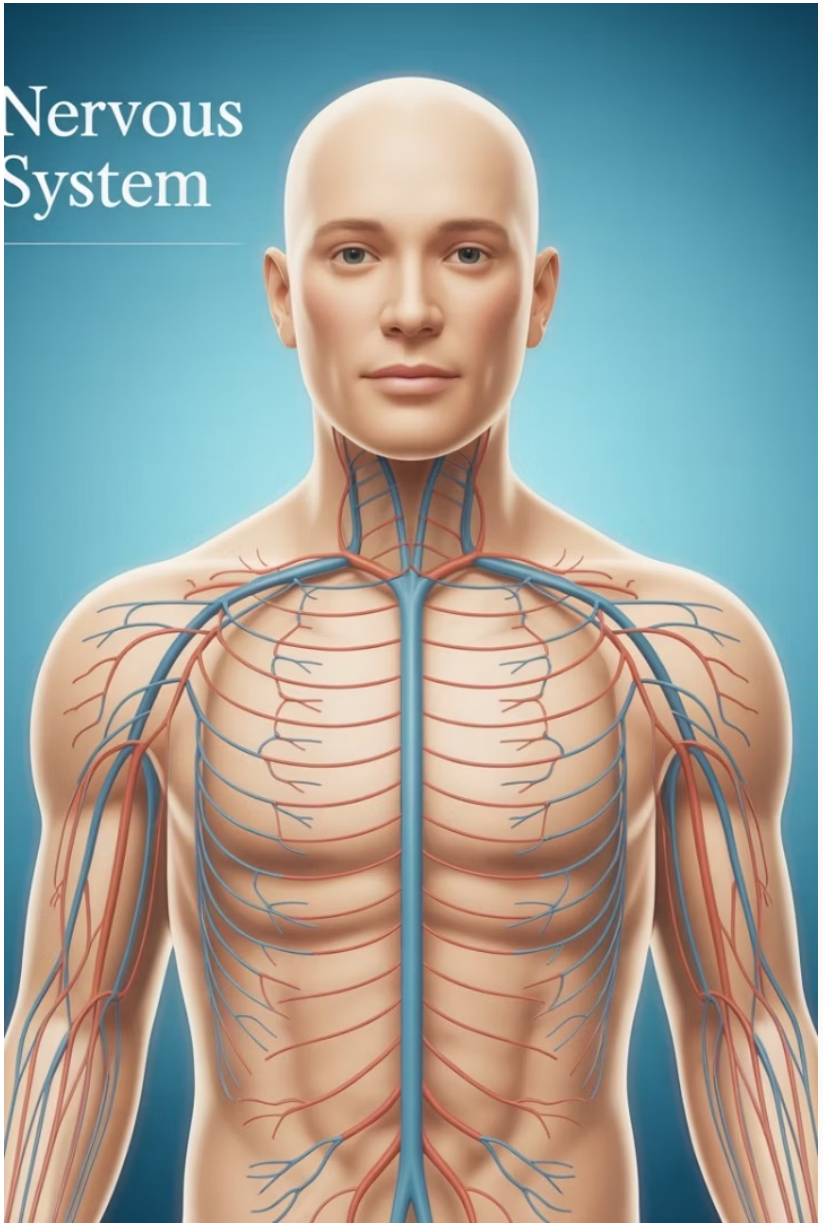
Acceptable range indicating proper metabolic function

<2

Low Vitality

Indicates reduced energy and potential health concerns

The sodium/potassium ratio is a fundamental indicator of your body's vitality. Dr. Eck called it the "vitality ratio" because it reflects your overall energy level and metabolic health. This ratio is calculated at the bottom of an ARL hair chart and provides critical insights into how your body is responding to various stressors.



Vitality Ratio: Key Indicators

Vitality Indicator

A ratio less than 2 indicates lowered vitality, with lower ratios showing greater depletion. A ratio above 15 may also indicate reduced vitality, though not as severely as a low ratio.

Sympathetic/Parasympathetic Balance

A higher ratio indicates a more sympathetic state (fight-or-flight), while a low ratio suggests a more parasympathetic or burnout state.

Inflammatory States

A high ratio tends toward more pain and inflammation, while a low ratio indicates less ability to mount an inflammatory response.

Charging State

A ratio between 2.5 and 6 indicates a "charging state" with electrically charged cells. Low ratios indicate "discharging" electrically.

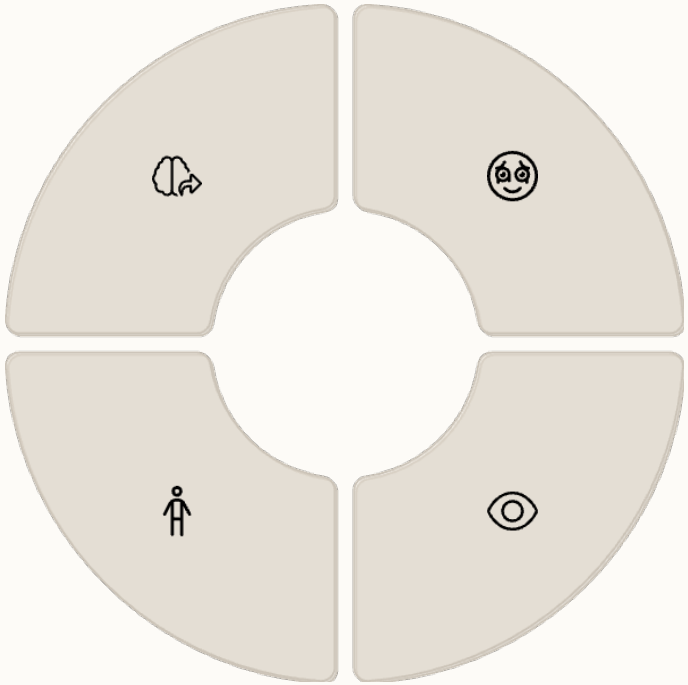
Vitality Ratio: Personality and Awareness

Copper Personality Types

High ratio: more angry, aggressive personality style

Social Orientation

High ratio: extroversion; Low ratio: introversion



Low Ratio Emotions

Frustration, resentment, hostility, lower energy, depression

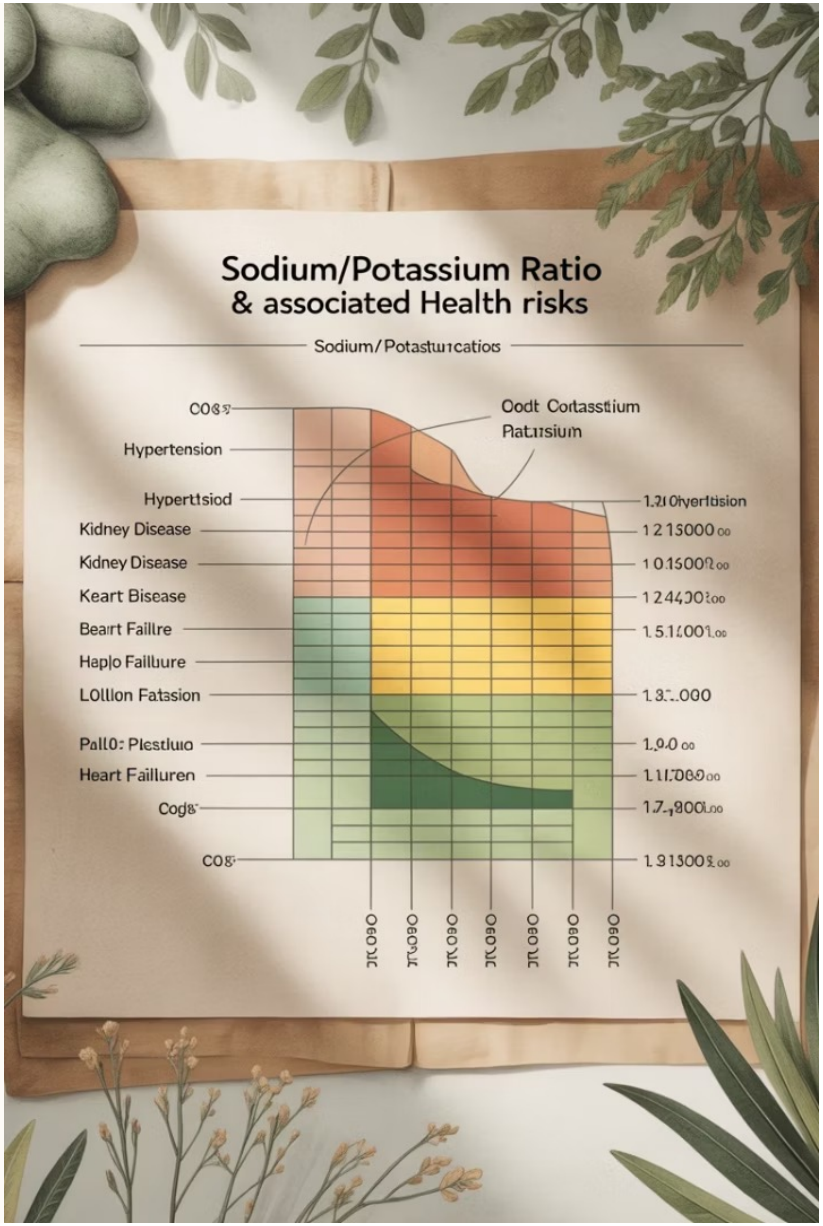
Awareness Indicator

Low ratio (especially <1): reduced awareness of hidden traumas or beliefs

The sodium/potassium ratio provides fascinating insights into personality traits and psychological states. It can indicate whether a person tends toward extroversion or introversion and can even suggest levels of self-awareness. This makes it valuable not just for physical health assessment but also for understanding psychological patterns.

Sodium/Potassium Ratio Interpretation Chart

RATIO	INTERPRETATION
Less than 1	Extreme exhaustion, chronic infections, hypoglycemia or diabetes, heart attack, cancer, stroke, excessive protein breakdown, catabolic state, resentment, frustration, hostility, hidden emotional traumas, lowered level of awareness.
1-2	Trend for diabetes, hypoglycemia, adrenal weakness and fatigue, allergies, reduced immune response, digestive weakness, low digestive enzymes, kidney and liver stress.
2-2.5	Mild low ratio - tendency for adrenal fatigue, some glucose intolerance, mild kidney and liver, cardiovascular stress.
2.5-6	Excellent range.
6-10	Mild elevated ratio - a trend for inflammation, acute stress or anger.
Greater than 10	High ratio - tendency for severe inflammation, pain, liver and kidney stress, anger and possibly "autoimmune" conditions.



The Calcium/Magnesium Ratio: Blood Sugar or Lifestyle Ratio

Ideal Ratio: 6.77	Good Range: 4-9.5	Common Imbalance
Optimal metabolic balance	Healthy metabolic function	Affects all age groups

The calcium/magnesium ratio, also known as the blood sugar or lifestyle ratio, provides insights into carbohydrate metabolism and lifestyle factors affecting health. This ratio is calculated at the bottom of the page on hair tests performed by Analytical Research Labs. Dr. Eck used a slightly wider range than the 4-9.5 now considered optimal.

This imbalance is commonly seen in both children and adults of all genders, making it an important marker to monitor across diverse populations.

Calcium/Magnesium Ratio: Causes and Significance

Dietary Causes

On first hair tests, imbalance often stems from excessive carbohydrates in the diet

Lifestyle Factors

Ratio over 13.5 indicates unhelpful lifestyle factors or attitudes

Physiological Impact

Associated with insulin regulation according to Dr. Eck's research

Spiritual Defensiveness

Ratio above 13.5 may indicate defending an unhelpful lifestyle or attitude

The calcium/magnesium ratio provides valuable insights into how dietary choices and lifestyle factors affect metabolic health. When this ratio is significantly elevated (above 13.5), it often points to deeper issues beyond simple nutritional imbalances, suggesting resistance to necessary life changes.

Calcium/Magnesium Ratio: Additional Insights

Retest Significance

During nutritional balancing programs, the body often eliminates biounavailable calcium, which can elevate the calcium level and calcium/magnesium ratio on hair mineral retests. This elevation is part of the healing process and not a cause for concern.

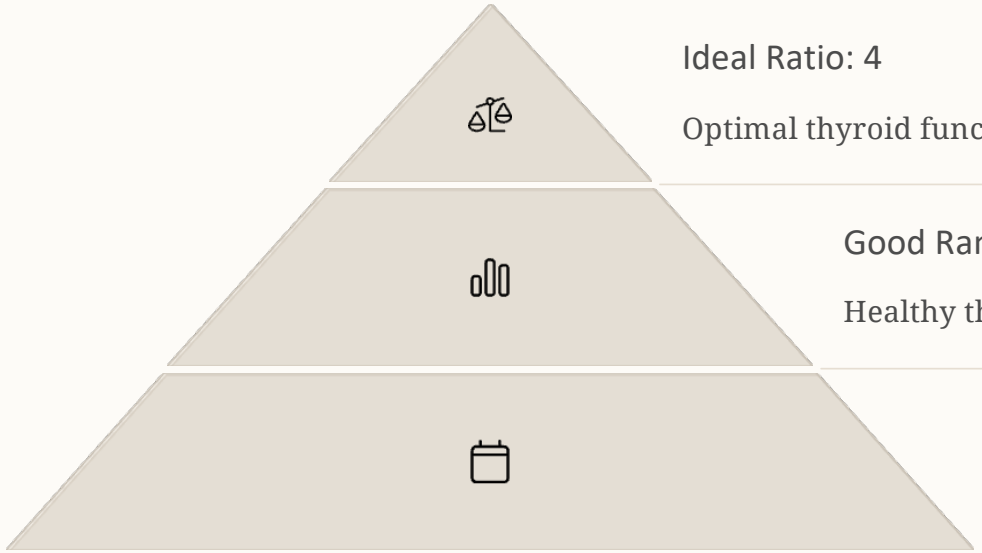
Energy Patterns

A low Ca/Mg ratio may represent a "charging" pattern (similar to a high Na/K ratio), indicating increased cellular energy. However, a ratio greater than about 25 may indicate a "discharging" pattern, suggesting energy depletion.

Mineral Loss Indicator

A ratio below 2 or above about 60 may reflect deeper health imbalances such as magnesium or calcium loss through the hair. These extreme values are often associated with high mercury levels in the body.

The Calcium/Potassium Ratio: The Thyroid Ratio



Ideal Ratio: 4

Optimal thyroid function at cellular level

Good Range: 2-6

Healthy thyroid activity range

Age Patterns

Toddlers: often low ratio; Adults: usually high ratio

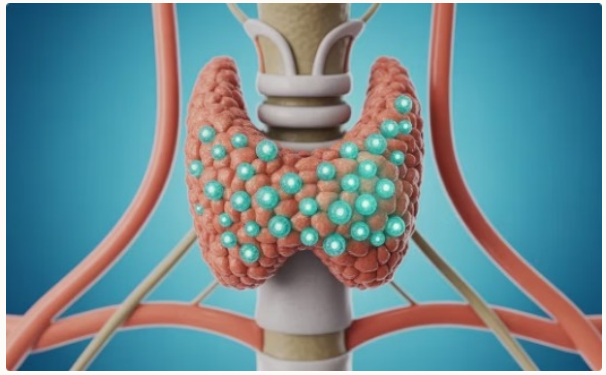
The calcium/potassium ratio, known as the thyroid ratio, provides insights into thyroid function at the cellular level. According to Dr. Eck's research, an ideal ratio is about 4, with a healthy range between approximately 2 and 6.

Interestingly, this ratio shows distinct patterns across age groups. Toddlers frequently exhibit a low calcium/potassium ratio, while older children and adults typically present with a higher ratio, reflecting developmental and metabolic differences across the lifespan.

Thyroid Ratio: Cellular Effects

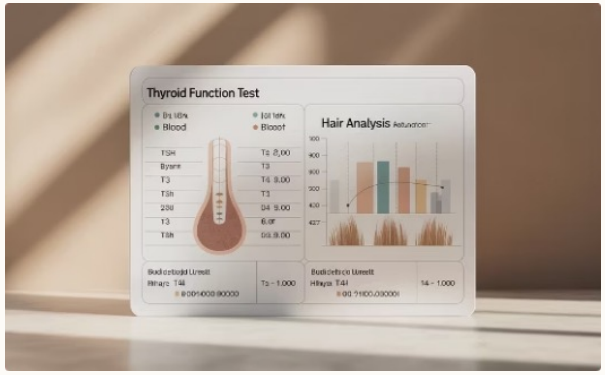
Cellular Thyroid Activity

The calcium/potassium ratio reflects thyroid hormone effects at the cellular level, which may differ significantly from blood tests. A ratio below 4 indicates excessive thyroid glandular effect, while a ratio above 4 suggests sluggish thyroid activity.



Regulatory Mechanisms

Thyroid activity regulates calcium metabolism, while potassium sensitizes tissues to thyroid hormone. Additionally, high hair calcium relates to reduced cell permeability, which may alter how thyroid hormones affect cells.



Beyond Blood Tests

This ratio provides insights that blood and saliva hormone tests cannot, as it measures cellular effects rather than circulating hormone levels, offering a complementary assessment approach.

Thyroid Ratio: Causes and Symptoms

Multifactorial Causes

The calcium/potassium ratio can be affected by numerous factors, making it a true "whole systems" indicator:

- Emotional and physical stress
- Nutritional depletion
- Autonomic nervous system imbalances
- Iodine antagonists in the environment
- Toxic metal accumulation

Clinical Manifestations

Low ratio symptoms include:

- Irritability and aggressiveness
- Anxiety and nervousness
- Muscle tightness and cramps
- Symptoms of calcium/magnesium deficiency

High ratio symptoms include:

- Fatigue and depression
- Hypoglycemia and sweet cravings
- Signs of copper toxicity
- Possibly low blood pressure

Thyroid Ratio: Psychological Correlations

The calcium/potassium ratio correlates strongly with psychological states. A low ratio is typically associated with extroversion, joy, and happiness - reflecting higher cellular energy and metabolic activity.

Conversely, a high ratio often corresponds with fatigue, depression, and in severe cases, despair and suicidal thoughts. This connection between mineral balance and mental health highlights the profound relationship between biochemistry and psychological wellbeing.

Additionally, a ratio greater than about 10 serves as an indicator of hidden copper toxicity, which itself is associated with numerous psychological symptoms including mood swings, anxiety, and depression.

Thyroid Ratio: Efforting and Movement Patterns

>100

Extreme Efforting

Pushing oneself very hard in an ineffective way, leading to diminishing returns

<4

Effective Movement

Fast, aggressive, sometimes uncontrolled forward momentum

>4

Stalled Movement

Slower progress with reduced effectiveness, especially with calcium shell

The calcium/potassium ratio provides fascinating insights into how a person approaches challenges and moves through life. A very high ratio (above 100) indicates someone who is pushing themselves extremely hard but in an ineffective manner - like pressing the gas pedal while the brake is engaged.

Lower ratios tend to correlate with more effective, sometimes aggressive movement patterns, while higher ratios suggest slower, potentially stalled progress. When combined with a calcium shell pattern, this can manifest as having "the brakes on" in life.

Thyroid Function and Energy Levels

Calcium/Potassium Ratio	Thyroid Function	Energy Impact
40 or above	Severely underactive	85% or more energy loss
20-40	Very underactive	75-85% energy loss
15-20	Moderately underactive	50-75% energy loss
10-15	Mildly underactive	30-50% energy loss
6-10	Slightly underactive	20-30% energy loss
4.7-6	Minimally underactive	10-20% energy loss
4.0	Optimal function	Maximum energy

If you have a tissue mineral analysis, you can immediately determine your thyroid efficiency by calculating your calcium-to-potassium ratio. The closer this ratio is to 4.0, the more energy you'll have, provided your actual mineral levels are also near optimal.

Mineral ratios are remarkably accurate indicators of glandular function. In over 125,000 hair analyses, Dr. Eck has consistently observed the same mineral patterns corresponding to specific energy states, making these ratios highly reliable diagnostic tools.

Limitations of Conventional Thyroid Testing

Blood Tests vs. Tissue Analysis

Standard blood tests for thyroid function measure thyroxin protein levels but miss crucial information about how effectively the thyroid is functioning at the cellular level.

Normal Levels, Poor Function

A person can have normal thyroxin levels in blood yet have a weak thyroid gland. The hormone may be circulating without being fully effective due to mineral imbalances.

Medication Limitations

Thyroid medication and cortisone provide only the illusion of energy rather than addressing underlying mineral imbalances. They don't strengthen glands but often create dependency.

People taking thyroid medication often remain tired despite treatment. These medications provide temporary spurts of drug-induced "well-being" but never deliver the sustained power of naturally balanced energy production. This explains why many patients require lifelong medication rather than experiencing true healing.

The Sodium/Magnesium Ratio: The Adrenal Ratio

Ideal Ratio: 4.17

According to Dr. Eck's research, this represents optimal adrenal function at the cellular level

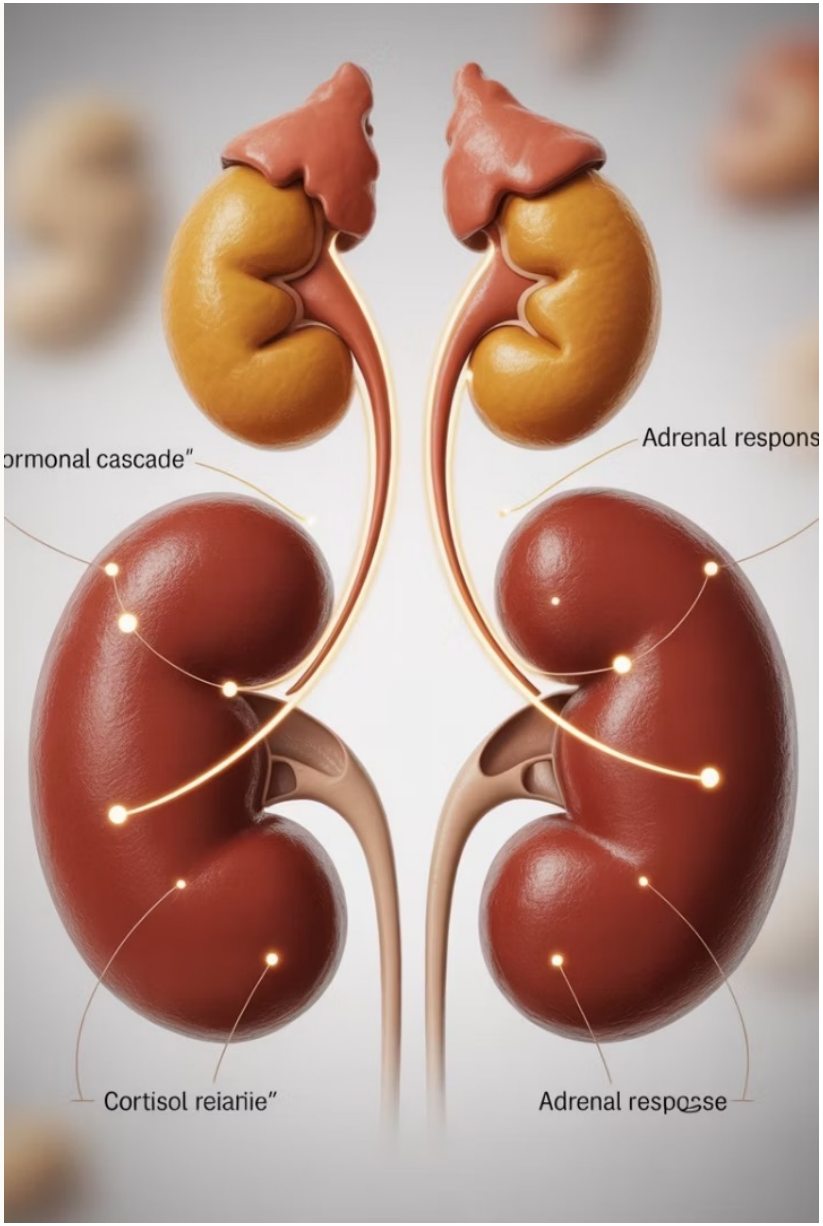
Healthy Range: 2-6.5

This range indicates balanced adrenal activity supporting proper metabolism and stress response

Adrenal Effect Indicator

This ratio reflects how adrenal hormones are affecting cells throughout the body

The sodium/magnesium ratio, known as the adrenal ratio, provides critical insights into adrenal gland function at the cellular level. This ratio complements the sodium/potassium ratio in assessing the body's stress response capacity and overall vitality.



Adrenal Ratio: Cellular Effects and Testing Differences (Na/Mg Ratio)

Cellular Adrenal Effects

A sodium/magnesium ratio above 4.17 indicates excessive adrenal and thyroid effects at the cellular level. This often manifests as heightened stress response and increased metabolic activity.

Conversely, a ratio below 4.17 suggests reduced adrenal and thyroid effects at the cellular level, typically associated with adrenal fatigue and diminished stress response capacity.

Different From Other Hormone Tests

Hair analysis adrenal assessment will not always match cortisol and other hormone levels measured in serum, urine, or saliva. This is because hair analysis measures cellular effects rather than circulating hormone concentrations.

This distinction makes hair mineral analysis complementary to, rather than redundant with, conventional hormone testing. It provides insights into how hormones are actually affecting cells, regardless of their measured levels in bodily fluids.

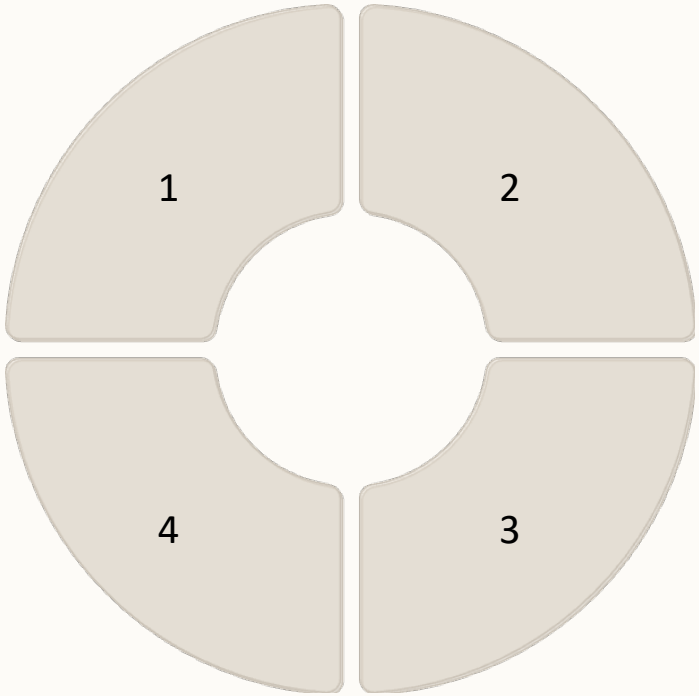
Adrenal Ratio: Causes of Imbalance

Autonomic Imbalance

Dysfunction in the autonomic nervous system affecting adrenal regulation

Nutritional Deficiencies

Lack of key nutrients needed for proper adrenal function



Toxic Metal Excess

Accumulation of heavy metals interfering with adrenal physiology

Excessive Stress

Physical, emotional, or chemical stressors overwhelming the body

The sodium/magnesium ratio is truly a "whole systems" indicator, reflecting the complex interplay of multiple bodily systems. Imbalances in this ratio rarely have a single cause, but instead result from a combination of factors affecting overall health and resilience.

Understanding these multifactorial causes allows practitioners to develop comprehensive healing protocols that address the root issues rather than merely treating symptoms.

Adrenal Ratio: Signs and Symptoms

High Ratio Symptoms

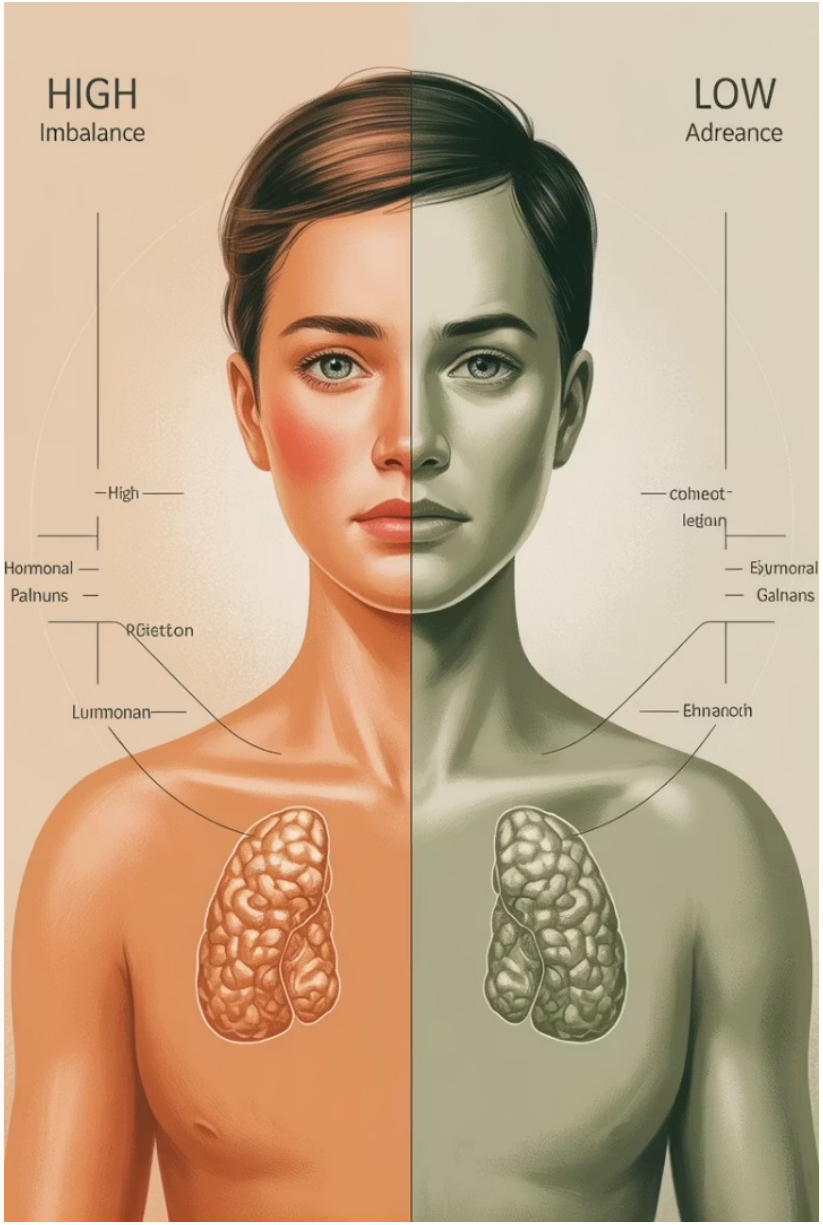
- Anxiety and irritability
- Higher blood pressure
- Elevated blood sugar
- Anger and acute stress reactions
- Difficulty relaxing or sleeping

Low Ratio Symptoms

- Chronic fatigue
- Lower blood sugar in most cases
- Low blood pressure
- Reduced body temperature
- Cravings for sweets and salt

Clinical Significance

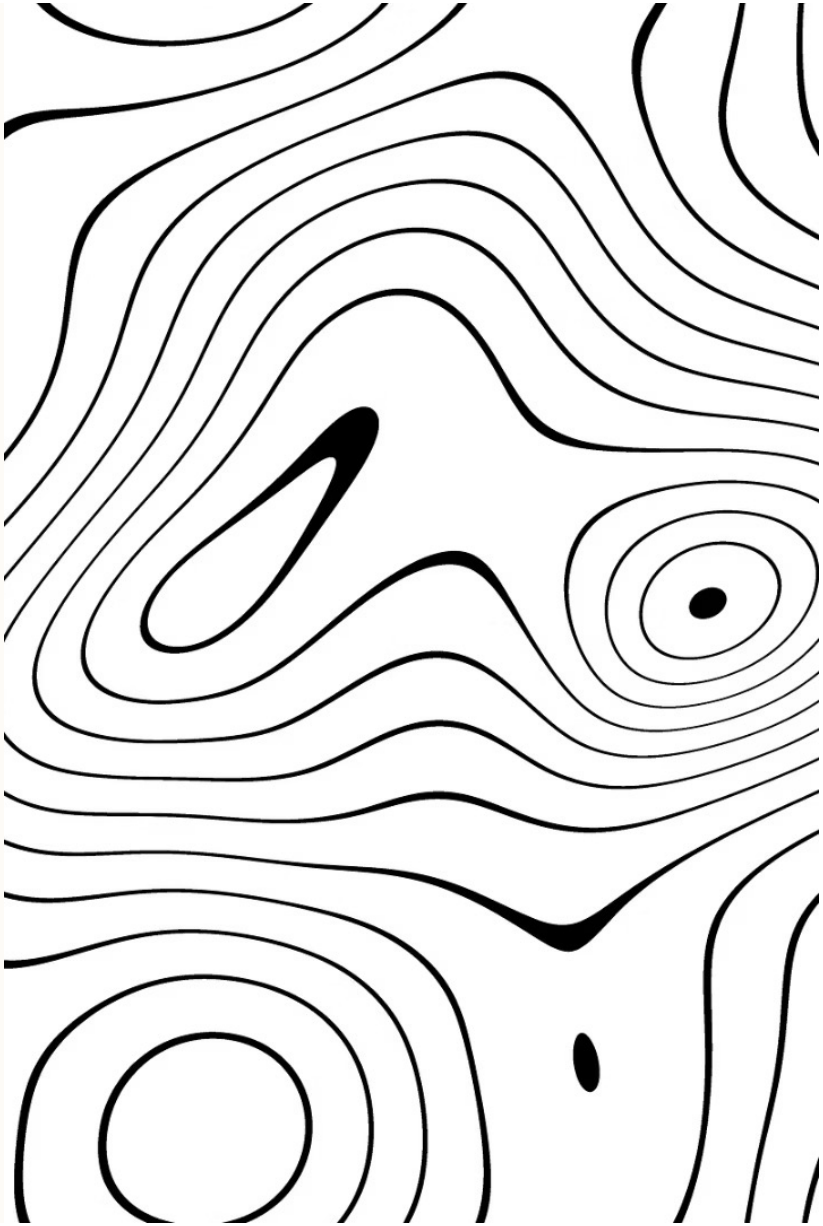
- Helps identify subclinical adrenal issues
- Guides nutritional supplementation
- Monitors progress during healing
- Complements other diagnostic methods



Mineral Patterns: Calcium to Phosphorus Ratio

The calcium/phosphorus ratio in hair mineral analysis indicates the autonomic state of a person. A ratio below 2.5 shows a sympathetic state. A ratio above 2.5 indicates a more parasympathetic state.

This ratio relates to adrenal and thyroid activity. Dr. Melvin Page studied this relationship extensively.



Understanding Autonomic Balance

Sympathetic System

The "fight-or-flight" system

Activates brain and muscles

Speeds up body processes

Expends energy (catabolic)

Parasympathetic System

The "rest and digest" system

Activates digestive organs

Conserves and nurtures

Rebuilds the body (anabolic)

Mineral Properties and Functions

Phosphorus

Fiery and explosive element

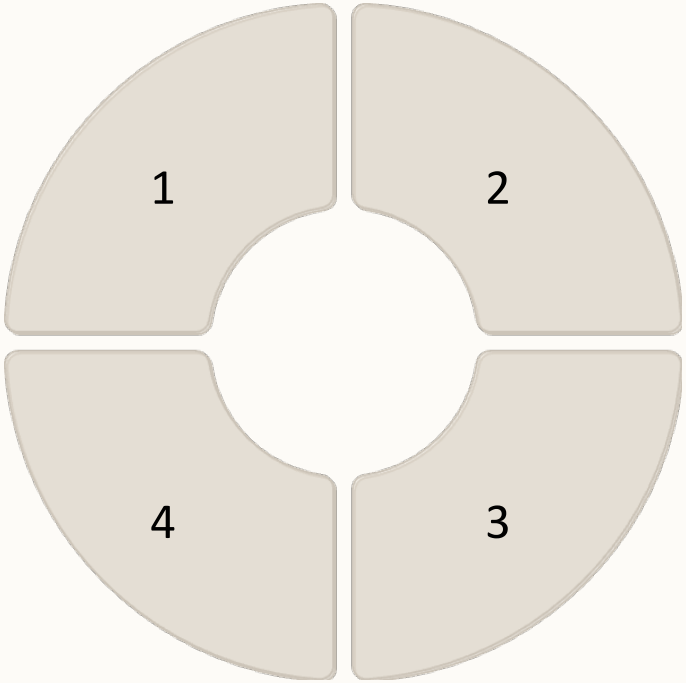
Key component in ATP energy molecules

High levels indicate sympathetic state

Ideal Ratio

2.5:1 calcium to phosphorus

Indicates balanced autonomic function



Calcium

Cold, hard and static element

Provides structure to bones and teeth

High levels indicate parasympathetic state

Imbalance Causes

Poor diet, stimulants, negative thinking

Physical/emotional trauma, toxic metals

Autonomic Dominance Patterns

Sympathetic Dominance

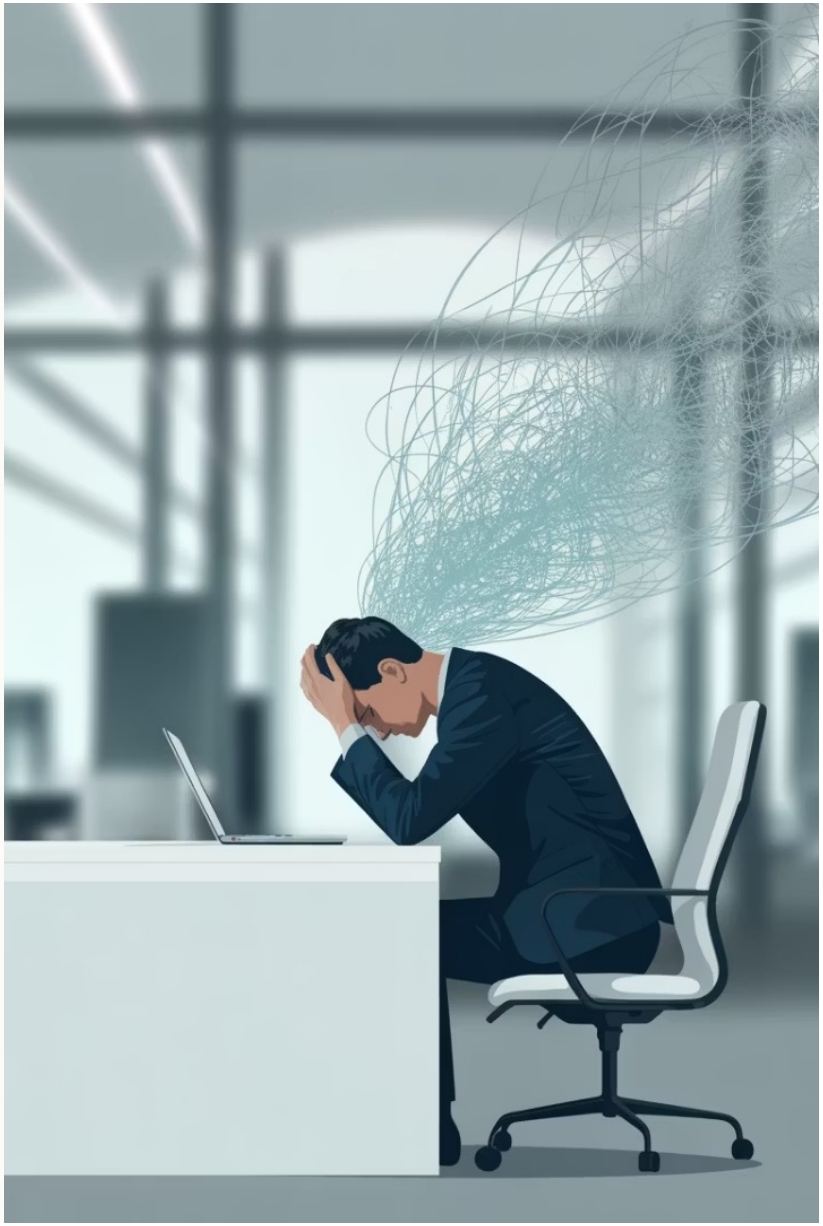
Most people are sympathetic dominant. Mild cases are energetic and optimistic. Excessive cases show anxiety, overworking, and compulsiveness.

Parasympathetic Dominance

Healthy cases are rare - relaxed, present-focused individuals. Unhealthy cases have "given up" on life and won't fight for anything.

Burned Out Sympathetic

Common pattern showing high calcium/phosphorus ratio (parasympathetic state) with high sodium/potassium ratio (sympathetic dominance).



What is my #1 most common symptom?

- FATIGUE ie energy deficit in the cells!!!

How Your Body Produces Energy

Glandular Function

How the thyroid and adrenals produce your body's energy. These glands are responsible for converting nutrients into usable energy, regulating your metabolism and determining your overall vitality.

Nutritional Impact

How nutrition affects your thyroid and adrenal function. The minerals in your diet directly influence the efficiency of your energy-producing glands, creating either balance or dysfunction.

Stress Effects

Uncontrolled stress causes fatigue and accelerates aging. Chronic stress depletes mineral reserves and disrupts the delicate balance needed for optimal energy production.

Understanding the biological mechanisms of energy production is essential for addressing fatigue and burnout. Your thyroid and adrenal glands work together to create cellular energy, but they require proper mineral balance to function optimally.

The Burnout Phenomenon

Initial Stress Response

Burnout begins with the body's attempt to adapt to excessive stress

Energy Depletion

Mineral reserves become exhausted as adaptation continues

Functional Collapse

Eventually the body's energy systems can no longer compensate

Burnout is not simply feeling tired - it's a profound physiological collapse of the body's energy-producing systems. This condition affects people in all occupations and at all ages, even children. The psychological symptoms of burnout are secondary to the underlying mineral imbalances and glandular dysfunction.

The Chemistry of Burnout: Early Stages

Thyroid Overactivity

During early stress stages, the thyroid gland increases activity to mobilize the body against stress. This is the resistance stage of the stress response.

Adrenal Compensation

Adrenal glands increase activity, raising cholesterol levels as raw material for stress hormone production. This is a defense mechanism, not a disease.

Mineral Shifts

Calcium and magnesium levels drop as the body reduces its "braking system" to accelerate metabolism. Simultaneously, sodium and potassium rise to support increased adrenal activity.

During the early stages of stress, the body makes multiple adaptations to increase energy production. These changes are initially protective but become destructive when prolonged. Understanding these biochemical shifts is essential for properly addressing burnout rather than treating symptoms.

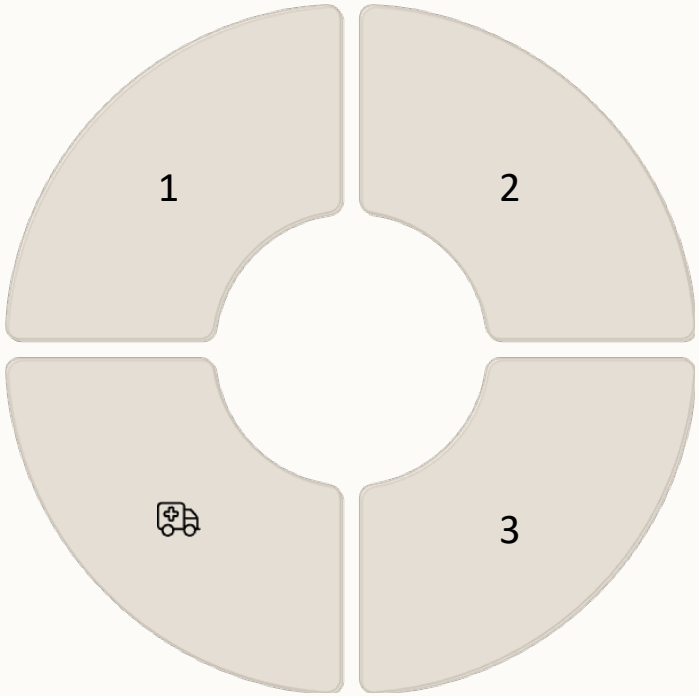
The Chemistry of Burnout: Final Stages

Adrenal Collapse

Unrelenting stress eventually results in adrenal burnout, characterized by dropping sodium and potassium levels

Calcium Increase

As the body slows down, calcium and magnesium levels rise to increase the braking system



Mixed States

When one gland exhausts before the other, mood swings and manic-depression tendencies may develop

Thyroid Slowdown

Rising calcium levels automatically slow thyroid function, further reducing energy production

The more extreme the exhaustion, the higher the calcium and magnesium levels rise. A calcium to magnesium ratio over 25:1 indicates such severe exhaustion that the person often finds it impossible to rebuild their life. Their true feelings become deeply buried and difficult to access.

This biochemical understanding explains why conventional approaches often fail - they treat symptoms rather than addressing the fundamental mineral imbalances driving the burnout process.

Nutritional Fallacies and Burnout Recovery

1. Replacement Theory Flaws

The most dangerous nutritional fallacy is that everyone under stress needs additional vitamin C, E, B-complex, selenium, and zinc. This "replacement theory" can be potentially harmful for burnout victims.

2. Defensive Deficiencies

A so-called deficiency could actually be beneficial - part of the body's defense system. For example, a zinc "deficiency" may be compensating to increase adrenal activity.

3. Toxic Metal Functions

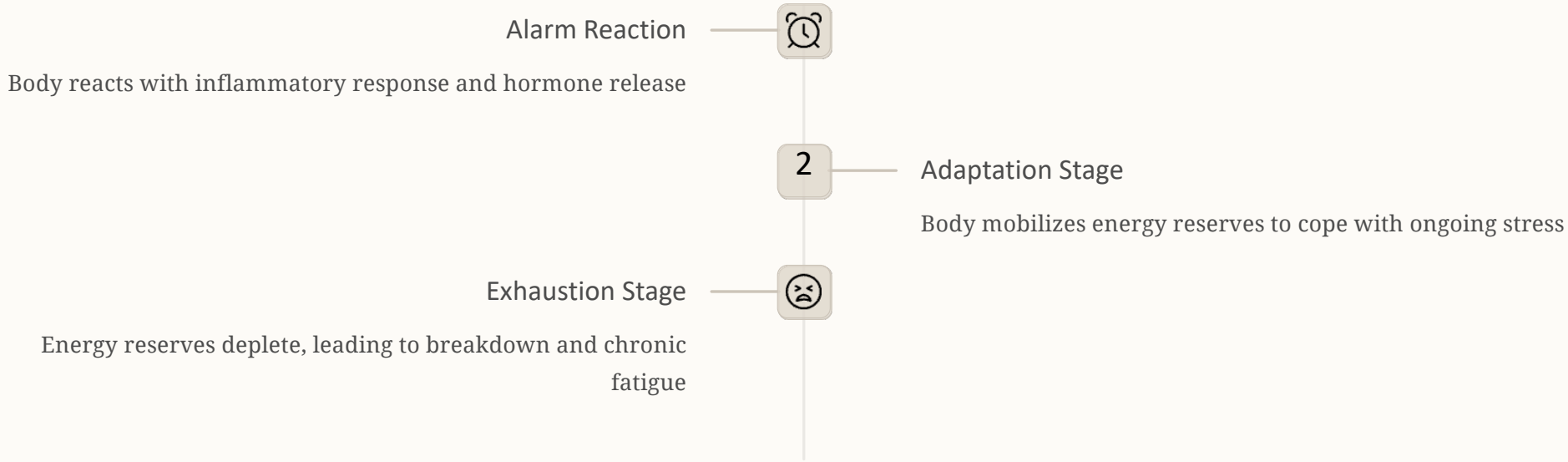
Heavy metals like lead and cadmium often serve as backup systems when primary nutritional minerals are insufficient. Removing them too quickly can trigger collapse.

4. Stimulation Dangers

Stimulating a burnout victim with vitamins may provide temporary improvement while causing long-term damage by depleting remaining energy reserves.

Traditional nutritional approaches often fail to understand why deficiencies exist. Is it from inadequate intake, or because excess of another nutrient is blocking absorption? Without understanding these complex relationships, supplementation can worsen burnout rather than improve it.

Uncontrolled Stress Causes Fatigue and Accelerates Aging



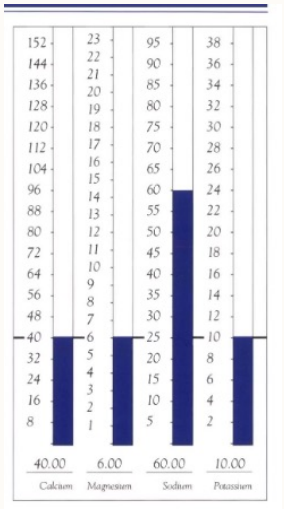
To counteract stress, the body mobilizes all available energy. If sufficient energy is available, health is restored. However, when energy reserves are insufficient, the body attempts to adapt, which further depletes resources. This "general adaptation syndrome" progresses through distinct phases that can be identified through mineral analysis.

Each phase has specific mineral patterns that reflect the body's changing strategy for managing stress. Understanding these patterns allows for targeted intervention before complete exhaustion occurs.

The Three Phases of Stress Response- Hans Selye

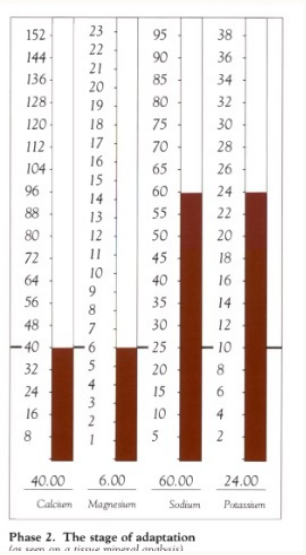
Alarm Reaction

The body reacts to acute stress with an outpouring of adrenal hormones that mobilize energy. This inflammatory process is characterized by high sodium relative to potassium (ratio above 2.5:1) and represents the body's initial defense against stressors.



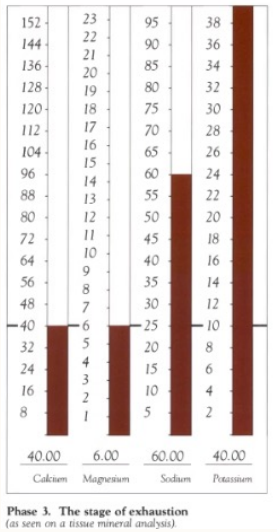
Adaptation Stage

If stress continues, the body attempts to adapt by releasing anti-inflammatory hormones. Potassium levels rise to balance sodium (ratio normalizes to around 2.5:1), creating a "cold war" state where the body manages stress without resolving it.



Exhaustion Stage

Eventually, the body exhausts its energy reserves and begins to break down. Sodium levels drop relative to potassium (ratio falls below 2.5:1), resulting in chronic fatigue - the most universal complaint in modern society.



Dr. Hans Selye discovered that even slight strain causes the body to use vitamins and minerals in excess of normal needs. People under constant stress from financial worries, business pressures, or family problems deplete nutritional reserves daily, creating mineral imbalances that further reduce stress resilience.

Chronic Fatigue is Premature Aging

Healthy Vessel vs Calcified Vessel

Brain Activity Map

When your body is chronically fatigued, one of two things happens: either you use up minerals too quickly (fast oxidation) or you cannot utilize minerals properly, causing them to deposit in tissues (slow oxidation). Either route leads to premature aging.

By balancing body chemistry, minerals can be used at a proper rate, eliminating excess fatigue and preventing or reversing premature aging. The process is the same whether you're 20 or 65 - exhaustion accelerates aging regardless of chronological age.

Energy and Emotional Wellbeing

Relationship Impact

How fatigue can ruin a good personal relationship. Energy deficiency affects your ability to connect emotionally and respond appropriately to others.

Trauma Recovery

How nutritional balancing can help you overcome traumatic experiences in your past by restoring the energy needed for emotional processing.

Emotional Stability

The connection between mineral balance and mood regulation, creating the biochemical foundation for emotional resilience.

Energy is not just physical - it's the foundation of emotional wellbeing. A decline in energy reduces our ability to express ourselves, accept new ideas, and try new things. What is often called the "conservatism" of old age is frequently just the inevitable consequence of energy depletion.

How Oxidation Types Affect Aging

Slow Oxidation

Slow oxidizers age through mineral accumulation - like a woodstove not getting enough air. Combustion is incomplete, creating "clinkers" that clog the system. Their bodies literally suffocate as deposits build up in tissues, leading to rigidity.

Fast Oxidation

Fast oxidizers are just as tired but speed up to compensate. They burn through reserves quickly - like a fire getting too much air. They appear youthful because their tissues remain pure, but they risk sudden collapse when resources deplete.

Aging Progression

Most people are "fast oxidizers" early in life, become "mixed oxidizers" as one gland weakens, and eventually become "slow oxidizers" as both glands weaken. 95% of people die as slow oxidizers.

Aging is essentially chronic slow oxidation. The tragedy of modern life is that many young people have become chronic slow oxidizers while still in their teens, explaining widespread fatigue among youth. Excess fatigue and premature aging can be addressed through nutritional balancing to restore optimal energy production.

Vigorous Exercise: False Sense of Health

Exercise Benefits

Exercise improves circulation, relieves tension, and can enhance energy by stimulating adrenal activity. It creates a natural rhythm that many find beneficial for overall wellbeing.

Endorphin Effect

Vigorous exercise releases narcotic-like substances from the brain and pituitary gland, creating a "natural high" that masks underlying fatigue and mineral imbalances.

Mineral Mobilization

Exercise moves minerals from storage into active use, providing temporary energy but potentially depleting reserves if not properly replenished through targeted nutrition.

Many exercisers feel terrible when they miss workouts because they've come down from their endorphin high - they've returned to their true energy state. This addiction to exercise-induced endorphins can prevent people from addressing the underlying mineral imbalances causing their fatigue.

Exercise is necessary for optimal health, but it's no substitute for balanced nutrition. The best approach combines appropriate exercise with targeted nutritional balancing based on individual mineral patterns.

Why Diet Alone Won't Solve Energy Problems

Too Random

Diet is too random an approach to break deeply-set mineral patterns. You can't control the exact mineral content of foods or measure portions precisely enough to correct specific imbalances.

Supportive Role

Diet is essential for supporting a nutritional balancing program but isn't powerful enough to create transformative energy increases on its own.

Incomplete Solution

While improving diet is beneficial, it lacks the precision needed to correct specific mineral ratios that determine energy production efficiency.

Precision Needed

Targeted supplementation based on mineral analysis provides the specific nutrients needed to correct individual imbalances that diet alone cannot address.

Many people claim different health food diets have rejuvenated them, but long-term observation often reveals continued struggles with the same problems. This pattern of temporary enthusiasm followed by seeking the next dietary solution suggests limited lasting benefit from diet changes alone.

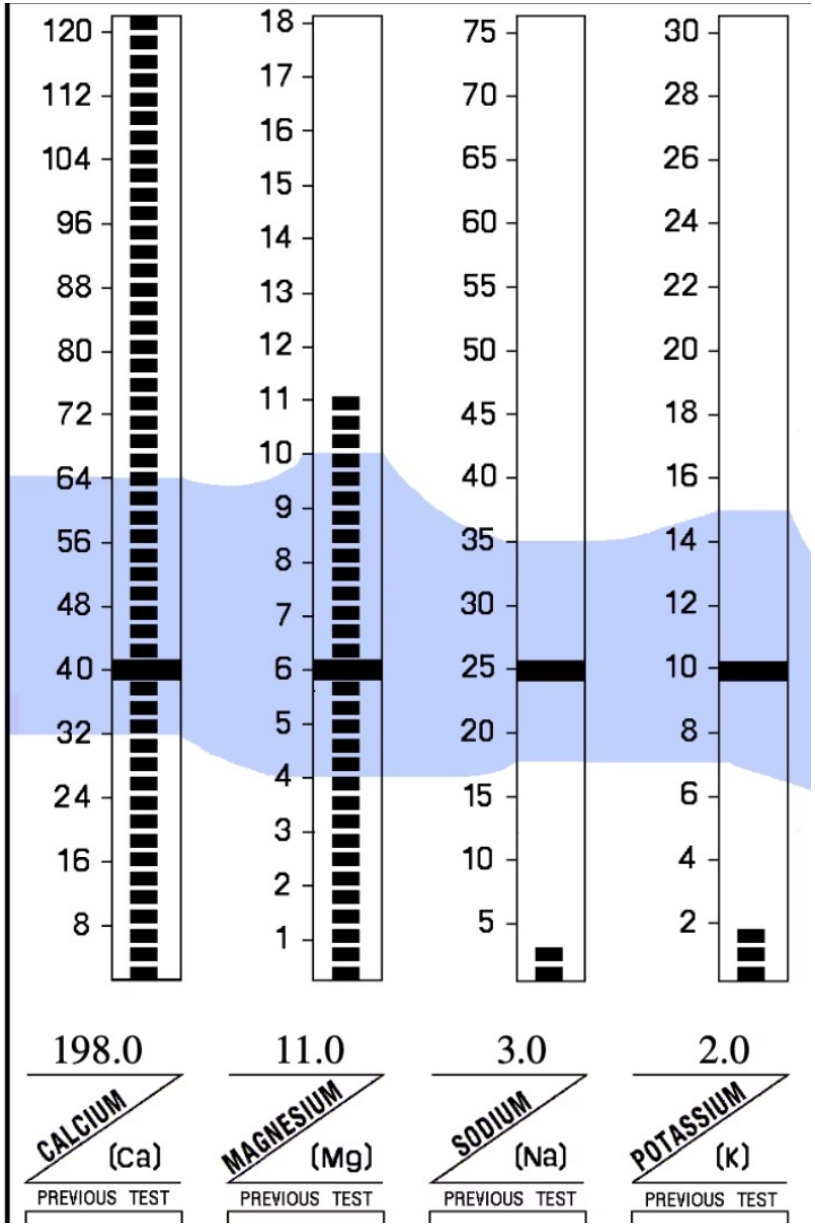
The Vital Connection: Energy and Mental Health

The relationship between our energy levels and mental health is profound yet often overlooked. High vitality is not just about physical stamina—it's a fundamental requirement for adequate mental activity, emotional processing, and psychological healing.

When our adaptive energy is low, the body may suppress feelings, memories, and perceptions as a protective mechanism. This can manifest as various mental health conditions, from depression to emotional withdrawal, and even contribute to suicidal tendencies in severe cases.

Calcium Shell Example

- The cause for calcium deposition is usually related to low sodium and potassium levels and possibly a magnesium imbalance. These imbalances prevent calcium from remaining in an ionized form in the blood. This in turn causes calcium to precipitate into the soft tissues. This is akin to calcium deposits on faucets in areas with hard water. Water softeners solve the problem by adding sodium or potassium to the tap water. These minerals solubilize calcium.
- Correcting a high hair calcium level involves increasing the sodium and potassium levels in the tissues. This requires improving adrenal gland activity and increasing the metabolic rate. This raises the aldosterone level, which retains more sodium and potassium in the body. Also, improving cellular energy production enhances the activity of the sodium pump mechanism, which also keeps the electrolytes in balance.



Calcium shell

- A very high hair calcium level may be due to, or involved with a tendency for psychological withdrawal, defensiveness, or a protective stance - hence the term calcium shell. Calcium has a calming or numbing effect on nervous system activity. It raises the voltage at which nerve cells fire. Therefore, a high tissue calcium diminishes the sensitivity and reactivity of the nervous system.
- On the positive side, this reduces the effects of stress on the body. On the negative side, it can cause fatigue, apathy, depression, detachment, withdrawal and impair one's ability to express emotions.
- Possible psychological reasons for the shell are:
  - one is overwhelmed by stress
  - one does not handle stress adequately
  - one may be very sensitive, or for some other reason feels the need for protection against stress.

Calcium Shell Correction

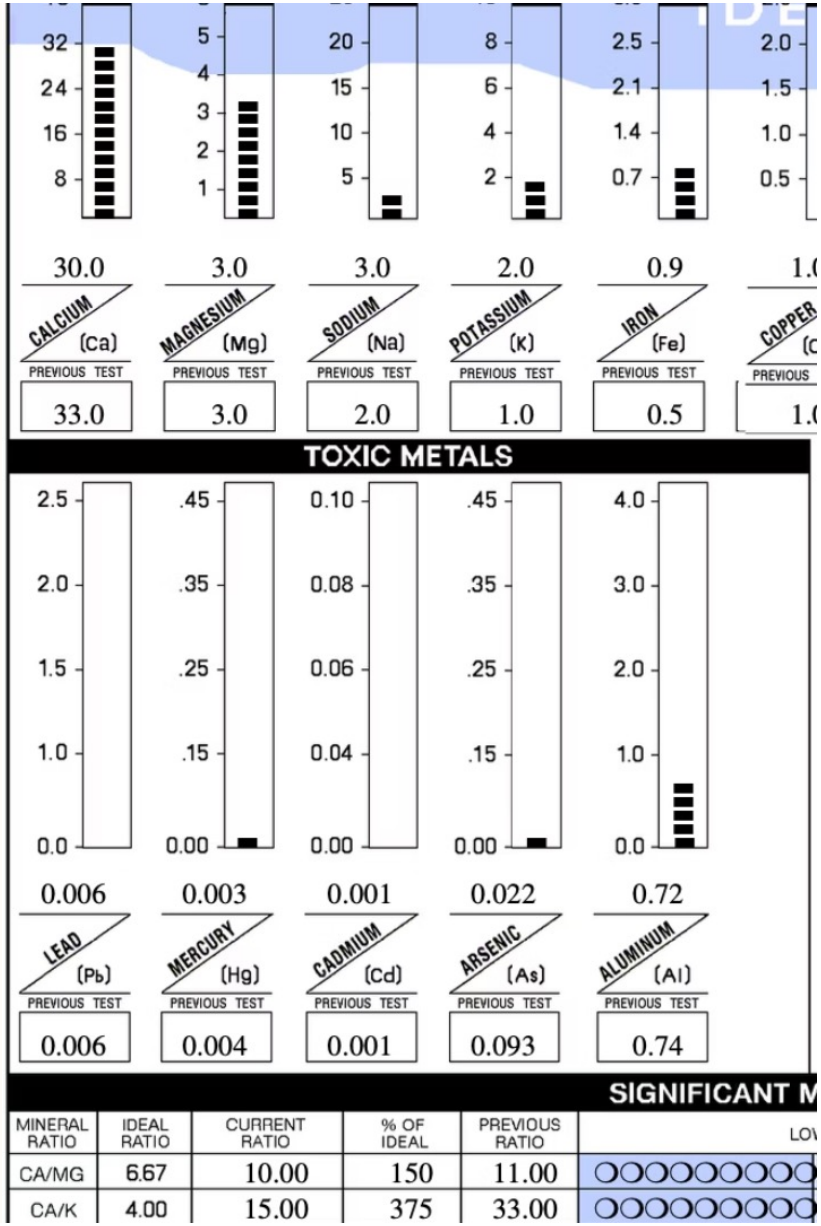
- Correcting a calcium shell involves correction of slow oxidation, support of adrenal and thyroid glandular activity, correction of copper imbalance and correction of any other contributing causes.
- Emotional support and learning new coping mechanisms can be of great importance to correct a calcium shell. Sometimes one needs to learn how to detach from stress through techniques such as meditation. Some clients need to learn self-love, confidence in themselves, courage and healthy ways to express themselves.

Understanding Sympathetic Dominance

Sympathetic dominance is a critical mineral pattern seen on hair mineral analyses in at least half of all cases. It represents an imbalance in the autonomic nervous system where a person overuses the sympathetic ("fight-or-flight") branch, which should only be activated during emergencies.

This pattern is defined by a slow oxidation rate AND a potassium level of 4 mg% or less and/or a sodium/potassium ratio greater than about 4. The lower the potassium or the higher the sodium/potassium ratio, the more severe the pattern.

People with sympathetic dominance tend to push themselves constantly, living in a perpetual "second wind" mode. They often appear busy, anxious, and have difficulty relaxing—identifying themselves by what they do rather than who they are.



Causes and Symptoms of Sympathetic Dominance

Physical Causes

- Nutritional depletion leading to adrenal exhaustion
- Copper toxicity (present in all cases)
- Toxic metals irritating the nervous system
- "Three amigos": excess aluminum, manganese, and iron

Mental Causes

- Tendency to push oneself
- Belief that relaxation is "lazy" or "unproductive"
- Overactive, analytical mind
- Excessive worrying

Common Symptoms

- Fatigue (often unrecognized until slowing down)
- Excessive physical activity
- Anxiety and worry
- Overactive mind
- Underlying depression and fear
- Reduced libido in some cases

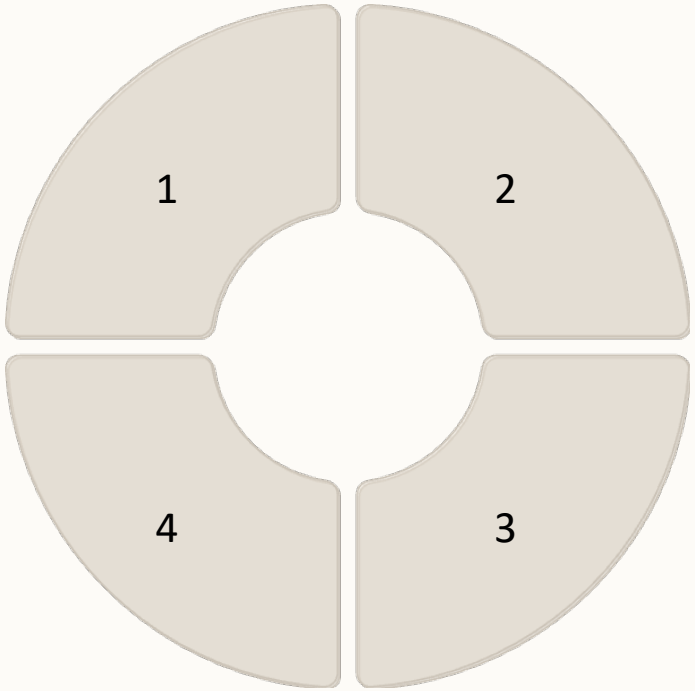
Variants and Combinations of Sympathetic Dominance

Burned Out

Low potassium with sodium/potassium ratio less than 2.5, indicating long-term or extreme sympathetic dominance leading to adrenal exhaustion.

Trying Too Hard

Sympathetic dominance with calcium level above 165 mg% (calcium shell), indicating psychological protection.



Hunted

Extreme pattern with potassium level of 1 mg% or less, Ca/K ratio greater than 200, and Na/K ratio of 4 or more.

Wasting One's Time

Potassium of 4 mg% or less, combined with a calcium shell and a calcium/magnesium ratio of 13.5 or higher.

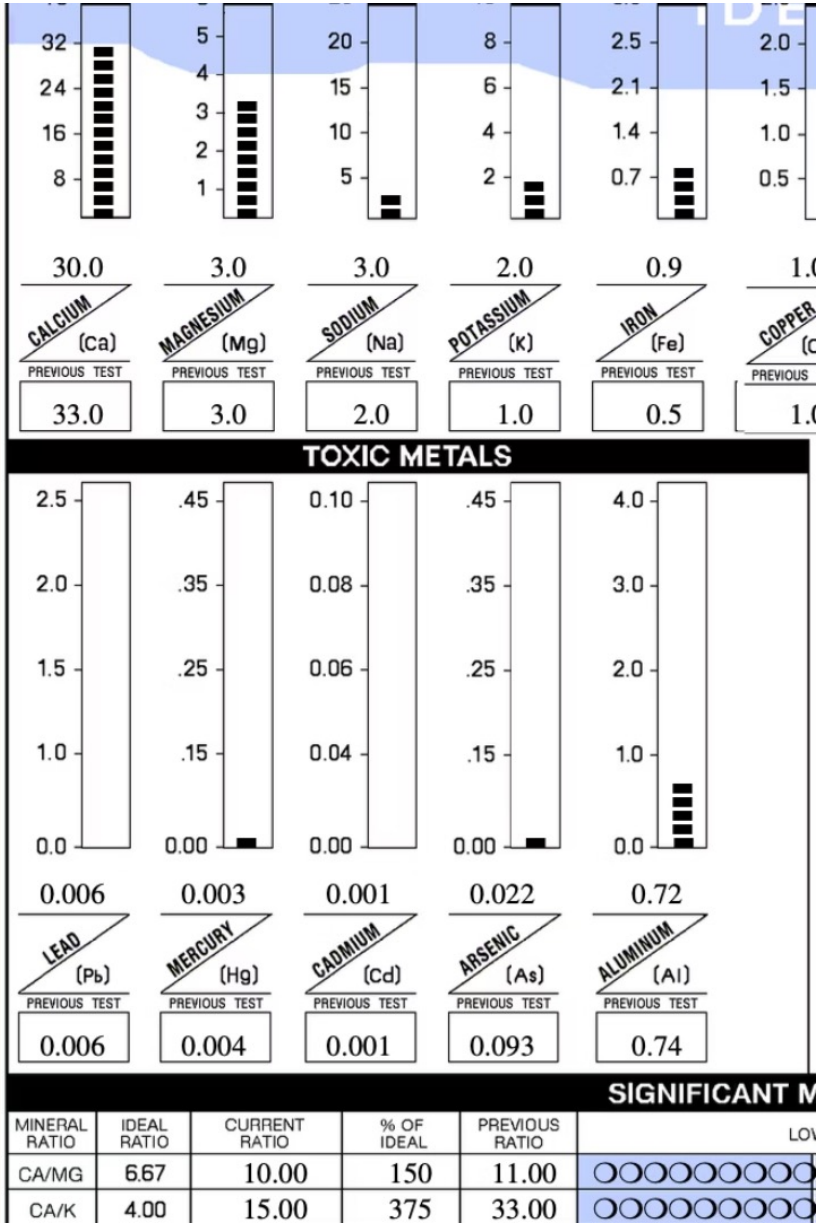
The severity of sympathetic dominance can be quantified by counting the number of indicators present on a hair chart. It's possible to have ten or even fifteen sympathetic dominance indicators, with each level of severity requiring specific adjustments to treatment protocols.

Understanding the Four Lows Pattern

Four lows is a special mineral pattern revealed only through hair mineral testing that requires a unique approach to healing. Most physicians and healers who use hair mineral testing don't recognize or understand this pattern, making it difficult for patients to find effective treatment.

This pattern occurs when hair mineral levels show calcium less than 40 mg%, magnesium less than 6 mg%, sodium less than 25 mg%, and potassium less than 10 mg%. For accurate assessment, the hair sample must not be washed at the laboratory, as this can make it difficult or impossible to discern this important pattern.

People with four lows often report feeling like they're "spinning their wheels" - working hard but getting nowhere. Many have consulted numerous doctors without success because this pattern requires a special, counter-intuitive approach to healing.



Two Types of Four Lows Patterns

Initial Test Four Lows

Indicates a collapse and exhaustion state that can last for years if not corrected. Often chronic and requires specific intervention.

Retest Four Lows

When following a development program, this is actually a healing or retracing process. It's not negative but indicates the body is in a repair phase.

Increasing Prevalence

Four lows pattern has become more common over the past forty years, reflecting changes in our environment, diet, and lifestyle stressors.

Understanding which type of four lows pattern you're dealing with is crucial for proper treatment. The initial pattern represents a state of collapse, while the retest pattern during a development program is actually a positive sign of healing and reconfiguration.

Four lows on an initial test can be understood as a car spinning its wheels in a ditch, a disconnect in the hypothalamus-pituitary-adrenal axis, or a shut-down sequence as the body prepares for decline. It's a state where the normal protective mechanisms aren't functioning properly.

Common Causes and Symptoms of Four Lows

Lifestyle Cave-In

Feeling overwhelmed from job loss, illness, disability, or other stressors combined with toxicity from unhealthy diets. Most common cause in America.

Nutritional Depletion

Collapse due to extreme diets, refined foods, and environmental toxins that deplete the body of essential nutrients.

Mental Exhaustion

Intense mental activity without proper rest, leading to nervous system "crashes" and burnout.

Attitude Patterns

Working too hard, being too hard on oneself, compulsive tendencies, or intense negative emotions that wear down the body.

Common symptoms include fatigue, allergies, anxiety, irritability, insomnia, muscle tightness, hidden copper toxicity, impaired digestion, and food intolerances. If the pattern persists for years, it may increase risk for degenerative diseases.

The four lows personality often includes intense, productive, driven individuals who are self-critical, work very hard, and don't know how to relax. Many are frustrated, negative, and cynical, with a tendency toward perfectionism.

Correcting the Four Lows Pattern

Rest More

Slow down your pace of life, get more sleep, and practice relaxation techniques.

Special Nutrition

Follow a specific supplement program with calcium, magnesium, zinc, digestive aids, taurine, fish oil, vitamin D, and kelp.

Avoid Stimulants

Eliminate all supplements that boost adrenal or thyroid activity, including B-complex, vitamin C, E, glandulars, and stimulating herbs.

Mental Correction

Reduce worry, fear, compulsiveness, anger, and other negative emotions that block healing.

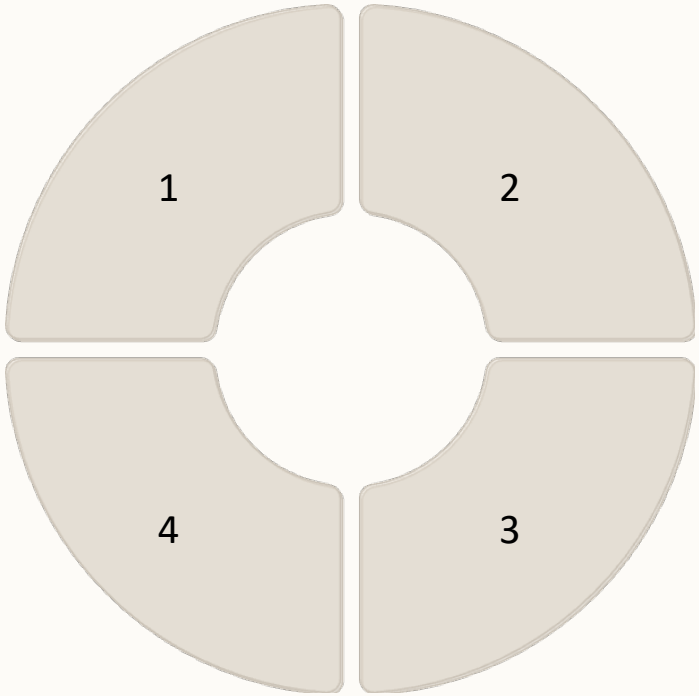
The correction of four lows depends on suppressing or turning off the sympathetic nervous system enough so that the adrenal and thyroid glands can rest and rebuild. This is analogous to slowing down the wheels of a car that are spinning out of control.

Warning: Taking thyroid hormone or other hormones when in a four lows pattern is generally harmful. Many people are driven into a four lows pattern by taking thyroid replacement hormones or supplements that enhance adrenal and thyroid activity.

Special Considerations and Variations

Low Four Lows

Extremely low levels of macrominerals indicate a more severe pattern that may take longer to correct.



Four Lows with Low Na/K

A more severe pattern indicating lower vitality that may require more time to emerge from.

Deep Anger Pattern

When four lows persists for years despite following a program, often due to negative emotions and cynicism.

Children with Four Lows

May be paralleling a parent's pattern, born depleted, or experiencing abuse or stress.

When handled properly, all cases of four lows can be corrected. With a properly designed development program, the pattern typically resolves within about six months, though occasionally it may take up to a few years.

Humor is especially helpful for those in a four lows pattern who are often too intensely negative in a way that blocks healing. A daily dose of humor, relaxing music, and happy activities can help inhibit excessive sympathetic nervous system activity and promote healing.

The Bowl Pattern: Feeling Stuck in Life

The bowl pattern is defined by a low sodium/potassium ratio (less than 2.5) combined with a high calcium/magnesium ratio (greater than 9.5).

This pattern reveals when someone feels mentally or emotionally stuck with few options.

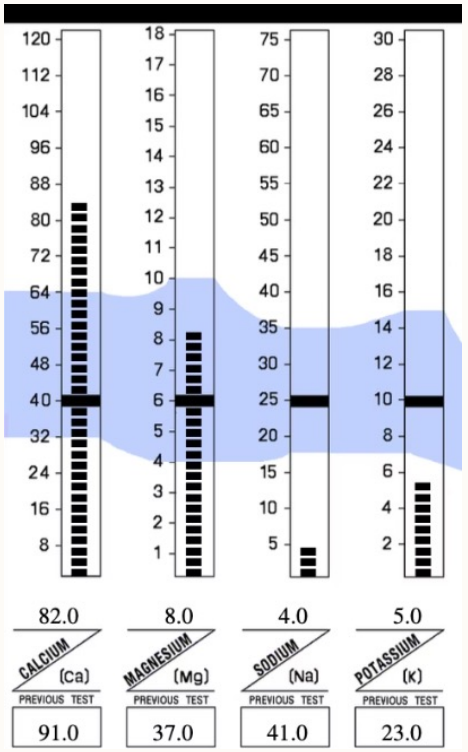
Understanding the Bowl Pattern

Low Sodium/Potassium

Associated with exhaustion, chronic stress, frustration, resentment and hostility.

High Calcium/Magnesium

Indicates defensiveness, possibly defending unhelpful lifestyle factors or attitudes.



The combination creates a feeling of being trapped - like a spider in a toilet bowl.

Bowl Pattern Variants

Oxidation Variants

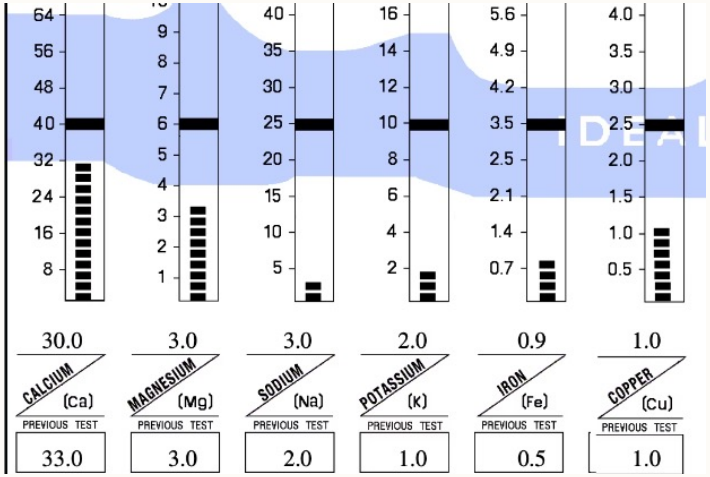
Fast oxidizer bowl and slow oxidizer bowl affect energy production.

Depth Variants

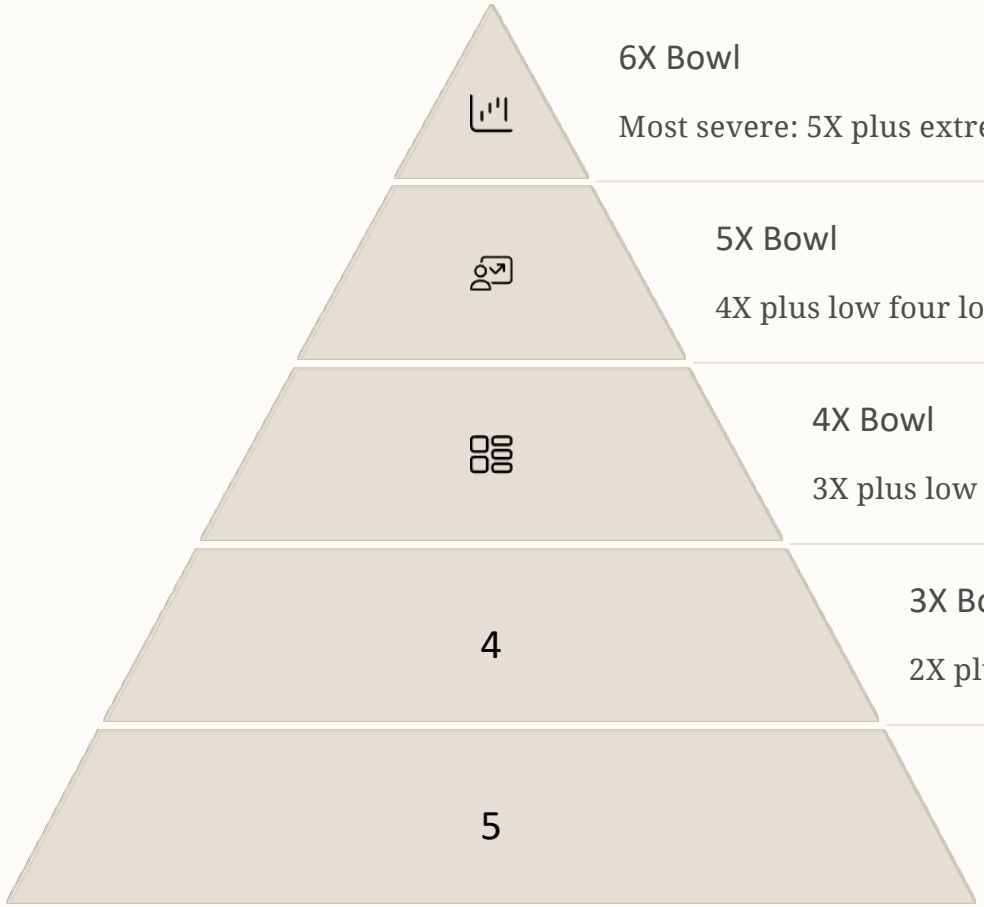
Deep, shallow, low, high, and drastic bowls indicate severity.

Multiple Bowls

Double, triple, and large bowls (5-8 minerals) show broader life impact.



Quantifying Bowl Patterns



6X Bowl

Most severe: 5X plus extreme/deep bowl

5X Bowl

4X plus low four lows on both mineral sets

4X Bowl

3X plus low four lows on one mineral set

3X Bowl

2X plus mild four lows pattern

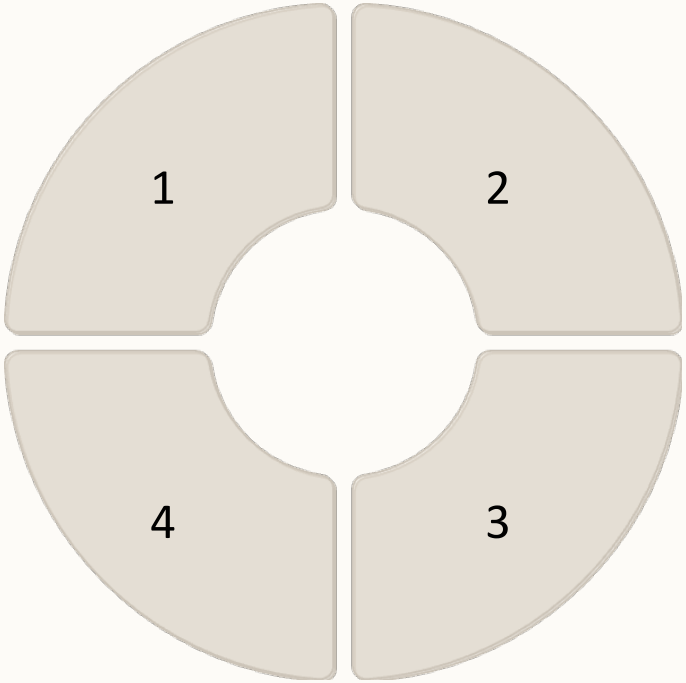
2X Bowl

Double bowl or extreme/deep bowl

Deeper Meanings of the Bowl Pattern

Yin Deficiency

In acupuncture terms, represents emptiness in body energy systems.



Feeling Lost

Indicates confusion or being clueless - opposite of the "knowing" Hill pattern.

Nutritional Imbalance

Often resolves with proper nutritional support and lifestyle changes.

Planned Life Situation

May represent temporary entrapment for learning important life lessons.

Energy as the Foundation of Mental Processing

Mental Activity

High vitality is required for adequate mental function. When energy is low, the body will suppress or block feelings, memories, perceptions and other mental activities.

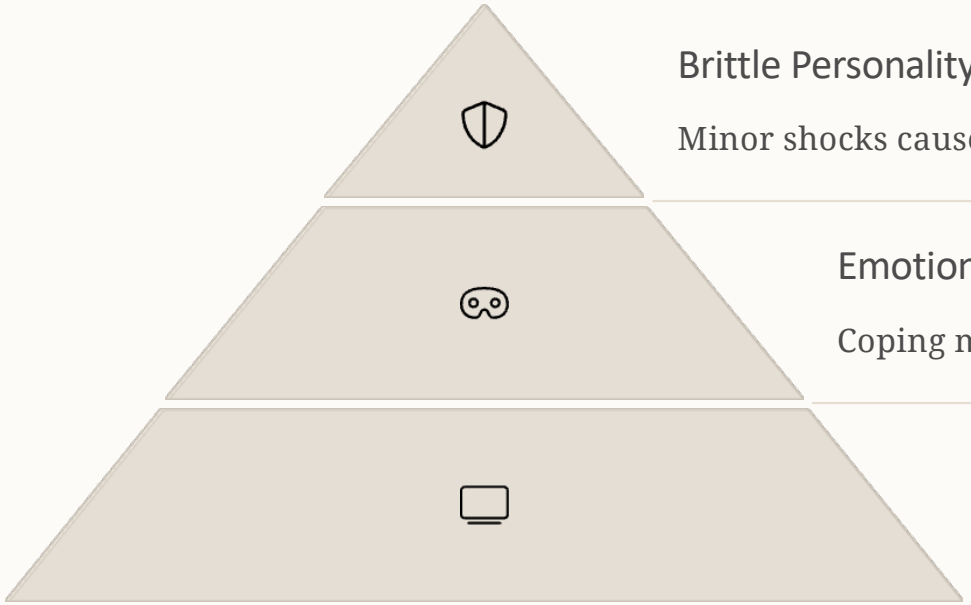
Emotional Processing

Energy is required even to feel feelings. As energy declines, a person simply cannot process their experiences as effectively.

Trauma Healing

Healing old emotional traumas requires very high energy in some cases, explaining why many cannot heal despite professional help.

Low Energy and Mental Health Challenges



Brittle Personality

Minor shocks cause major reactions

Emotional Withdrawal

Coping mechanism for energy conservation

Depression

Often has an overlooked energetic component

Low vitality alone might cause a brittle or unstable personality. Someone who seems stable may develop anxiety attacks or major depression from a seemingly minor shock, as they were 'running on empty.' This is increasingly common today due to low-quality foods, insufficient rest, and various internal and external stressors.

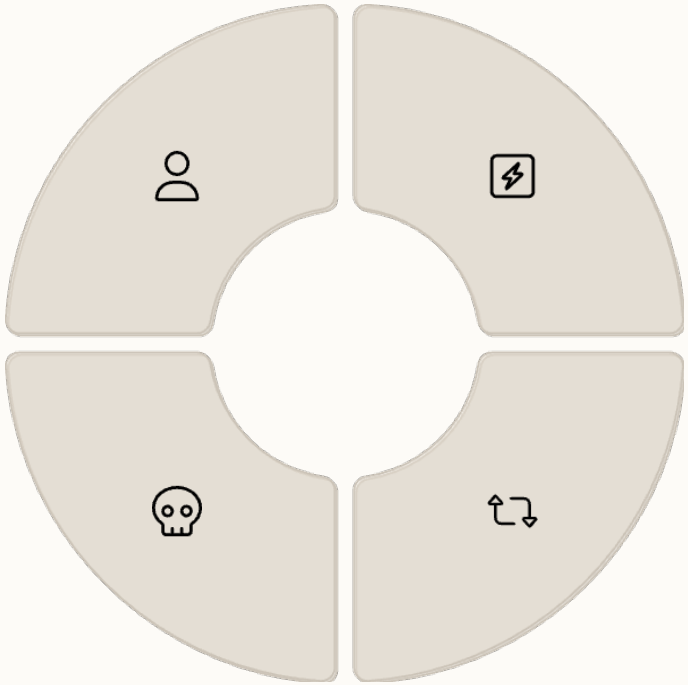
Awareness and Biochemical Factors

Mineral Deficiencies

Low zinc and selenium affect brain centers crucial for awareness

Energy Patterns

Low sodium/potassium ratio and slow oxidation reduce awareness



Toxic Metals

All toxic metals are neurotoxic and lower awareness in different ways

Resistance Patterns

Certain biochemical patterns indicate resistance to change

Awareness—how well a person is tuned into their immediate environment—is affected by numerous biochemical factors. Reduced awareness is associated with low vitality, brain fog, distractibility, and a lack of grounding. It's a prerequisite for intelligence, certain abilities, good judgment, and wisdom.

The Impact of Toxic Metals on Mental Function

Copper

Causes spaciness or slight detachment from reality. In extreme cases, copper toxicity leads to hallucinations, delusions, and some forms of schizophrenia.

Mercury

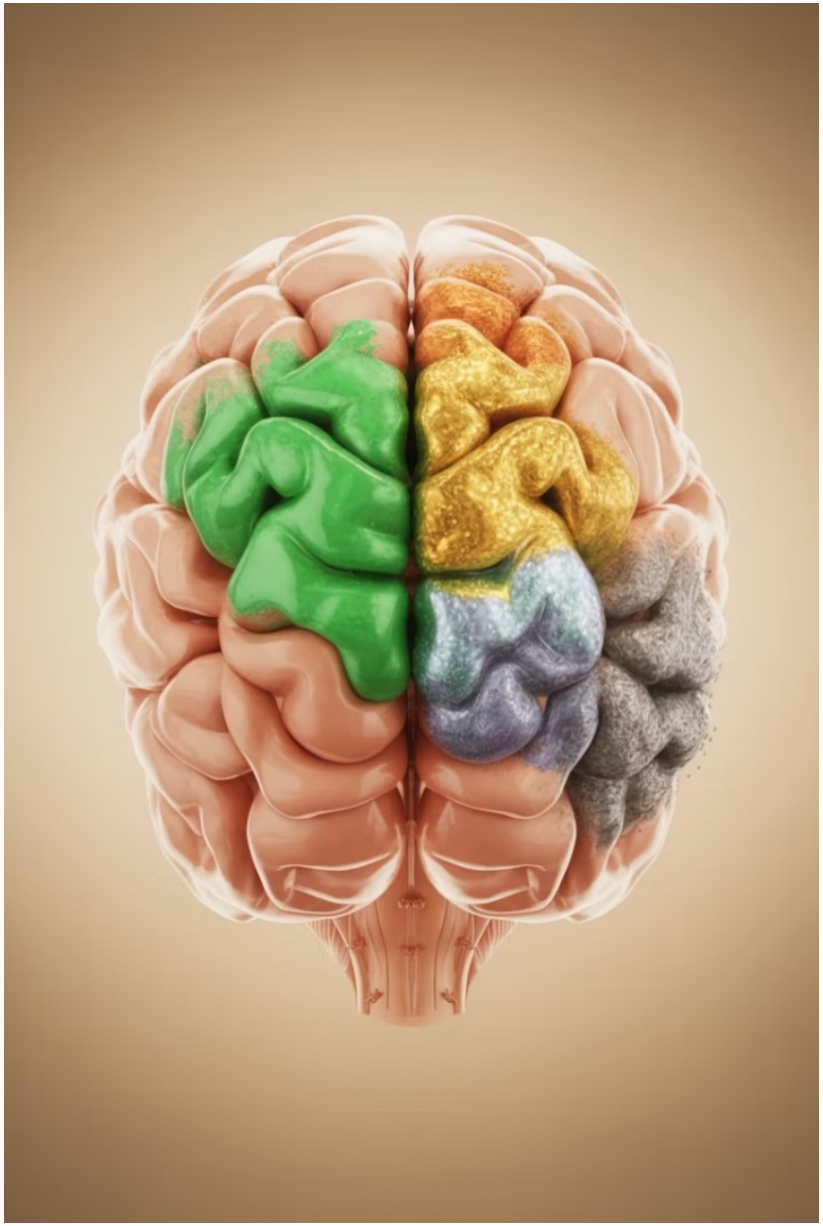
Results in odd behavior and twisted reasoning that reduces awareness. Mercury significantly impairs cognitive function and logical thinking.

Lead

Dulls perception and understanding, associated with reduced IQ. Lead poisoning has profound effects on cognitive development, especially in children.

Aluminum

Dulls awareness in ways that affect memory more than other areas of the mind, contributing to cognitive decline and memory disorders.



The Healing Protocol

Diet Modification

Personalized nutrition based on metabolic type

Targeted Supplementation

Specific minerals and vitamins for rebalancing

Detoxification

Near infrared sauna, coffee enemas, foot baths

Lifestyle Adjustments

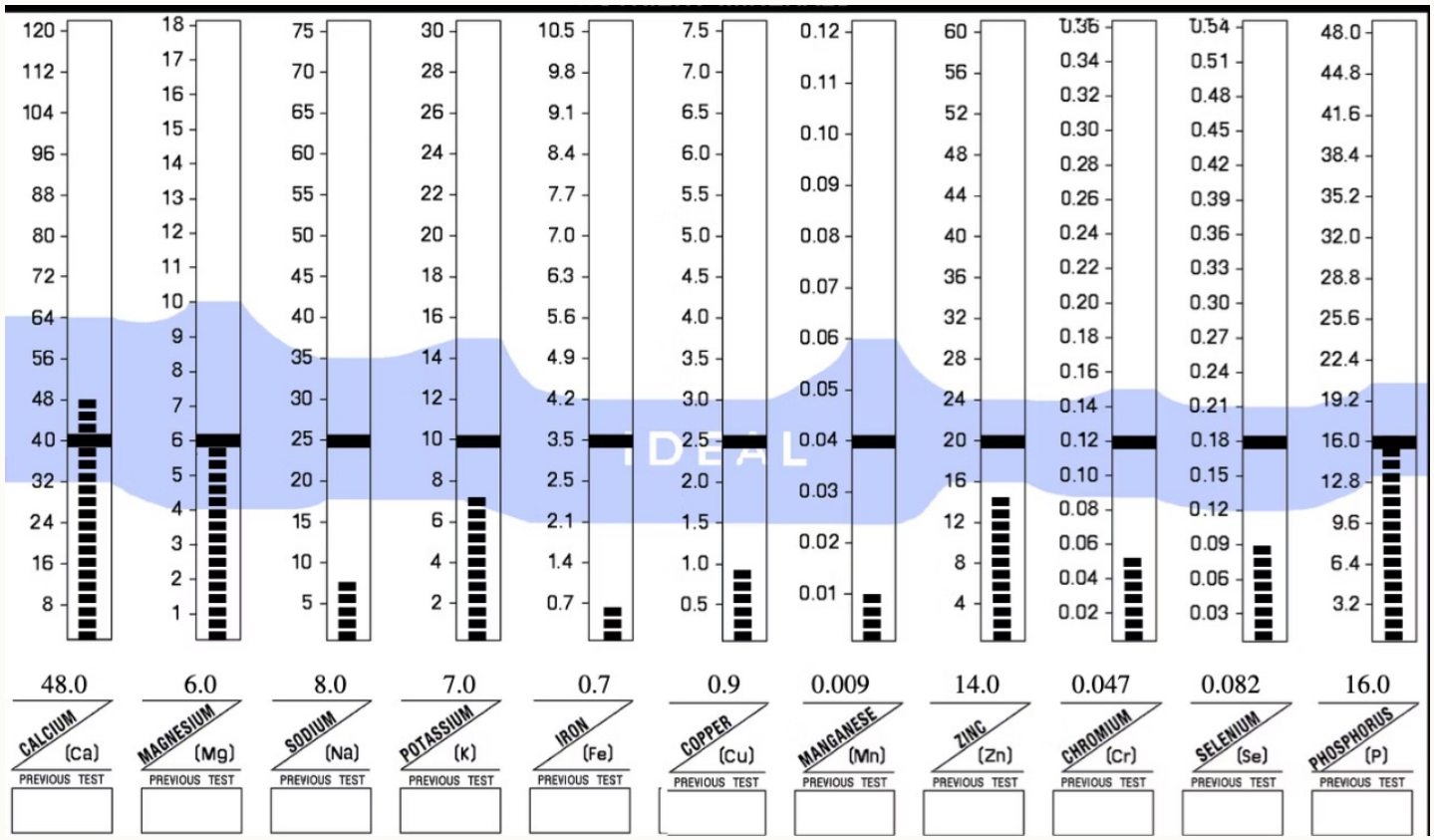
Sleep, stress management, exercise recommendations

How the program works

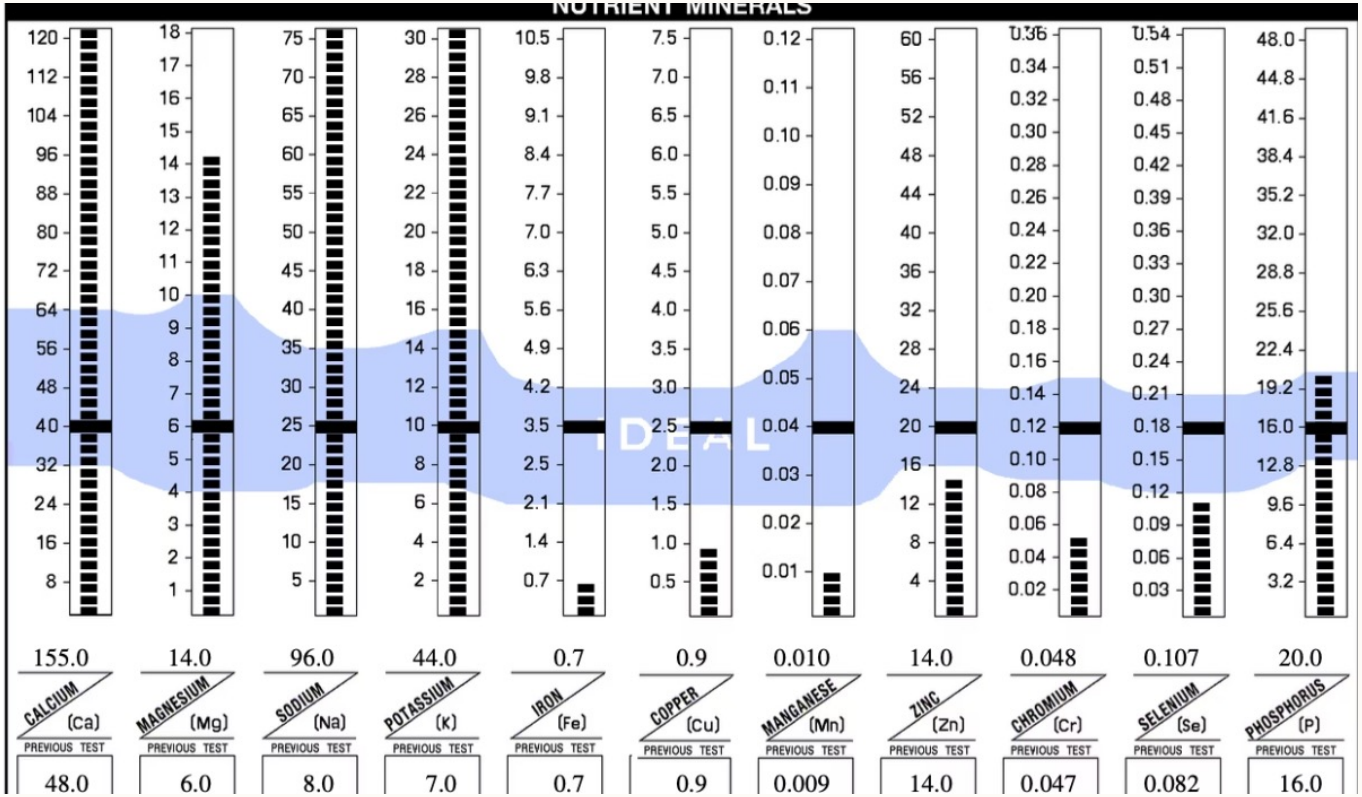
- It is like a ping pong game…you will eventually enter many or all of the patterns and oxidation rates if you do it long enough.
- It goes like this:
  - Minerals decrease and increase from test to test in response to stress and eliminations
  - Eliminations will cause changes in the minerals, sometimes that means minerals increase as the stress increases on the body in response to eliminations. However, sometimes that could mean a decrease b/c the body is utilizing available minerals for the eliminations. It will also depend on WHAT heavy metal is being eliminated and therefore the pathway (ie kidneys vs liver) that is being utilized as to what minerals change in response to that elimination.

  - Sometimes the body prefers to re-mineralize and sometimes it prefers to eliminate.
  - (see next slide for example)

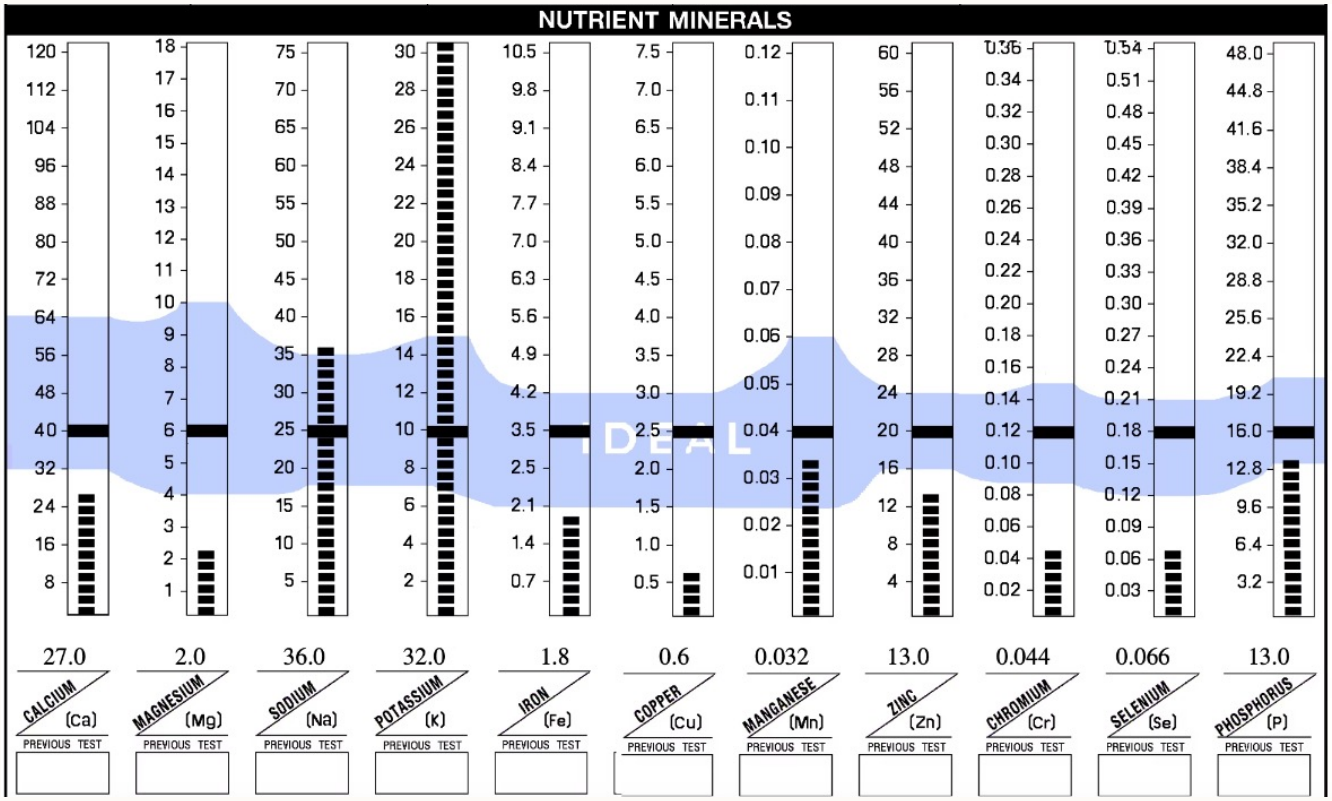
First test


IDEAL
48.0
CALCIUM (Ca)
PREVIOUS TEST
6.0
MAGNESIUM (Mg)
PREVIOUS TEST
8.0
SODIUM (Na)
PREVIOUS TEST
7.0
POTASSIUM (K)
PREVIOUS TEST
0.7
IRON (Fe)
PREVIOUS TEST
0.9
COPPER (Cu)
PREVIOUS TEST
0.009
MANGANESE (Mn)
PREVIOUS TEST
14.0
ZINC (Zn)
PREVIOUS TEST
0.047
CHROMIUM (Cr)
PREVIOUS TEST
0.082
SELENIUM (Se)
PREVIOUS TEST
16.0
PHOSPHORUS (P)
PREVIOUS TEST

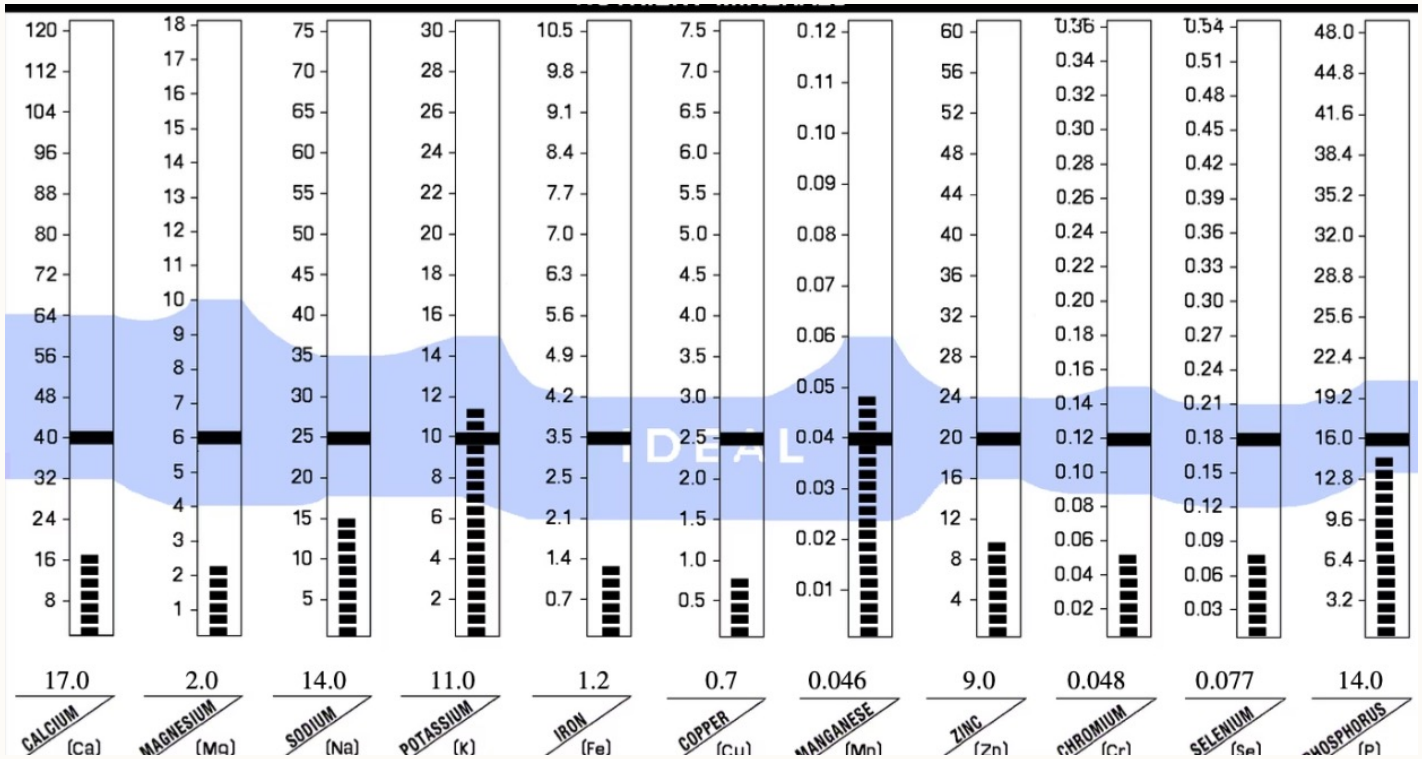
First retest



First test


NUTRIENT MINERALS
IDEAL
27.0
CALCIUM (Ca)
2.0
MAGNESIUM (Mg)
36.0
SODIUM (Na)
32.0
POTASSIUM (K)
1.8
IRON (Fe)
0.6
COPPER (Cu)
0.032
MANGANESE (Mn)
13.0
ZINC (Zn)
0.044
CHROMIUM (Cr)
0.066
SELENIUM (Se)
13.0
PHOSPHORUS (P)
PREVIOUS TEST

Retest- minerals lowered after elimination



Retracing

- Once the body becomes stronger, you will begin to retrace old infections. So, sometimes the healing reactions are heavy metals being eliminated but sometimes, it is the body fighting an old infection that has been latent.
- When the body has more energy, it literally starts functioning better and functioning better means cleaning house!

Diet

- 6-9 cups veggies daily- ideally steamed or pressure cooked
  - Cruciferous and allium veggies are the most important
- Adequate protein for anabolism
- Some smaller fish ie salmon, sardines, anchovies, fish eggs, caviar
- Fats or carbs depending on oxidation rate
  - Fast oxidizers needs more fats
  - Slow oxidizers need more carbs

Water

- Distilled and RO water are both dead water. I do not recommend it on a MB program. We sometimes use distilled water temporarily during detox reactions.
- Spring or carbon filtered water is preferred. Spring water should be tested for contaminants. You can look up mountain valley spring water as an example of a company who posts their analysis online. Many companies in Germany also do this.
- The only way to know what's in your water before and after a filter is to test it. My tap score if you're in the USA is the best option I know of. They test city and well water.

Navigating symptoms

- This will depend on how well you are following the program.
- You generally have a few options if you were stable on a protocol and then started having symptoms
  - 1. Push through if it's not that bad
  - 2. Increase drainage ie coffee enemas or sauna or both
  - 3. Reduce supplementation to once daily
  - 4. Stop all supplements for a few days. You can keep GB3 and Paramin if you want.
  - 5. Drink distilled water only for a day or a few days and then go back to spring.
  - 6. Last option: take a binder, preferably Pectaclear by Econugenics since it is mineral rich and does not bind to any minerals in the body

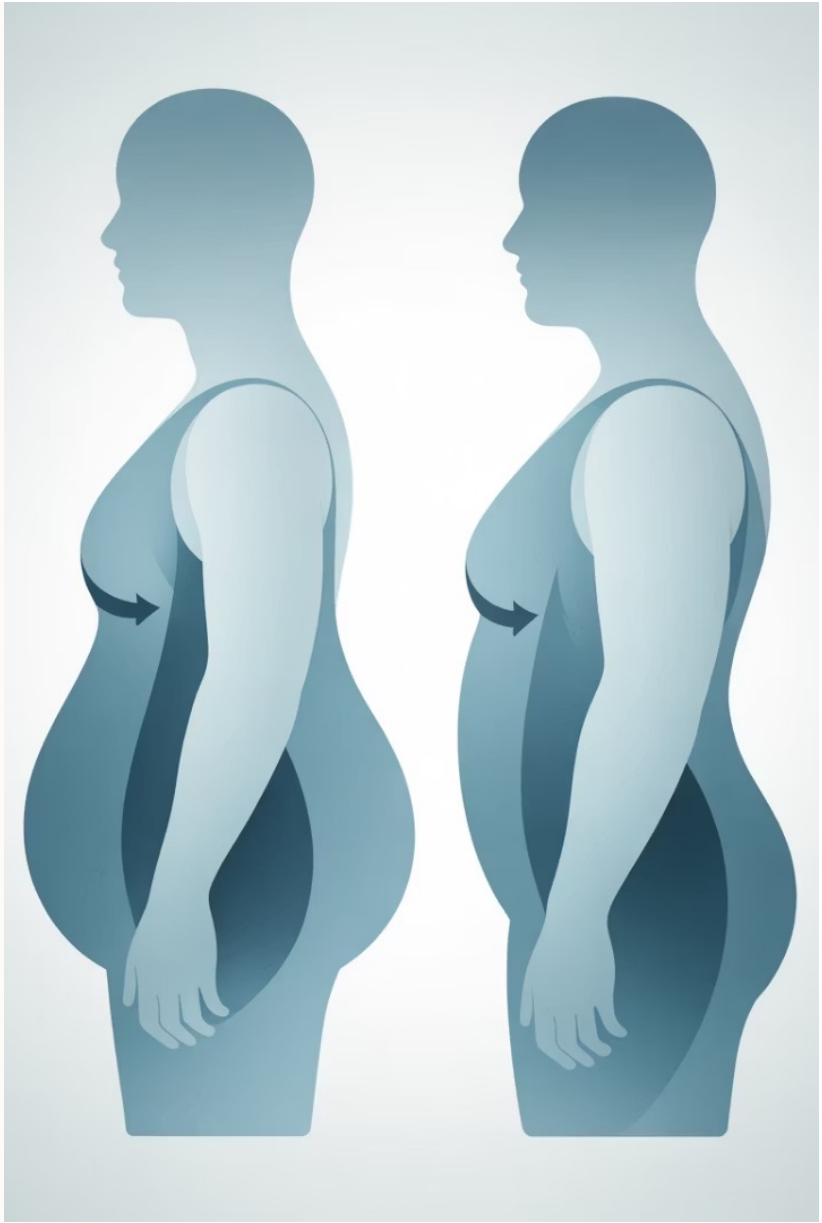
Weight Loss and Gain

- Weight certainly fluctuates on this protocol. On some retests, you will see your thyroid speed up and some you will see it slow down. This is normal as the body starts eliminating and processing heavy metals and other infections.
- The best thing you can do is relax into the ups and downs a bit. Some of it will be lymphatic back up or water weight too.
- Make sure you are eating sufficient calories and protein (that is KEY). Without those, the body becomes catabolic and will start stalling the heavy metal elimination process in favor of maintaining energy balance.

Weight Gain Patterns in Oxidation Types

Slow oxidizers tend to gain weight in a pear shape. Fast oxidizers often gain weight in an apple shape around the belly and upper body.

Both types can gain weight due to nutrient deficiencies, food sensitivities, and metabolic imbalances. Weight loss is possible through rebalancing body chemistry.



Causes of Weight Gain by Oxidation Type

Slow Oxidizers

- Fatigue and depression
- Hypoglycemia tendencies
- Low digestive enzymes
- Insulin excess
- Inflammation

Fast Oxidizers

- High cortisol levels
- Metabolic Syndrome
- Higher insulin levels
- Water retention
- Carbohydrate sensitivity

Fast oxidizers benefit from lower-carb diets with quality fats. Slow oxidizers should reduce grains and fruits. Both types should focus on vegetables and quality proteins.

retesting

- Make sure you are cutting the ½ to ¾ inch of hair for retesting...if you can find the same spot and cut there again, that is even more ideal since we know it's all new hair. You have to be more accurate with retesting than you do a first test in terms of the length of hair.
- Make sure you are not using a salt water softener or head and shoulders type shampoos with zinc
- Wash your hair and then wait 4-24 hours before collecting
- Mail in the same forms and be sure to put your lab number on the order form when you mail it in so that they can put your old values on your new test.
- Continue MB until you get your retest results back!

Detoxification Methods

Near Infrared Sauna

Powerful therapy that reduces toxic metals, chemicals, and infections while improving circulation and oxygenation.

Coffee Enemas

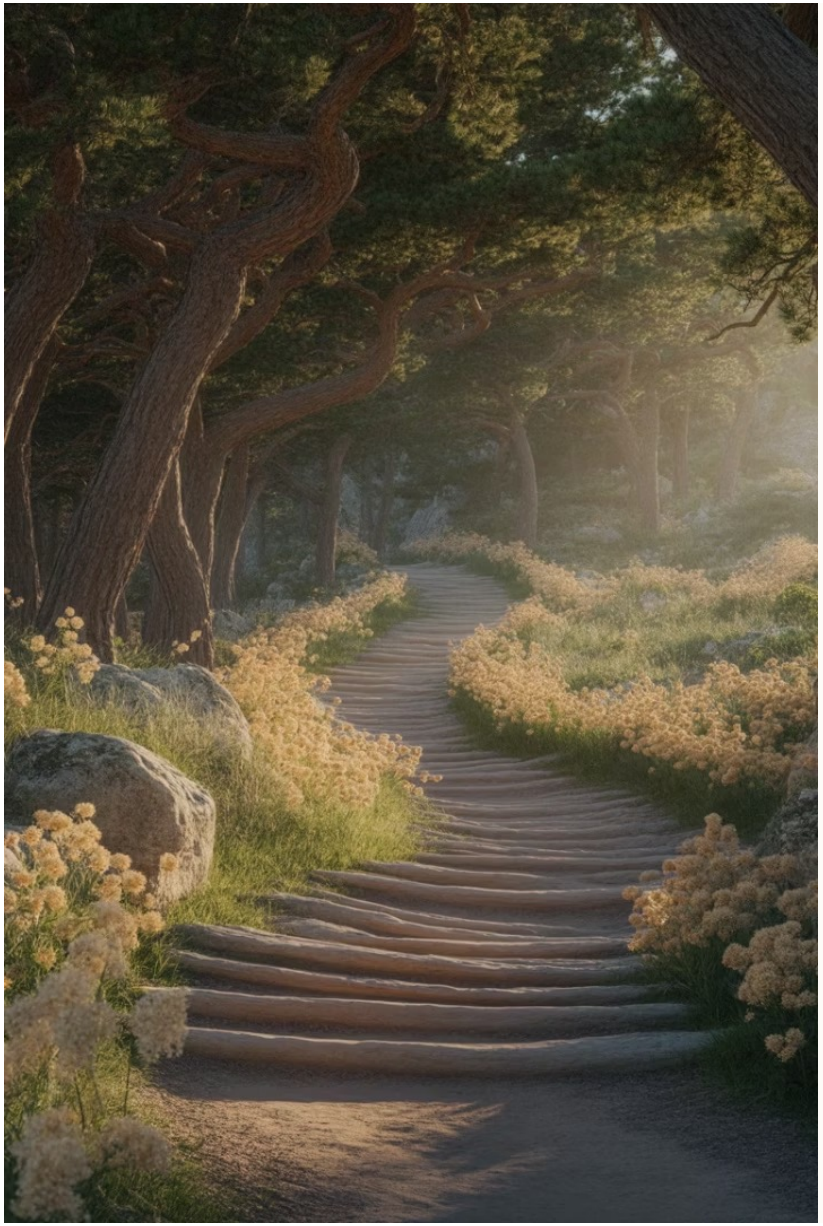
Deep cleansing of the liver and large intestine to enhance detoxification pathways and bile flow.

Colon Hydrotherapy

Assists in removing accumulated waste and toxins from the intestinal tract.

Gentle Replacement

Replacing less preferred minerals with more preferred ones in enzyme binding sites.



The Healing Journey

The Retracing Concept

How the body relives old physical and emotional problems as it begins to balance itself. This healing process may temporarily bring up past symptoms as the body eliminates stored toxins.

Managing Healing Reactions

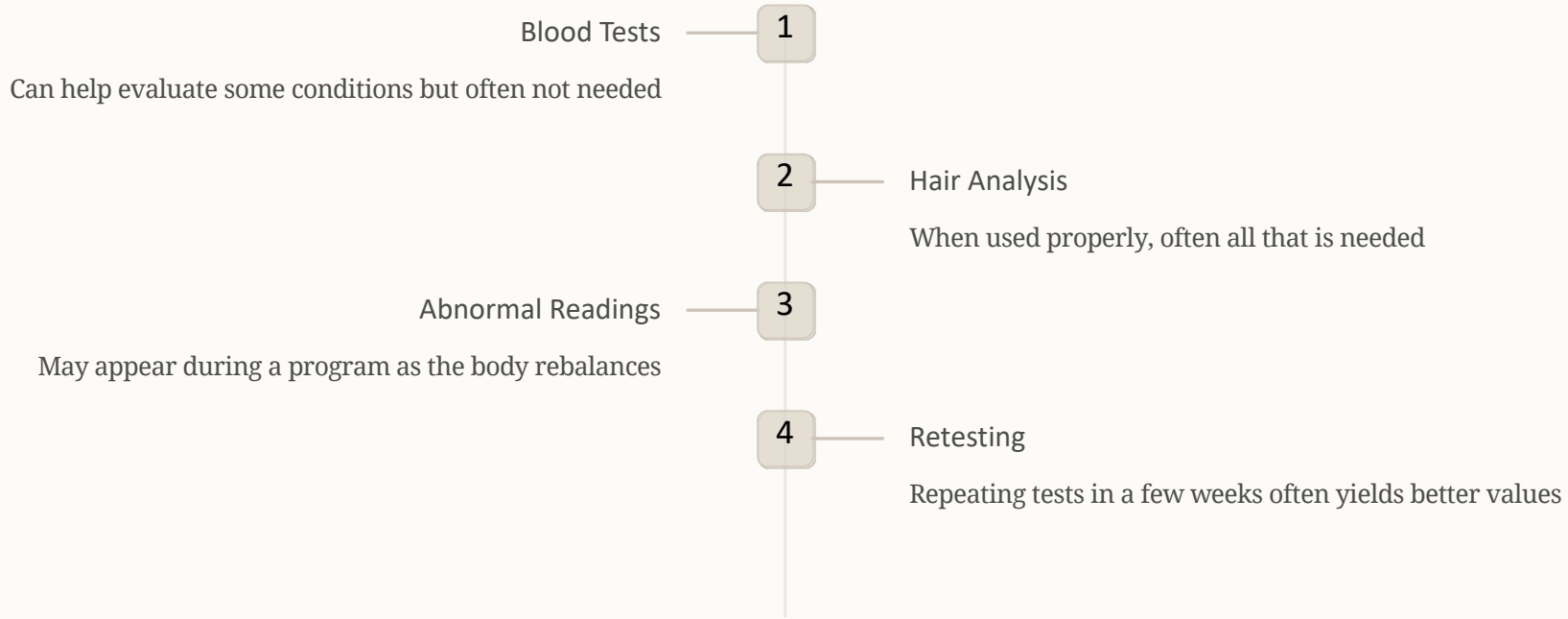
What to do if you experience problems while on the program. Understanding that temporary discomfort often signals progress in the healing journey.

"Band-aids"

The use of other supplements and supports during the process to aid in the comfort of the client and the lowering of intense symptoms.

The path to restored energy isn't always linear. As your body rebalances, you may experience temporary setbacks that are actually signs of deeper healing. Understanding this process helps you persist through challenges toward lasting improvement.

Other Diagnostic Test Data



Blood tests and other diagnostic procedures can help evaluate some conditions and are occasionally needed. In most cases, however, Dr. Eck and the author found that other testing is not needed. This puzzles many doctors, but over the years, they found that the hair test, when used properly, is often all that is needed.

Blood or other tests may reveal abnormal readings during a nutritional balancing program as the body moves back toward a healthier stress response. When this occurs, practitioners should ask whether the client is following the program completely and how they are actually feeling. If they are following the program and doing well, the test result is often temporary and not important.

Designing the Corrective Program

Analyze Mineral Patterns

Interpret key minerals and their ratios to understand metabolic type and imbalances

Identify Core Issues

Determine the dominant factors affecting the client's health

Create Personalized Protocol

Design specific dietary, supplement, and lifestyle recommendations

Monitor Progress

Regular retesting to adjust the program as mineral patterns shift

The final step in hair analysis interpretation is designing the corrective program. This complex topic requires understanding how to balance oxidation rates, improve major mineral ratios, and address toxic metal elimination in a systematic way.

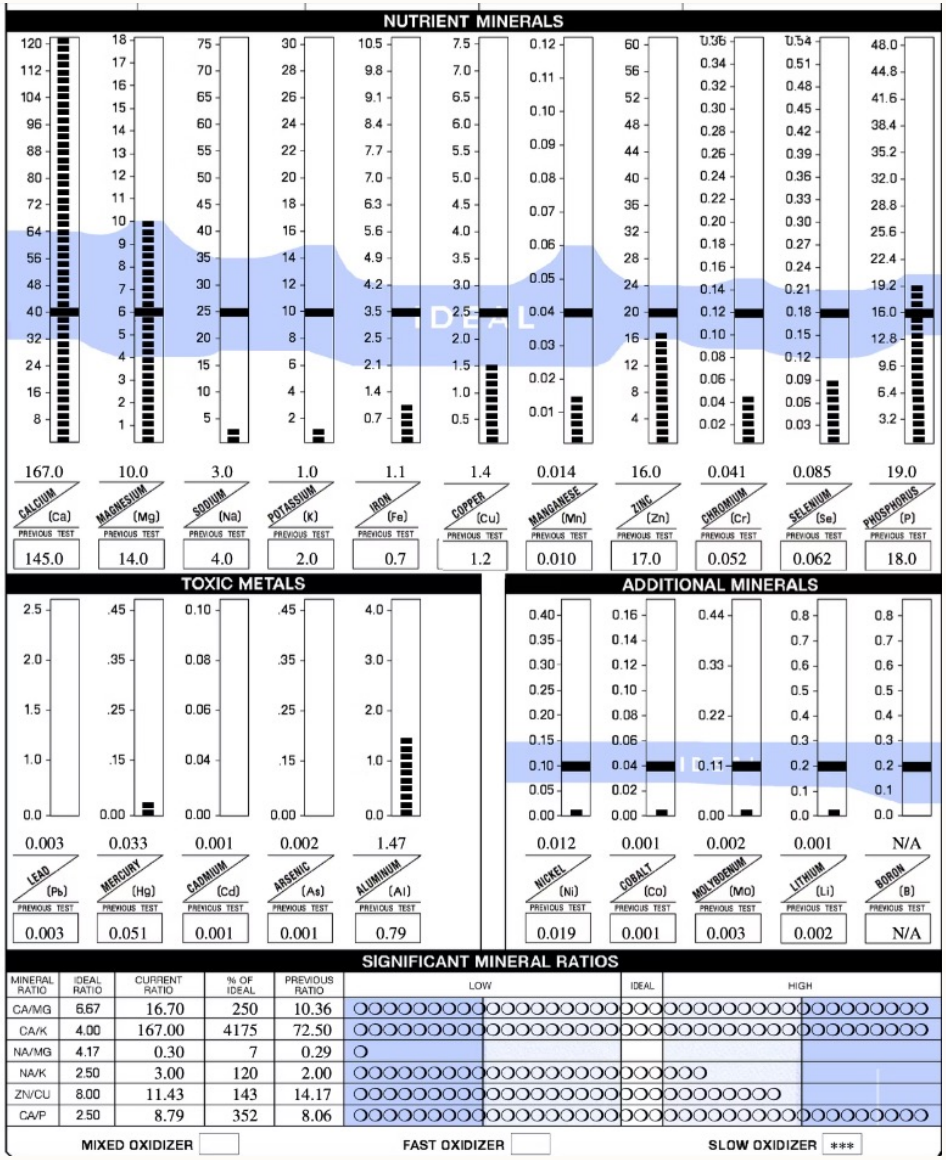
Effective nutritional balancing programs are highly individualized based on the client's unique mineral patterns, lifestyle factors, and core issues. Programs typically include specific dietary recommendations, targeted supplementation, detoxification protocols, and lifestyle modifications to support the body's natural healing processes.

What about chelation?

- Many people often ask me if they can just chelate to move faster through healing. The answer is a resounding no in almost all circumstances minus acute exposure.
- Why? Think about what is happening when you chelate...you are ripping the metals out of their place in the cell without anything else to take its place. The body needs some sort of metal/mineral for survival of the cell. Many many people have gotten worse during the chelation process.
- You are eliminating metals on the bodies time clock, meaning the body will release metals when it is ready, there is no forcing.
- Mineral balancing is a much safer way and has the benefit of being able to be done while breastfeeding and pregnant.

Mb during pregnancy and lactation

- MB is safe for pregnancy and lactation. MB does not work the same way that chelation therapy does.
- Pregnant women need more vitamins and minerals than a non pregnant woman. By intaking sufficient amounts of vitamins and minerals, you are preventing transmission of metals to the baby and improving babies mineral stores. If the body isn't properly nourished, the baby will absorb more metals to compensate for the lack of minerals.
- Most detox during pregnancy is delayed until later anyway in deference to nourishment and developing the fetus.
- The body is wise and decides what to do with the nutrients unlike chelation which chelates out minerals AND metals at the same time and therefore is forcing the body to do something it is not ready for.
- The same is true for lactation. Small amounts of toxins are passed through breastmilk, but the increase in mineral stores are also protective by preventing the body from uptaking those toxins.
- So, moral of the story is that if you are mineral balancing and become pregnant, you can continue mineral balancing without issue. You can also mineral balance during breastfeeding without issue.


NUTRIENT MINERALS
IDEAL
CALCIUM (Ca) 167.0 PREVIOUS TEST 145.0
MAGNESIUM (Mg) 10.0 PREVIOUS TEST 14.0
SODIUM (Na) 3.0 PREVIOUS TEST 4.0
POTASSIUM (K) 1.0 PREVIOUS TEST 2.0
IRON (Fe) 1.1 PREVIOUS TEST 0.7
COPPER (Cu) 1.4 PREVIOUS TEST 1.2
MANGANESE (Mn) 0.014 PREVIOUS TEST 0.010
ZINC (Zn) 16.0 PREVIOUS TEST 17.0
CHROMIUM (Cr) 0.041 PREVIOUS TEST 0.052
SELENIUM (Se) 0.085 PREVIOUS TEST 0.062
PHOSPHORUS (P) 19.0 PREVIOUS TEST 18.0
TOXIC METALS
LEAD (Pb) 0.003 PREVIOUS TEST 0.003
MERCURY (Hg) 0.033 PREVIOUS TEST 0.051
CADMIUM (Cd) 0.001 PREVIOUS TEST 0.001
ARSENIC (As) 0.002 PREVIOUS TEST 0.001
ALUMINUM (Al) 1.47 PREVIOUS TEST 0.79
ADDITIONAL MINERALS
NICKEL (Ni) 0.012 PREVIOUS TEST 0.019
COBALT (Co) 0.001 PREVIOUS TEST 0.001
MOLYBDENUM (Mo) 0.002 PREVIOUS TEST 0.003
LITHIUM (Li) 0.001 PREVIOUS TEST 0.002
BORON (B) N/A PREVIOUS TEST N/A
SIGNIFICANT MINERAL RATIOS
MINERAL RATIO | IDEAL RATIO | CURRENT RATIO | % OF IDEAL | PREVIOUS RATIO | LOW | IDEAL | HIGH
CA/MG | 6.67 | 16.70 | 250 | 10.36
CA/K | 4.00 | 167.00 | 4175 | 72.50
NA/MG | 4.17 | 0.30 | 7 | 0.29
NA/K | 2.50 | 3.00 | 120 | 2.00
ZN/CU | 8.00 | 11.43 | 143 | 14.17
CA/P | 2.50 | 8.79 | 352 | 8.06
MIXED OXIDIZER
FAST OXIDIZER
SLOW OXIDIZER ***

Getting Started with HTMA

Sample Collection

Cut small hair sample from the nape of neck. Only 1-2 tablespoons needed for analysis.

Laboratory Analysis

Sample is processed using ICP-Mass Spectrometry. Results available within 2 weeks.

Personalized Protocol

Certified practitioner interprets results. Creates custom healing program based on your unique patterns.

Health can not be found in a supplement. Health is found in the foundational work that you commit to daily.

Daily effort > maximum effort

Resources

- HTMA Success Course with Susan Cachay
- https://htmasuccess.com/
  - Code: PURPLE250 for $250 off!
- Clark Englebert Nutritional Analytics Course
- Development Science and Development Programs Book by Dr Lawrence Wilson
- Analytical Research Labs Newsletter
- Energy book by Dr Paul Eck
- The Mineral Fix by Dr James Dinicolantonio
- Nutrient power book by Dr William Walsh
- Trace Elements Labs newsletter
- Dr Malter and the Malter institute- https://rickmalter.com/