biocoherence

Hair Tissue Mineral Analysis

Client: Michelle Doe
Age: 45
Gender: Female
Type of hair: head

Therapist: Health Therapist
Date of analysis: 4-3-2021
Report number: # sample number

Content

***Information in this report is intended as information to the treating therapist and not primarily as an official diagnosis**. A consumer version can be made by printing chapter 0-3 for the client.*

Treatments are not aimed at depriving the client of regular care.

1 Introduction

A hair tissue mineral analysis (HTMA) is a screening test that measures the levels of twenty minerals and toxic metals present in a sample of hair. Minerals are the ‘spark plugs’ of life and play many important health related roles within the human body. Providing a ‘window into the cells’, hair makes an excellent biopsy material and reveals a clear record of mineral metabolism. Hair, like all other body tissues, contains minerals that are deposited as the hair grows. Although the hair is dead, the minerals remain as the hair continues to grow. The minerals and toxic metals are locked inside the hair during the growth stage as the body uses it for the storage and elimination of minerals.
A hair tissue mineral analysis reflects long term metabolic activity as it measures an average of mineral accumulation over a three-month period of time. This is often an advantage as the test results are not influenced by day-to-day variations in body chemistry due to stress, diet or other factors. Creating a blueprint of one’s individual biochemistry, a hair tissue mineral analysis can assist in identifying mineral patterns which may be associated with

- Stress,
- Metabolic rate,
- Glucose-insulin metabolism,
- Cell potential (cell permeability),
- Inflammation and immune health,
- Digestion and intestinal health,
- Liver and kidney stress,
- Biochemical energy production and
- Disturbances in adrenal and thyroid activity.

It thus provides essential information for a good total diagnosis and about tendencies that take place in the body that can lead to disease or already do so in the long term. The uniqueness of the HTMA is that the patterns from the analysis are correlated to various health parameters, creating an important part of a "system diagnosis".
It is important to understand that the test provides information about processes and trends towards what Prof. Antonovsky once mentioned the 'ease - disease continuum' (literally: ease - discomfort continuum), with which he wanted to indicate that there is not a black and white boundary between 'healthy' and 'sick' but a continuous line whose extremes are 'severe ill 'and' completely healthy '.
Somewhere along this line, the body crosses a boundary where disturbances also acquire a visible (= structural) character (= the specific field of activity of regular diagnostics). We then speak in a clinical sense of a "disease". If you are in front of this line, you are generally "not sick" in the eyes of conventional medicine. The hair analysis can only be properly interpreted by the professional therapist in relation to a complete medical history and additional laboratory or regular clinical examination where necessary.
In addition to the mineral status of the body, the report mainly provides a summary of the state of the regulatory systems, i.e. the autonomic nervous system, the glucose-insulin metabolism and the hormones (especially the adrenal glands and thyroid) and the intestinal metabolism.
An abnormal function (for example of the adrenal glands) has only three variants, it is normal, too fast or too slow. In our modern times, many complaints and disorders are stress-related, but it should be noted that stress has a much broader meaning than that which is usually associated with it (= psychological stress).
This also means that the description of the hair analyzes has only limited variation. Multiple reports from different people will show a great deal of similarity, as almost everyone has to deal with a disturbance in the stress system and metabolism. The effect of these disturbances on the metabolism, in terms of a disturbance of the mineral balance, is very different individually, although certain frequently occurring patterns are recognizable there too. How it manifests itself in complaints or disorders can be very different from person to person, depending on the constitution (“the dike breaks through where the weakest spots are”). The intervention is also geared to the results of the hair mineral analysis.

Important:

What can you expect from a treatment based on this (and possibly additional) research. It is important that you understand that the treatment is at no point aimed at suppressing complaints quickly and briefly. The treatment is aimed at a sustainable restoration of a healthy balance in the total body, whereby work is done on a cure of the disease or stopping the progress of destructive disease processes. This takes time. In some cases it can take more than a year to reach a stable, healthy end situation. Of course, you must be able to observe a clear improvement in complaints and condition during that period. We repeat the hair analysis every three months in order to be able to determine the progress objectively and to adjust and adjust the therapy based on the current state of affairs.

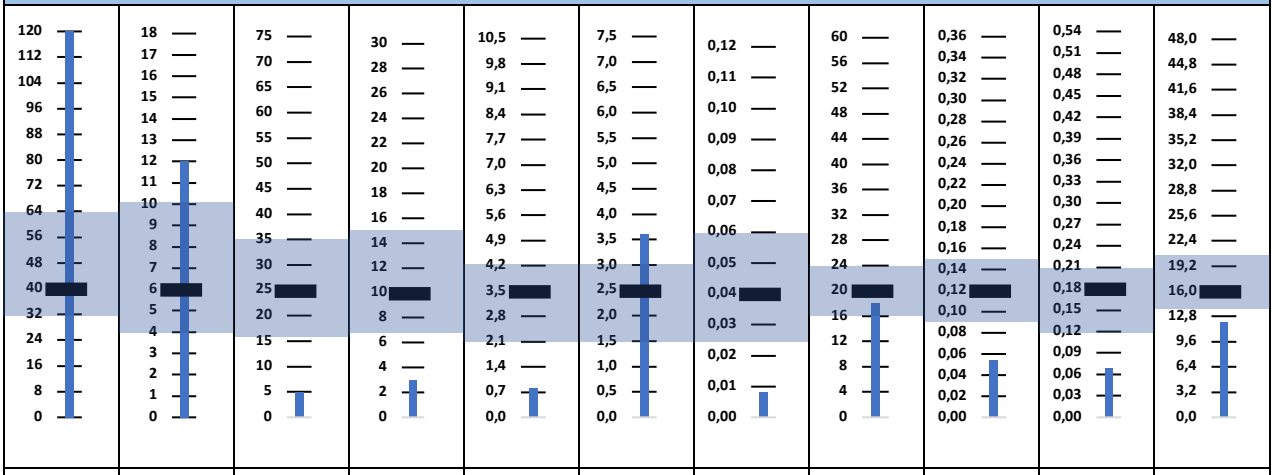
2 Laboratory Analysis

The accuracy and reliability of the test results and interpretation is based directly upon the laboratory receiving a properly collected hair sample that is clean and free from external contaminants. It is difficult for the laboratory to make a determination as to whether the sample was taken properly. Accordingly, the laboratory assumes no responsibility for results from an improperly submitted hair sample.

- Test results - The ideal values for minerals are indicated by the dark gray bands, i.e. calcium 40 mgs%, magnesium 6 mgs%, sodium 25 mgs%, potassium 10 mgs%, etc. *Your mineral values are printed directly above the name of each mineral. The black rectangle blocks represent a bar graph showing where your values lie in relation to the ideal values. Significant mineral ratios and your oxidation rate are located at the bottom of the graph.*
- Reference ranges (blue shaded area) indicated on the graph of test results represent statistical 'ideal' levels. These reference ranges should not be considered as absolute in considering mineral excesses, deficiencies or toxic levels of elements.
- The results of the hair tissue mineral analysis are reported in milligrams percent (mg%) or milligrams per 100 grams of hair.
- Test results were obtained using sophisticated ICP-MS instrumentation and procedures in a clinical laboratory environment with government regulatory standards in the USA (Dept. Of Health and Human Services, Clinical Laboratory Improvement Act) and in the Netherlands.

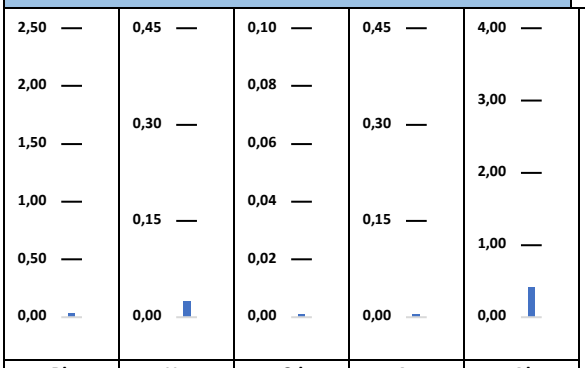
3 Results

FOOD MINERALS



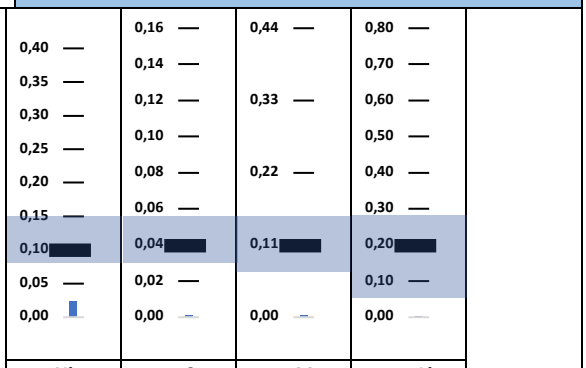
Ca	Mg	Na	K	Fe	Cu	Mn	Zn	Cr	Se	P
182,0	12,0	5,0	3,0	0,8	3,6	0,008	18	0,054	0,069	12,0
CALCIUM	MAGNESIUM	SODIUM	POTASSIUM	IRON	CUPPER	MANGANESE	ZINC	CHROMIUM	SELENIUM	PHOSPHOR

TOXIC METALS



Pb	Hg	Cd	As	Al
0,031	0,025	0,001	0,004	0,41
LEAD	MERCURY	CADMIUM	ARSENIC	ALUMINIUM

OTHER MINERALS

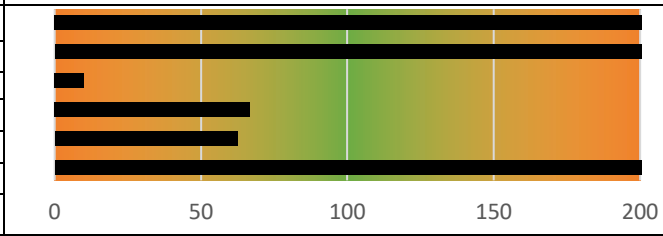


Ni	Co	Mo	Li
0,024	0,001	0,003	0,002
NICKEL	COBALT	MOLYBDENUM	LITHIUM

IMPORTANT MINERAL RATIOS

RATIO	IDEAL VALUE	MEASURED VALUE	% OPTMIAL RATIOS[a]	RECENT VALUE
Ca/Mg	6,67	15,17	227	
Ca/K	4,00	60,67	1517	
Na/Mg	4,17	0,42	10	
Na/K	2,50	1,67	67	
Zn/Cu	8,00	5,00	63	
Ca/P	2,50	15,17	607	

% RATIO VERSUS IDEAL VALUE



SPEED OF OXIDATION

Significantly slow

STRESS RESPONSE

Exhaustion phase (Phase 3)

Summary

Adrenal Glands

- Different values and ratios show an HPA-axis disregulation.
- The mineral analysis indicates a pattern of diminished cellular adrenal glandular activity.

Thyroid

- A weak HPA-axis function may contribute greatly to the accumulation of heavy metals as normal detoxification mechanisms become impaired.The mineral profile shows that your thyroid function is underperforming.

Specific personality profiles

- The BOWL PATTERN.
- STRESS FROM WITHIN AND WITHOUT.
- BURNED OUT SYMPATETIC DOMINANCE (HPA- axus disregulation).
- SEVERE LIFESTYLE OR ATTITUDE STRESS.
- SEVERE BURNOUT.
- WASTING ONE'S TIME.
- CALCIUM SHELL OR TIRED - VERY HIGH CALCIUM.
- SYMPATHETIC DOMINANCE - LOW POTASSIUM.
- TRYING TOO HARD - HIGH CALCIUM WITH LOW POTASSIUM.
- BIOUNAVAULABLE CALCIUM - HIGH CALCIUM WITH HIGH MAGNESIUM.
- SLOW IN CRUCHES.
- COPPER UNBALANCE.

Sugar and carbohydrate tolerance

- Your body indicates an imbalanced glucose (sugar) metabolism. This is visible in the high Ca/Mg ratio and the low Na/K ratio.

Protein synthesis

- Your body indicates a decreased protein synthsis at this moment. This is visible in your low Phosphor value.
- Since a low Na/K ratio reveals significant information regarding an individual's capability in utilizing protein, your low Na/K ratio is contributing to an impaired protein synthesis at this time.

Digestion

- Your body shows an impaired digestion at this time. This is visible in your low Phosphor value.Since a low Na/K ratio reveals significant information regarding an individual's capability in digesting protein, your low Na/K ratio is contributing to an impaired digestion at this time

Immune status

- The analysis indicates an impaired immune system that may limit the body’s ability to remain in a healthy state. This is caused by a low Na/K ratio,a low Zn/Cu ratio, Zinc depletion or Zinc loss a Copper unbalance,

Liver and kidney stress

- The analysis indicates a trend for liver and kidney stress. This may contribute to impaired toxic metal elimination, impaired immune system, carbohydrate intolerance, fluid imbalances and other conditions that may affect liver and kidney function.

Inflammation

- Your hair tissue mineral analysis currently indicates the presence of an inflammatory tendency as is shown in a low K value, (inadequate glucocorticoid (anti-inflammatory) activity), high Copper value, (suppression of anti-inflammatory hormones),

Cell wall permeability

- The analysis indicates significantly decreased cell permeability.

The 4 macro-minerals

- Calcium: An elevated calcium level does not automatically mean the presence of too much calcium in your diet or in the body.
- Magnesium: Your Magnesium level has increased, but it does not automatically mean that your body contains too much Magnesium.
- Sodium: Low sodium levels are often attributed to increased calcium excretion due to decreased adrenal activity.
- Potassium: Low potassium levels are often attributed to increased potassium excretion as a result of decreased adrenal activity

Nutrient mineral patterns

- Iron: In most cases, low iron does not directly mean a lack of iron, but represents the amount of unavailable iron.
- Copper: Your copper level is currently above an optimal range which indicates a copper toxicity, or an elimination of excess tissue copper.
- Manganese: A low manganese level is often associated with a manganese deficiency in the diet, especially if one consumes refined foods or white sugar.
- The zinc value is in the right range.
- Chromium: A low chromium content means a large fluctuation in blood sugar levels, a strong need for sugar or starch.
- Selenium: A low selenium level may contribute to impaired detoxification and thyroid gland activity.
- Phosphor: A low hair tissue mineral phosphorus level indicates excessive protein catabolism or tissue breakdown.

Heavy metals and toxic elements

- *Copper:* The high copper value indicates an excess of copper in the tissues or copper poisoning.
- *Aluminium*: Your hair analysis shows that Aluminum is present in the tissues at this time.

Chapter 4 Some definitions and background of the Interpretation of your test results

The interpretation of your hair tissue mineral analysis depends upon developing a 'metabolic blueprint' of how the body is responding to stress. The term 'stress' has wrongly taken on too much a negative weight in our everyday language. We often understand psychological pressure and tension. That is too limited. Stress is everything that causes a disturbance in us and therefore requires a reaction from the body and / or the psyche. More important than stress is our adaptability and the time we take to recover.
The ability to determine the stage of stress and the oxidation rate from a hair tissue mineral analysis makes it possible to assess the likelihood of many conditions and guide correction based upon your metabolic imbalances. A thorough interpretation of the tests results also requires the identification of mineral levels, ratios and metabolic patterns.

Metabolic patterns:
A metabolic pattern is a combination of mineral levels and/or mineral ratios that reveal how the body is responding to stress. Identifying metabolic patterns simplify the interpretation as the science of mineral balancing is almost always aimed at improving major metabolic patterns and not a single mineral. A general rule is that metabolic patterns are the most important factors to consider when interpreting a hair tissue mineral analysis, followed by mineral ratios and mineral levels. Ratios represent mineral relationships and balances in the body.

The influence of stress on our energy and health:
The body responds to stress by mobilizing all available energy. However, when the body is unable to produce enough energy to cope with stress, the body automatically responds to it in a general pattern consisting of 3 different stages.
We speak of the (1) Alarm phase, (2) the Adaptation or Resistance phase and (3) the Depletion phase respectively. Understanding these stages is an important tool in correcting the less healthy state with a low energy level to a healthier state with a higher energy level.

Hormone functions:
Our hormone glands work closely with the autonomic nervous system to deal with stress well. The adrenal glands and the thyroid gland have the most important role here. The adrenal glands because they produce the stress hormones and the thyroid gland because it is responsible for the energy management. That is why the report also gives explicit attention to this.

Biologically useful or not:
For a proper understanding of HMA, it is important to emphasize that we distinguish between minerals in a biologically useful or unusable form. A high score of a certain mineral in the HMA report does not always mean that there is just too much of that mineral in the body and that you should therefore take less of it. That is much more complicated.
For example, a too high calcium value in the hair indicates an excess of a biologically useless calcium and at the same time a shortage of biologically usable calcium. In that case, for example, you do indeed need extra calcium (supplement) and the body will excrete the unusable calcium in response. With this form of calcium, you can think for example of Calcium deposits in the connective tissue of the vessels (arteriosclerosis).

INTERPRETATION OF THE ANALYSIS RESULTS

5 Speed of Oxidation

The term 'oxidation rate' refers to the 'burning' of foods in the body or how the body converts the foods you eat to energy. There are three types of oxidation rates, slow oxidation, fast oxidation and mixed oxidation. There are varying degrees of each oxidation rate and ideally it would be best to have either a slightly slow or slightly fast oxidation rate.

Slow Oxidation
A slow oxidizer is an individual who metabolizes food at a rate slower than that required for the production of optimal energy levels to adequately perform basic body functions. In slow oxidation the activity of both the adrenal and thyroid glands is less than optimal. Slow oxidizers often experience some degree of fatigue, lack of energy, sugar cravings, low blood sugar levels, constipation, weight gain, dry skin and depression.

Mixed Oxidation
A mixed oxidizer is an individual who metabolizes food at a rate that fluctuates between slow and fast oxidation. There are two types of mixed oxidation - slow/mixed oxidation and fast/mixed oxidation. Mixed oxidation is normally a transitory state of oxidation and is moving toward a state of slow or fast oxidation. Mixed oxidizers often experience a combination of symptoms associated with both fast and slow oxidation.

Fast Oxidation
A fast oxidizer is an individual who metabolizes food at a rate faster than ideally required for the production of optimal energy levels to adequately perform basic body functions. Although this results in higher energy levels, the energy generated is temporary and is dissipated rather quickly. Fast oxidation is generally characterized by excessive activity of the adrenal and thyroid glands. Fast oxidizers often experience some degree of anxiety, irritability, elevated blood sugar levels, elevated blood pressure, oily skin and a tendency for frequent bowel movements.
Sympathetic dominance. A common situation found in slow oxidizers is of great importance and called sympathetic dominance. It is an imbalance of the autonomic nervous system.
In this common situation, the person is still attempting to use the sympathetic nervous system all the time. However, the body is exhausted and can no longer respond strongly. As a result, the person stays tired and often ill, because excessive sympathetic stimulation blocks or inhibits the activity of the immune system, digestive system, elimination system and other vital organs and systems needed for recovery of health.

Temporary fast oxidizers or slow oxidizers under stress
These are fast oxidizers that have other imbalances on the hair analysis graph that indicate their condition is not a true fast oxidizer state but rather a temporary one due to the presence of toxic metals or some other physical, emotional or spiritual stress condition. The analysis indicates a true fast oxidizer, in fact the person is a temporary fast oxidizer. Signs if this include the person is older than about 10 and the person has significant health problems, usually including some slow oxidizer symptoms. Symptoms of both fast and slow oxidation may be present because this a stalled transaction state between fast and slow oxidation. For example, one can be anxious at times, yet depressed and tired at other times, another combination is high blood pressure (a fast oxidizer tendency) and hypothyroidism (a slow oxidizer tendency)

- **The HTMA analysis shows that your body has a significantly slow oxidation rate.**

6 Stress

Stress is the body's response to any physical or emotional stimulus or event and can be both beneficial and harmful, depending on the type and intensity of the stressor (= stress inducing factor). The body responds to stress by mobilizing all available energy. When enough energy can be released to overcome the stress, health and well-being are restored. Crucially, we must strive for a balance in the stress response so that it works for us rather than against us. The stress physiologist Dr. Hans Selye still assumed that at some point the body can no longer respond and so he came up with his "General Adaptation Syndrome" that consisted of 3 phases when the stress lasts longer. He called these phases: the alarm phase, the adaptation or resistance phase and the exhaustion phase. However, modern insights in stress physiology have shown that it is a bit more nuanced.

Allostasis and Allostic Load
Allostasis is a name for all processes that occur for achieving a new internal equilibrium (homeostasis) through physiological or behavioral changes. This can be accomplished by altering the hormones of the HPA-axis, autonomic nervous system, cytokines, or a number of other systems. For stress, this means that stress reactions are triggered when a certain balance is disturbed to return to this balance, or to establish a new balance, in which the human being can live well and without stress.

The effort the body has to do to regain balance during stress is called allostasis load (AB). With a small stress experience, the allostasis load is small and the stress reactions are mild. If the allostasis load is high, the stress reactions are also stronger. If the allostasis load becomes too great, so that reaching homeostasis takes too much energy, takes too long, or is not possible, then stress persists for a long time, with all negative consequences for health.
It is extremely rare for one of the crucial hormones to actually run out, even during the most prolonged stress period. It's not so much the stress response that gets exhausted; but that the stress response itself, when activated sufficiently, can cause a lot of damage. When it comes down to it, an adequate stress response is still possible, but the price the body pays for it is too high. This leads to the consumption of reserves, accelerated wear, damage and disease. In the scientific literature this is called the "glucocorticoid cascade hypothesis". In addition to an "overdrive state", however, an "underdrive state" of the stress system can also arise. This effect is just as debilitating as an "overdrive".

Prof. Bruce McEwen, a prominent stress scientist, has illustrated Allostasis Tax using "the metaphor of the salmon". In the spring, the salmon migrate to the water where it once hatched to produce offspring there. Because this is usually upstream where waterfalls and rapids have to be taken, this is an enormous physical achievement. After mating, the salmon dies. McEwen emphasizes that the salmon dies from long-term overproduction of stress hormones and the damage that this has done to the body. The great thing about this metaphor is that you can see that a high level of performance and even a high subjective experience of energy and vitality does not necessarily equate to good recovery and good health.

The 3 phases of stress response:

Alarm Stage (phase 1): The alarm stage of stress is considered an early stage of stress in which the body has adequate energy to fight back against the stress. It is often associated with activation of the sympathetic nervous system, a fast oxidation rate, higher blood pressure and blood sugar, higher body temperature and more frequent bowel movements. The body reacts to acute stress by releasing hormones produced by the adrenal glands which mobilize the body’s energy to meet and overcome the stress.

Resistance Stage (phase 2): The resistance stage of stress occurs as the body attempts to adapt to the stress when it can no longer maintain an alarm stage. This stage of stress is best described as an endless battle, with the body attempting to contain the stress as it's unable to eliminate it. The resistance stage of adaptation can go on for a long period of time in an effort to limit or minimize the stress. The body still has some energy reserves available to resist stress, though less than in the alarm stage. Crucial in this phase is the question of whether there are sufficient recovery times and recovery quality. If that is the case, the balance can be kept for a long time.

Exhaustion phase (phase 3): This phase can best be compared to an overcompensation for stress by the body. So there does not have to be any feeling of fatigue or even exhaustion. Cortisol production can also be good, for example. This is because cortisol production is primarily controlled by the brain, central nervous system and tissue-specific regulatory mechanisms. Burnout is therefore primarily an HPA-axis disregulation. In this phase, however, there is structurally insufficient recovery, the balance in the stress response has been lost and the body consumes its reserves. A foundation is laid for accelerated aging and the development of chronic diseases. Over time, symptoms may include fatigue, depression, apathy, feelings of despair, constipation, dry skin and hair, and an often under-functioning thyroid gland.

- **The HTMA analysis shows that the stress system of your body is currently in the Exhaustion Phase (phase 3).**

7 Energy production and hormone glands

The adrenal glands and thyroid are the body's main energy-regulating glands. They work closely together to convert glucose into energy. These two glands must function at an optimal level in order to deliver maximum energy production. Together they determine the level of the oxidation rate, or the burning rate of the body. In addition, the adrenal glands are also responsible for the release of extra energy when needed (stress). In an alarm situation, the adrenal hormones cause a sudden increase in energy (to be able to deal with the threat). Furthermore, the adrenal glands play an important role in maintaining correct blood pressure, correct blood glucose level, counteracting inflammation, correct carbohydrate metabolism and activating the body in situations of stress. Also, the adrenal glands are the only source of female hormones after menopause (natural or artificial).
The analysis can demonstrate this overload through different profiles:

1. Low Na and / or low K value
2. Double low ratio patterns
3. Low Na/K ratio
4. All 4 Low pattern
5. Low oxidation rate
6. All 4 High pattern
7. Very high Ca value
8. Step Up or Step down pattern
9. Low Phosphor value

- Your values and ratios show an HPA-axis disregulation (adrenal burn out).The mineral analysis indicates a pattern of **diminished cellular adrenal glandular activity**. This may be due to chronic stress, toxic metals, nutrient deficiencies, fear or other stress related factors. Diminished adrenal gland activity may contribute to symptoms of fatigue, exhaustion, depression, mood swings and PMS or menopausal symptoms in women.

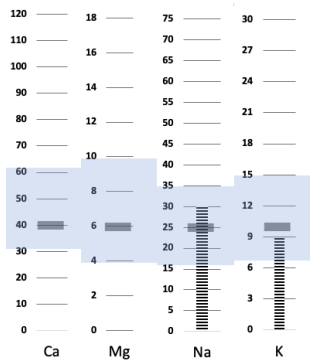
A weak HPA-axis function may also contribute greatly to the accumulation of heavy metals as normal detoxification mechanisms become impaired. The body may compensate for adrenal weakness by retaining excessive amounts of copper, iron, manganese, aluminum, chromium, lead, cadmium, arsenic and other toxic metals.

- The mineral profile shows that your thyroid function is underperforming. This may possibly contribute to fatigue, weight gain, dry skin, brittle hair, depression, a tendency for infections, low body temperature, low blood pressure and low blood sugar. Common causes of thyroid activity outside the optimal range include the presence of mercury, copper and chlorine toxicity, impaired adrenal activity, nutrient deficiencies and chronic stress.

8 Special Metabolic Patterns

8.1 The 4 most important ratios

A. THE SODIUM / POTASSIUM RATIO, OR VITALITY RATIO.



- An ideal ratio is about 2.2-2.7. A good range is between **about 2 and about 5 or 6. Your value is: 1,67**
- An important indicator of vitality. Dr. Eck called it the vitality ratio. A ratio less than about 2 indicates decreased vitality, and vitality is lower if the ratio is lower. A ratio above about 15 can also indicate reduced vitality, although not as bad as a low ratio.
- Very close relationship with the sodium-potassium pump mechanism and the electrical potential of the cells regulated by these values.
- Sodium is normally present extracellularly, while Potassium is normally present intracellularly. When the ratio between these 2 minerals is out of balance, this means that there are major physiological problems in the cells.
- This ratio is linked to adrenal function and the balance between aldosterone (mineral corticoid) and cortisone (glucocorticoid) secretion.
- A low Na / K ratio (between 1.0 and 2.5) indicates a trend for kidney, liver dysfunction, allergies, arthritis, adrenal glands, digestive problems or a lack of stomach acid.

Interpretation and symptoms:

- *Vitality indicator.* A major vitality indicator. Dr. Eck called it the vitality ratio. A ratio less than about 2 indicates lowered vitality, and vitality is lower if the ratio is lower than this. A ratio above about 15 may also indicate reduced vitality, though not as bad as a low ratio.
- *Causes for imbalance*. This is the first ratio to react to stressors of every kind. This can be physical, nutritional, emotional, mental or other.
- *Sympathetic/parasympathetic balance* in the body. A higher ratio indicates a more sympathetic state, while a low ratio indicates a more parasympathetic or burnout state.
- *A secondary sympathetic dominance indicator.* A ratio above 6 is a secondary indicator for sympathetic dominance pattern. This is a mental tendency to push oneself hard.
- *Directional indicator* regarding change in the oxidation rate. Like a turn signal light on a car, a high ratio tends to indicate a person is moving toward a faster oxidation rate. A ratio below 2.5 indicates a tendency toward a slower oxidation rate.
- *Inflammatory versus anti-inflammatory states*. A high ratio is a tendency for more pain and inflammation. A low ratio indicates less ability to mount an inflammatory response. Carbohydrate

tolerance. A low ratio is a marker for impaired carbohydrate tolerance that is not primarily or only diet-related, but instead a metabolic imbalance.

- *Charging or discharging state*. A ratio between about 2.5 and 6 indicates a 'charging state' in which the cells are more electrically charged. A low ratio, and possibly a very high ratio, indicates 'discharging' electrically, perhaps with a lower cell membrane potential.
- *Types of stress.* A high ratio is associated with more acute stress, anger or fright. A low ratio is associated with more chronic stress conditions such as long-term fears, chronic infections, chronic degenerative diseases such as diabetes, cancer, heart disease, kidney or liver diseases, and simmering or hidden negative emotions.
- *Estrogen/progesterone balance* to some degree. Sodium is more associated with estrogen. Potassium is more associated with progesterone. Thus, a higher ratio can indicate estrogen dominance. However, most women are estrogen dominant regardless of the ratio. Some doctors use the zinc/copper ratio to assess hormone balance, but I don't find this too accurate. Zinc/copper balance to a degree. Zinc raises potassium and lowers sodium. Copper raises sodium and lowers potassium.
- *Dosing zinc and copper*. Dr. Eck used this ratio to decide how much zinc and copper a person needs. This is related, in part, to stress theory. A high sodium/potassium ratio is a need for more zinc relative to copper. A low sodium/potassium ratio requires some copper and less zinc because zinc tends to lower the sodium/potassium ratio.
- *Hidden copper indicators*. In both fast and slow oxidizers, a low sodium/potassium ratio is a prime indicator for hidden copper toxicity, bio unavailable copper and a need for copper supplementation, according to Dr. Eck's research.
- *Immune response*. A low, or a very high ratio may indicate an impaired immune response. Tissue catabolism or excessive protein breakdown. A low ratio, and possibly a very high ratio, indicates excessive tissue catabolism or breakdown, or impaired protein synthesis. In other words, the body is breaking down tissue faster than it is rebuilding it. This can lead to any health condition imaginable, depending on where the tissue is being lost.
- *Cannibalism*. A low ratio may indicate the body is beginning to digest its own tissues because it cannot metabolize proteins, carbohydrates and fats correctly. The body begins to consume its own tissues for energy.
- *A digestive indicator*. Dr. Eck found that a high ratio is often associated with more hydrochloric acid in the stomach and perhaps an over-acid condition of the stomach. This may have to do with the conversion of salt to hydrochloric acid. A low ratio often indicates reduced digestive enzymes, particularly low hydrochloric acid in the stomach.
- *Copper personality types*. A high ratio is associated with a more angry, aggressive personality style, generally. A low ratio is associated with feelings of frustration, resentment, hostility, lower energy levels and often depression.
- *Introversion and extroversion*. A high ratio is associated with extroversion. A low ratio is more associated with
- *An awareness indicator*. A low ratio, especially when the ratio is less than 1, is associated with reduced awareness. In these cases, a person is often unaware of hidden traumas or perhaps beliefs and motives that are driving him.
- *Babies* often tolerate a very low sodium/potassium ratio. The low ratio often signifies chronic stress, improper diet, infections, metal toxicity.
- *Signs and symptoms*. Those associated with a high Na/K ratio include pain, edema, hypertension, swelling, irritable bowel syndrome and all 'itis' conditions. Those associated with a low Na/K ratio include allergies, exhaustion, depression, chronic infections, cancer, diabetes, and liver, kidney, digestive and heart disease. Others are negative emotions.
- R*etracing*. On retests, the sodium/potassium ratio may decrease if the body eliminates toxic metals, or the 'amigos' (manganese, iron, aluminum, chromium and selenium). This is just

uncovering a hidden low sodium/potassium ratio that was obscured on previous tests and is not a cause for concern. Old infections may flare up as this occurs.

- *Type of movement*. Force, speed and direction indicator. A high sodium/potassium ratio is forward-moving, speeding up, and becoming more effective. A low ratio is reversed. This means a person is slowing down, becoming less effective and starting to collapse into four lows. It can signal a resistance to change or stalled transition of some kind.

Reversed low (inverse) Na/K ratio

A reversal of the sodium / potassium ratio is the second most important imbalance in the mineral analysis based on the hair. This is an indication of reduced vitality and a decrease in the electrical balance in the cells. Sodium is an extracellular (mainly present outside the cells) element while potassium should mainly occur in the cells. A decrease in this ratio is an indication of a loss of potassium that damages the cells.

This low ratio is often associated with a disregulation of the HPA-axis (adrenal glands), infections and a decrease in sugar and carbohydrate metabolism. The body is no longer able to properly burn glucose to produce energy and therefore it starts to break down the body's own proteins. This is not only an inefficient way of energy production, but it also contributes to all kinds of harmful processes in the body. Tissue breakdown or catabolism is a common phenomenon in individuals with a low Na / K ratio. A low Na / K ratio often results in an inability to properly digest and use the foods consumed, causing the body to break down storage tissues (protein) in an attempt to maintain adequate energy levels and balance the metabolic process (homeostasis).). In other words, body proteins are broken down into amino acids for conversion into sugars to produce energy. Improving your ability to properly process sugars and simple carbohydrates would be the most beneficial by reducing protein catabolism. The pattern is also associated with liver and kidney stress, allergies and impaired digestion. Balancing this ratio is a major focus of your recommended diet, supplement, lifestyle and detoxification program.

The results shows that you currently have a low inverse Na/K ratio.

B. THE CALCIUM / MAGNESIUM RATIO, OR BLOOD SUGAR OR LIFESTYLE RATIO.

- An ideal ratio is about 6,67. A good range is between about 4 and 9.5. **Your value is: 15,17.**
- Calcium is necessary for the release of insulin from the pancreas. Magnesium prevents insulin release.
- Magnesium is necessary to keep Calcium in solution.
- Very high (> 16) or very low (<2.0) ratio is often associated with mental or emotional disturbances.

Interpretation and symptoms:

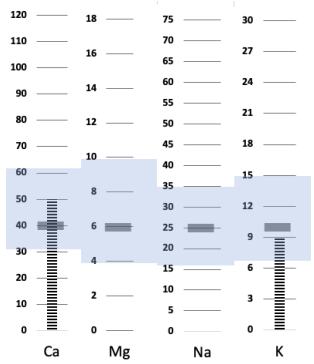
- *Whom:* A common imbalance in every group, including children and adults of both sexes. Causes for imbalance. On a first hair test, the cause is often too many carbohydrates in the diet. When the ratio is over 13.5, the cause is a lifestyle factor or attitude that is not helpful.
- *Physiology.* We are not sure why an imbalanced ratio is associated with imbalances in the diet or lifestyle. Dr. Eck taught that calcium and magnesium have to do with insulin regulation.
- *Spiritual defensiveness — a need for change pattern.* A ratio greater than 13.5, especially on an initial hair analysis, is a newer pattern that was not part of Dr. Eck's original work. In our experience, it often indicates a person is defending a lifestyle factor, such as a job or relationship, or an attitude that one needs to move away from to move ahead at full speed in one's life. The attitude that needs changing is usually anger, but it could be many others such as cynicism, rigidity, fear, negativity or another. When seen in children, the problem usually has to do with school or relationships with parents or siblings.

- *On retests*, elimination of bio unavailable calcium. During a nutritional balancing program, the body often eliminates bio unavailable calcium. This can elevate the calcium level and the calcium/magnesium ratio on hair mineral retests. This is not important.
- *Signs and symptoms* are typically not prominent with this pattern.
- *Charging*. A low Ca/Mg ratio may be a type of 'charging' pattern, similar to a high Na/K ratio. However, a ratio greater than about 25 may be a type of discharging pattern, similar to a low Na/K ratio.
- *Mineral loss*. A ratio below 2 or above about 60 may reflects deeper health imbalances such as a magnesium or calcium loss through the hair. It may be associated with high mercury.
- *Type of movement.* A very high ratio is the world pushing back, slowing movement. A slightly low ratio may be the opposite - having some wind at your back.

C. CALCIUM / KALIUM RATIO OR THYROID RATIO.

- An ideal ratio is about 4. A good range is about 2 to 6. **Your value is: 60,67.**
- Is called the thyroid ratio because Calcium and Potassium play a vital role in regulating thyroid activity.
- Does not always correlate with a blood thyroid test because a hair analysis is a "tissue" test. Often a blood test shows normal values, but a hair analysis shows thyroid dysfunction. Sometimes symptoms of hypothyroidism are very obvious, but a hair analysis will show a hyperactive thyroid ratio. If you want to correct this through nutrition, it is wise to follow the HMA advice.
- The thyroid gland is one of the important organs that determines the metabolic rate in the body. A hyperactive thyroid is often associated with a fast metabolism.
- When the thyroid (but also and adrenal) ratio is not good, the efficiency in energy production decreases.
- Symptoms of decreased thyroid gland activity: cold hands and feet, feeling cold, dry skin, dry hair, tiredness, barely shedding, tendency to gain weight, tendency to constipation.
- Symptoms of overactive thyroid activity: excessive sweating, hyperactivity, irritability, nervousness, infrequent stools or diarrhea during stress, greasy hair and skin.

Interpretation and symptoms:



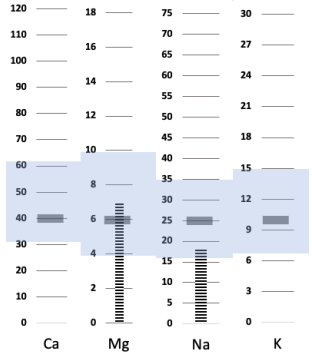
- *Whom:* Toddlers often have a low ratio, while older children and adults usually have a high calcium/potassium ratio.
- *Thyroid effect* at a cellular and organism level. Dr. Eck believed that a ratio less than 4 indicates excessive thyroid glandular effect at a cellular level. A ratio above 4 is a trend for sluggish thyroid and perhaps adrenal effect at a cellular and perhaps total organism level. One reason for this is that thyroid activity regulates calcium, in part. Also, potassium sensitizes the tissues to thyroid hormone. In addition, high hair calcium is related to reduced cell permeability. This may alter thyroid hormonal effects.
- *Very different from serum or saliva hormone levels*. Blood and saliva hormone levels may not match the hair indicators.
- *Causes for imbalances*. Many factors ranging from stress and emotions to nutritional depletion, autonomic nervous system imbalances and the prevalence of iodine antagonists and toxic metals can affect this ratio**.** It is truly a whole systems ratio.
- *Signs and symptoms*. A low ratio is associated with irritability, aggressiveness, anxiety muscle tightness, cramps and other symptoms of low calcium and magnesium. A high ratio is associated with fatigue, depression, pushing oneself hard, hypoglycemia, cravings for sweets, copper toxicity, perhaps low blood pressure, and chronic stress conditions of many kinds.

- *Oxidation rate assessment*. This is one of the two ratios used to assess the oxidation rate.
- *Grave's disease*. Oddly, a high calcium/potassium ratio is present in all cases of Grave's disease that has ever been seen.
- *Psychologically*, A low ratio is more associated with extroversion, joy and happiness. A high ratio is more associated with fatigue, depression and even despair and suicidal thoughts.
- *Hidden copper*. A ratio greater than about 10 is an indicator of hidden copper toxicity. Trying too hard. A ratio greater than about 100 indicates a person is pushing himself very hard in a generally ineffective way. It is a severe efforting pattern with poor results.
- *Type of movement*. A low ratio often indicates effective, fast and perhaps aggressive, uncontrolled movement. A high ratio is slower, perhaps stalled movement, with reduced effectiveness and 'the brakes on' if a calcium shell is present, too.

D. NATRIUM / MAGNESIUM RATIO OR ADRENAL RATIO.

- An ideal ratio is 4.17. A healthy range is roughly between 2 and 6.5. **Your value is: 0,42.**
- Also called adrenal ratio because it is directly related to adrenal function. Aldosterone regulates the "retention" of Na in the cell, the higher the Na value, the higher the aldosterone value.
- The Na / Mg ratio is also a measure of the energy output because the adrenal glands (in addition to the thyroid) determine the metabolic rate.
- The Na / Mg ratio is a tissue value; the blood values for adrenal hormones often do not match. The blood values are often normal, but this tissue test will show an abnormal adrenal function. However, the symptoms are consistent with the hair analysis.
- Symptoms often associated with under active adrenal glands: Allergies, depression, fatigue, poor stamina, hypoglycaemia, poor digestion (of fats and meat proteins, weight fluctuations).
- Symptoms often associated with overactive adrenal glands: Aggressiveness, impulsivity, diabetes, high blood pressure, high stamina, risk of inflammation.

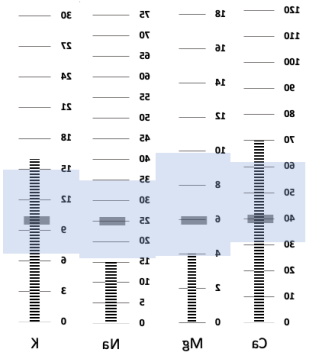
Interpretation and symptoms:



- *Adrenal effect* at a cellular and organism level. A ratio above 4.17 is a trend for excessive adrenal and thyroid effects at a cellular level. A ratio less than 4.17 is a trend for reduced adrenal and perhaps thyroid effect at a cellular level.
- *Different from serum, urine or saliva adrenal hormone testing*. Hair analysis adrenal assessment will not always match the levels of cortisol and other hormones measured in serum, urine or saliva because the hair measures a cellular effect, not hormone levels.
- *Causes for imbalances*. Autonomic imbalance combined with nutritional deficiencies, toxic metal excess and too much stress on the body are primary causes. A whole systems ratio.
- Signs and symptoms. A high Na/Mg ratio is associated with anxiety, irritability, higher blood pressure and blood sugar, anger, irritability and acute conditions, A low Na/Mg ratio is associated with fatigue, perhaps lower blood sugar in most cases, low blood pressure, low body temperature, sweet cravings, salt craving and others symptoms of weak adrenal glands.
- *Oxidation rate assessment*. This ratio is part of the assessment of the oxidation rate.
- *Psychology*. A high ratio is more associated with extroversion, joy and aggressiveness. A low ratio is associated with apathy, lethargy, depression and despair.
- *Type of movement*. An elevated ratio is forceful, effective, powerful and could become uncontrolled. A low ratio is much slower, and less effective.

8.2 Special patterns and possible personality traits

THE BOWL PATTERN.

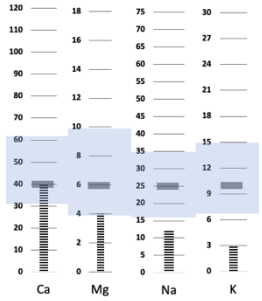


Definition: A Ca/Mg ratio greater than 9.5 and a Na/K ratio less than about 2.5.

Interpretation and symptoms:

- *Whom:* Almost always seen in adults. Hardly ever seen in children. Causes. Nutrient depletion and toxic metal excess, but with an important lifestyle component as well. It is very common today.
- *Defensiveness plus hostility*. This pattern combines defensiveness (a high calcium/magnesium ratio) and frustration, resentment and hostility (a low sodium/potassium ratio). In defending one's hostility, one must feels stuck and emotionally blocked.
- *Psychology.* This interesting pattern is a partial collapse, with some disregulation of the HPA-axis (adrenal exhaustion in all cases). Yet the person is defending something that is not working for him or her.
- *A stuck or dilemma pattern*. A person feels stuck with no way out.
- *Signs and symptoms*. These usually have to do with a low sodium/potassium ratio and a high calcium/magnesium ratio and may include fatigue, a diet too high in carbohydrates, and general stress symptoms. Opposite of the hill pattern.
- *May resolve easily with nutritional balancing*. Nutritional balancing often quickly helps resolve this pattern. This would indicate the dilemma or stuck feeling has a lot to do with physical health imbalances. When the pattern remains on a retest, it is likely due to deeper emotional conflicts.
- *Diabetes*. This pattern is associated with a diabetic tendency, since it incorporates both a low sodium/potassium ratio and an elevated calcium/magnesium ratio.
- *Less reliable on retests*. On retests, the body often eliminates bio unavailable calcium. This can result in a falsely elevated calcium/magnesium ratio.
- *Visual.* The pattern often looks like a bowl on a calibrated ARL hair chart. It also looks like the person is collapsed in the middle and held up on the sides. Often the bowl is distorted in its shape. The bowl shape cannot be seen if any of the mineral levels are off the chart. Analogy. The person feels like an insect stuck in a toilet bowl or sink bowl. He tries to climb out, but without success. Nutritional balancing seems to give the person a lift, literally. Retracing. At times, a bowl pattern occurs just on a retest. The body may have released toxic metals that were 'crutches' and this causes a temporary mild collapsing. This may be retracing a time when the body took on toxic metals as a way to cope with a dilemma. A fast, slow or mixed oxidizer. This affects the meaning of the pattern to some degree.
- *Types of movement*. Stalled movement. Closed, meaning not open to change.

STRESS FROM WITHIN AND WITHOUT.

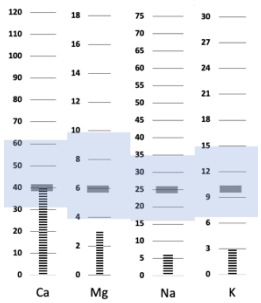


Definition: A sympathetic dominance pattern (low potassium) combined with a spiritual defensiveness (high Ca/Mg ratio). Calcium, however, does not have to be very high.

Interpretation and symptoms:

- *Whom:* This usually occurs in more spiritually-minded people who are trying too hard to fit in with family, friends, school or society. It can occur as early as the teenage years or perhaps even younger, and probably occurs more often in young women than in young men.
- *Causes*. Pushing oneself when either an attitude or a lifestyle situation is not helpful and is not working well. Common examples are regular high schools or college situations.
- *A combination* of pushing oneself and a situation that is holding one back on one's life path and needs to change. The stress from within comes from pushing oneself. The stress from without is the situation or attitude that is not working and needs to change.
- *A result, at times, of just continuing to push oneself*. If a young person is not careful, it is easy to create a situation that will not work out. This is an arrested development pattern because in some way the person has moved in a direction that is not working well.
- *A stalled, fast-to-slow transition pattern (sympathetic dominance).* However, it is with a definite subject of some kind related to lifestyle or attitude.
- An important '*need to move on*' pattern. It may have to do with an attitude or some aspect of lifestyle such as a job, schooling, or a relationship.
- *Similar to the trying too hard pattern*. The main difference is that instead of withdrawing into a calcium shell, the person has created or is caught in a lifestyle situation or attitude that is not working well for him, or more likely for her.
- *Signs and symptoms*. Depression is common, along with fatigue, hypoglycemia, and adrenal burnout symptoms (disregulation HPA-axis / adrenals).
- *Type of movement*. Slow, stalled, forceful, blocked.
- *Variants*. This pattern could combine with a calcium shell, a low sodium level, a high or low sodium/potassium ratio, bio unavailable calcium and magnesium, or four lows. This is not intended to confuse the issues, but to illustrate how complex these patterns can become.

BURNED OUT SYMPATIC DOMINANCE (HPA-axis disregulation)



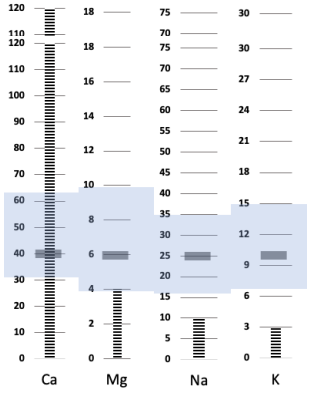
Definition: A sympathetic dominance pattern (low potassium) and a low sodium/potassium ratio.

An HPA-axis disregulation (depletion) is visible when as much Sodium as Potassium show a value that is too low. An HPA-axis disregulation (overload) is a reduced ability to handle stress properly. In addition, insufficient amount of hormones are produced by the adrenal glands. The main hormones produced by the adrenal cortex are aldosterone and cortisol. A good balance between these two hormones is very important for good health.
Your HMA result shows both a low Sodium and a low Potassium value. These values are associated with a degree of HPA-axis disregulation (overload or underactivity of the adrenal glands).

Interpretation and symptoms:

- *Whom:* Young adults in most cases.
- *Causes*. Pushing oneself to exhaustion, with a negative attitude of hostility and resentment.
- *Signs and symptoms*. Extremely low energy, depression, hypoglycemia, aches and pains, allergies and other low adrenal symptoms. Eventually serious health problems may occur.
- *Copper toxic, but with a need for some copper supplementation*. Although copper toxicity is present, Dr. Eck found they need some copper to come out of the pattern.
- *Type of movement*. Very slow, reversed and very ineffective. Dangerous if it persists.
- *Traditional Chinese medicine and chakras*. Extreme yin with yin deficiency. Very unbalanced first chakra in most cases.

SEVERE LIFESTYLE OR ATTITUDE STRESS.



Definition: A calcium shell (very high calcium) combined with spiritual defensiveness pattern (a high Ca/Mg ratio).

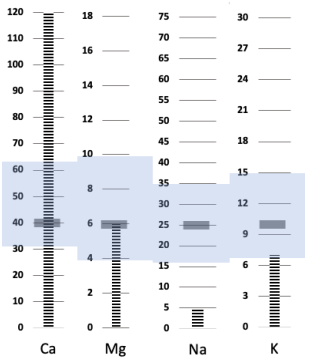
Interpretation and symptoms:

- *Whom:* Uncommon pattern, usually younger adult women.
- *Causes.* Staying in an unhealthy relationship or work situation, or holding on to a negative attitude, especially in a sensitive person.
- *Psychology.* One who is very unhappy in a situation that is neither helpful nor necessary.
- *Signs and symptoms*. Usually tired, anxious, irritable, muscle cramps, insomnia, with perhaps depression and other emotional and physical symptoms, depending upon how long the pattern has been present and how extreme the pattern is.
- *Type of movement.* Stalled, slow, and somewhat blocked because the brakes are on tightly.

Variants. This pattern may combine with sympathetic dominance, a low sodium/potassium ratio, very slow oxidation, a double high ratio, a slow bowl, step down pattern, four highs or even with a fast oxidation rate if there is a significant secondary alarm reaction. Once again, this is just to illustrate how complex hair analysis interpretation can become.

SEVERE BURNOUT

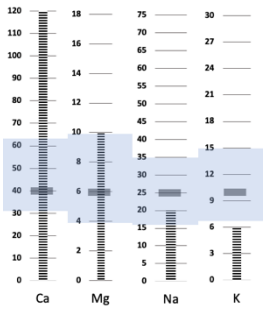
Definition: A calcium shell (very high calcium level) with a low sodium/potassium ratio.



Interpretation and symptoms:

- *Whom:* More common in women, but may occur in any group.
- *Causes*. Nutritional depletion plus emotional withdrawal.
- *Signs and symptoms*. Depression is prominent, though the person is usually very out of touch with feelings and with reality due to two lowered awareness patterns present at the same time. Other symptoms of HPA-axis disregulation (adrenal exhaustion) are also common such as aches and pains, sweet cravings, exhaustion, low blood sugar and others.
- *Type of movement*. Blocked by a shell, the brakes are on, and reversed. Not a healthy situation at all.

WASTING ONE'S TIME.

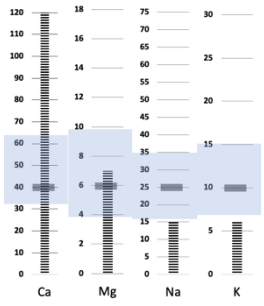


Definition: A calcium shell (calcium above 170 mg%), sympathetic dominance (potassium less than 5 gm%)) and a spiritual defensiveness pattern (calcium/magnesium ratio above 13.5).

Interpretation and symptoms:

Causes. Probably more common in women who are stuck in relationships that do not serve them, or anyone stuck in a job or with an attitude that does not serve them.
Unhealthy pattern. This is a quite a severe burnout pattern.
Signs and symptoms. These include fatigue, hypoglycemia, and later on may be associated with cancer and other serious illnesses.
Type of movement. Willful and forceful, but with the brakes on, stalled or reversed.

CALCIUM SHELL SHELL OR TIRED - VERY HIGH CALCIUM.



Definition: A hair calcium level greater than about 170 mg%. The higher the calcium level, the more severe the pattern. A calcium level greater than 250 mg% indicates a severe calcium shell. The laboratory occasionally reports calcium levels as high as 1200 mg%.

Interpretation and symptoms:

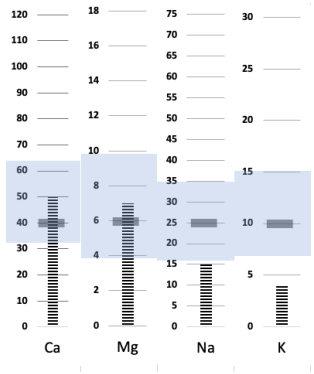
- *Whom:* This pattern is seen most often in young men and women, and more in women between the ages of 10 and 50 years of age. Older people cannot live well with it.
- *Causes.* Reduced solubility of calcium, usually along with magnesium, causes precipitation of some calcium and magnesium out of the blood. They deposit in the soft tissues such as the hair. Slow oxidation, HPA-axis disregulation (adrenal exhaustion) or perhaps psychological reasons may be causes.
- *Visually*. The pattern looks like a wall of calcium on the left-hand side of the graph.
- *Physiology.* Calcium, magnesium and copper are usually at toxic levels and bio unavailable to some degree. Often the person has calcium deposits in the joints, arteries, kidneys, brain and elsewhere. The oxidation rate is usually slow. Hyperparathyroidism rarely occurs. There can be a numbing of all sensation and thus lower sexual desire and sexual responsiveness.
- *Signs and symptoms*. Common symptoms include those of bio unavailable calcium such as irritability, insomnia, muscle tightness, muscle cramps, and other symptoms of low serum calcium. These are mixed with symptoms of high calcium such as aches and pains, arthritis, weakness, fatigue, depression, and flaccid tissues.
- *Psychology.* This is often a sensitive person who is withdrawing psychologically. At times, this is due to excessive stress or difficulty handling stress. The pattern can also just be a response to adrenal exhaustion and the need to protect oneself from further stress.
- *Defensiveness, guilt and depression* feelings are often present, and the person is often slightly out of touch with reality and living 'behind a wall of calcium'. This pattern is often one of retreat into oneself, with suppression or repression of feelings and even thoughts. It can also be a defense mechanism to protect against the ravages of a copper imbalance or a high copper personality type.

People with this pattern are often spiritually minded individuals who are sniggling to survive and thrive and in a world that is not of their making and not really to their liking. Most of them are lovely people who are more intelligent and sensitive than average and need assistance to cope with this world. Helping them is a true gift.

- *A death pattern* if very high. A hair tissue calcium level greater than 500 mg% is always associated with a tendency for cancer, despair, and being very out of touch with reality.
- *Schizoid pattern*. Some with this pattern are out of touch with reality or 'floaty' at times. This is usually related to high copper and perhaps other mineral imbalances. The higher the calcium level, as a rule, the more out of touch the person is with certain aspects of reality.
- *Retest consideration*. On a retest, a calcium level may rise due to an elimination of bio unavailable or 'metastatic' calcium from the tissues. This can mimic a calcium shell, when in reality it is not the case. Often in these cases, looking to the magnesium level will help one decide if it is a shell. If the magnesium is low ratio wise to calcium on a retest, it is less likely a calcium shell situation.

Type of movement. Usually very slow movement with the brakes on quite forcefully.

SYMPATHETIC DOMINANCE - LOW POTASSIUM.



Definition: A hair potassium level of 4 mg% or less. The lower the potassium level, the more extreme the pattern. Secondary indicators are a sodium/potassium ratio greater than about 6 and perhaps a Ca/K ratio above 100. These need not be present for the pattern to exist. When more indicators are present, especially with a sodium/potassium ratio greater than about 10 and a potassium level is 1 or 2 mg%, We call it a super or double sympathetic pattern.

Interpretation and Symptoms.

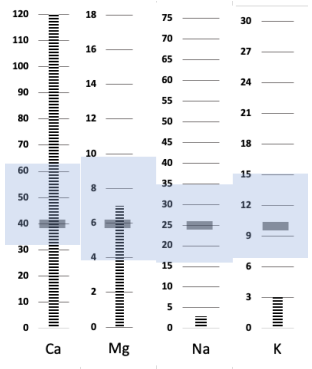
- *Whom:* Very common, perhaps more so in women than in men. Those with the pattern are more mentally oriented and often spiritually minded people.
- *Causes*. Severe efforting. Continuing to push oneself as though one is a fast oxidizer when the body has moved into the much lower energy pattern of slow oxidation. Lifestyle and mental tendencies are the main cause, though toxic metal poisoning can keep the pattern going by irritating the brain and nervous system.
- *Physiology*. HPA-axis disregulation (adrenal weakness), plus an extreme yin condition of the kidneys, apparently causes potassium loss from the tissues, and perhaps from the serum as well. This is a lifestyle pattern, meaning it is due mostly to one's thinking and behavior rather than to mainly biochemical imbalances, the diet, illness or a physical ailment. However, toxic levels of copper, iron, manganese, aluminum, cadmium and others can hold a person in this pattern. The person spends too much time in a fight-or-flight mode or 'sympathetic overdrive'. In other words, the sympathetic nervous system is overused. This prevents adequate rest and rejuvenation of the body, and eventually causes severe health problems.
- *Signs and symptoms*. Fatigue, even if the person denies it, as they often do. Others are low blood sugar, low blood pressure, hypothyroidism, occasionally Grave's disease, aches and pains, slow oxidation symptoms, copper toxicity symptoms, low body temperature, and possibly diabetes and cancer. Others are constipation and other bowel problems, all female health conditions such as PMS, depression, joint stiffness and calcium deposits.
- An important *fast-to-slow oxidation transition* or resistance-to-change pattern. The body has moved into slow oxidation, but the person is still thinking and acting like a fast oxidizer in some ways, usually with too much physical activity or excessive worrying. Dr. Eck called these people 'a

mind without a body'. Slowing down is hard for them, as it puts them in touch with their fatigue, so it makes them feel worse.

- *A burnout pattern*. These individuals are always exhausted to a degree from running around or worrying so much. Most have symptoms of HPA-axis disregulation (adrenal exhaustion) or burnout.
- *Secondary hyperthyroidism*. With too much stress, sympathetic dominants can develop Grave's disease or hyperthyroidism.
- *Psychology*. Often very intelligent, sensitive, spiritually-minded people, frying to fit in with friends, family, work or other life aspects. The person is often frantically running around or running around in one's head by worrying a lot. Driven, uptight, wound up, and often somewhat compulsive. An ADD pattern in children and adults. They are often distractible, anxious or just active all the time. If they slow down, they may 'crash' and don't feel like doing anything at all. There is a great need to relax. They are often ungrounded.
- *Doingness rather than beingness*. A person with this pattern is often caught up in 'doing', rather than relaxing into 'beingness'. In fact, we are human beings, not human doings. May lead to a spiritual defensiveness pattern, which is often a reflection of an improper attitude of anger or pushing to achieve something that is not really in one's best interest. Correction can be slow. The pattern is difficult to correct with diet and supplements alone, though easier in many cases than correcting a four lows pattern. If needed, a modified four lows type of supplement program will often speed up correction of sympathetic dominance. Diet. Sympathetic dominants often need more carbohydrates in the diet due to their peculiar blood sugar imbalances. They also need more fat than regular slow oxidizers because they have some qualities of fast oxidation. This is important in some, but not all cases. Sauna therapy helpful. Sauna therapy inhibits the sympathetic nervous system and is wonderful for those with the pattern. However, it will make them tired for a while.
- *Type of movement*. Slow forward movement, deliberate, willful, unable to move back into fast oxidation. Often a willful or stalled aggressive response pattern.

TRYING TOO HARD - HIGH CALCIUM WITH LOW POTASSIUM.

*Definition***:** A calcium shell (calcium greater than about 170 mg%) and sympathetic dominance (potassium of 4 mg% or less).

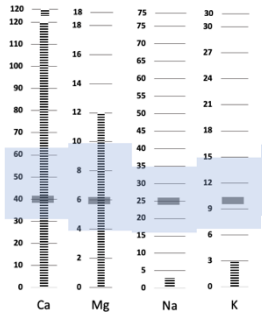


Interpretation and symptoms:

- *Whom:* This is seen mainly in spiritually oriented or sensitive slow oxidizing young women and some younger men. It may be found in some vegetarians, along with low zinc, high copper and low phosphorus. Those with the pattern are often unhappy in some way.
- *Causes.* Trying very hard to fit in can wear out the adrenals and lead to a calcium shell. This is a copper personality type as well. A weakened body, improper attitudes or just being out of touch with reality can also cause the pattern to emerge.
- Physiology. HPA-axis disregulation (adrenal burnout or exhaustion) coupled with bio unavailable calcium.
- *Psychology*. Trying hard to fit in and not succeeding, so one withdraws into a shell. Possibly a 'shattered' pattern. This is a personality trait in which a person is ungrounded and seeking hard, but not really knowing what he or she is looking for,
- *Signs and symptoms*. Usually a combination of those of a calcium shell and those of HPA-axis disregulation (adrenal exhaustion) and sympathetic dominance such as irritability, anxiety, fatigue, depression, aches and pains, muscle twitches and tensions, hypoglycemia or low blood pressure.

- *Type of movement*. Very willful, but stalled and ineffective, with the brakes on.

BIOUNAVAILABLE CALCIUM - HIGH CALCIUM WITH HIGH MAGNESIUM.



Definition: Calcium above 100 mg% and magnesium above about 9 mg%.

Interpretation and symptoms:

- *Whom:* Common in younger people, and more so women. Uncommon among older people because the pattern is often not sustainable for too long. Most cases are very slow oxidizers.
- *Causes.* HPA-Axis disregulation (adrenal fatigue), poor diet, lack of rest, toxic metal accumulation and perhaps illnesses and depression can be possible causes.
- *Physiology.* Low serum sodium and potassium reduces soluble calcium and magnesium in the blood. This causes precipitation of calcium and magnesium into the soft tissues.
- *Psychology.* Defended or defensive, with some degree of a calcium shell. Also some degree of withdrawal psychologically, and somewhat suppressed or repressed, emotionally inhibited, with somewhat lowered awareness and perhaps somewhat out of touch with the body. It may be part of some copper personality types. It is often a sensitive person in an exhausted state. Signs and symptoms. These may include a mixture of calcium deficiency and calcium excess symptoms. Calcium deficiency symptoms include irritability, anxiety, muscle tightness, muscle cramps, and insomnia. Symptoms of calcium excess in the tissues include joint pain due to calcium deposits, arteriosclerosis and high blood pressure later in life, weakness, thyroid and adrenal imbalances, acidic pH because bio unavailable calcium is unable to neutralize acids as well and due to mineral deficiencies, mental decline and others.
- *Type of movement*. Slow and often ineffective movement, perhaps with the brakes on and perhaps reversed if the sodium/potassium ratio is low.

SLOW ON CRUCHES.

The following macro mineral pattern often cannot be read directly on a hair analysis. At times, they may be identified indirectly, or one must wait for a retest to identify this pattern:

Definition: A slow oxidizer whose oxidation rate looks faster than it really is because the oxidation rate is supported or enhanced by 'crutches'. These are often bio unavailable forms of iron, manganese, copper, or perhaps some aluminum, cadmium, lead and other toxic metals.

Interpretation and symptoms:

- *Whom:* Many slow oxidizers are ‘on crutches’.
- *Causes.* As a person tires out and becomes nutritionally depleted, the body accumulates the `crutches' or toxic metals to help balance body chemistry. The crutches may irritate the adrenals, the kidneys or perhaps the nervous system to stimulate adrenal hormone output.
- *Stimulation, not nourishment*. The action of the crutches, unfortunately, is mainly stimulatory and not nourishing. As a result, they eventually lead to HPA-axis disregulation (adrenal burnout).

- *Physiology.* Many of the crutches appear to be metal oxides and may cause oxidant damage. They include copper, iron, manganese, chromium and selenium oxides. Lead, cadmium and other toxic metals also form oxides and other irritant compounds in the body.
- *Medical drugs are other common crutches*. They may include thyroid and adrenal replacement hormones, ADD drugs, anti-depressants, cigarettes, recreational drugs such as marijuana and cocaine, and a few others.
- *Psychology.* The 'crutches' allow a person to keep functioning. However, one is more unstable, more tired, and unhealthier than the hair test even indicates.
- *Signs and symptoms*. One usually has a mix of symptoms of slow oxidation and symptoms related to one's particular crutches, as most are quite toxic. For example, many have copper toxicity symptoms such as headaches, PMS, rashes and acne.
- *Rollercoaster oxidation rates and energy levels*. The release of one's crutches during a nutritional balancing program causes ups and downs in a person's oxidation rate and energy level during the program. Eventually, most of the crutches come out and energy stabilizes.
- *Healing requires years in some cases to rid the body of crutches*. The crutches will not be released until they are no longer needed.
- *Hidden crutches*. Besides the crutches discussed above, others may include exotic toxic metals and hundreds of toxic chemicals that are impossible to detect. However, they, too, will contribute to energy fluctuations and erratic changes in the oxidation rate on repeated hair tests as they are eliminated from the body.
- *Type of movement*. Crutches enhance forward movement in most cases and are useful for this reason. This is why they are called crutches, not simple poisons, though they are toxic.

COPPER UNBALANCE

It is possible for a person to become copper-toxic, copper-deficient or to have a condition called biounavailable copper. The first two of these are fairly easy to understand. Refined food diets are low in copper in many cases. Also, some, especially children, need much more copper than others. This has to do mainly with their metabolic type or body chemistry. Fast oxidizers need more copper while slow oxidizers often have too much. Those who we find are fast oxidizers require a lot more copper. Slow oxidizers often have excessive copper in their bodies. Thus, they are far more prone to copper imbalance of this nature.

What is biounavailable copper? In this very common situation, copper is present in excess in the body, but it cannot be utilized well. The reason it occurs is that minerals such as copper must be bound and transported within the body. Biounavailability often occurs due to a deficiency of the copper-binding proteins, ceruloplasmin or metallothionein. Without sufficient binding proteins, unbound copper may circulate freely in the body, where it may accumulate primarily in the liver, brain and female organs. **This occurs any time adrenal gland activity is low.**

When copper is biounavailable, one may have symptoms of both copper toxicity and copper deficiency. Copper toxicity and biounavailability are seen most often. These occur almost always in people who are in the state called slow oxidation. Copper imbalance is commonly associated with fatigue, emotional hypersensitivity, depression, mood swings, anxiety, sleep disturbances, skin problems, fungal infections and many other conditions.

Een ideaal bereik van koper in het haar is ongeveer 1,5-2,5 mg% of ongeveer 15-25 ppm. Elk hoger getal duidt meestal op overmatig koper in het haarweefsel en, bij uitbreiding, in andere weefsels van het lichaam. Een haarkoperniveau van minder dan ongeveer 1,5 mg% duidt meestal op verborgen kopertoxiciteit.

An ideal range of copper in the hair is about 1.5-2.5 mg% or about 15-25 ppm. Any number higher than this tends to indicate excessive copper in the hair tissue and, by extension, in other tissues of the body. A hair copper level of less than about 1.5 mg% usually indicates hidden copper toxicity.

Your analysis shows the following:
Biological unavailable copper present: Yes
Hidden copper present: Yes
Copper suppletion needed: Yes

Assessing the need for copper supplementation. A need for copper supplementation does not mean the entire body is low in copper. It just means that some is needed to balance the chemistry at a particular time. This is confusing, but it works well. Dr. Paul Eck researched this subject thoroughly, and we find that his methods work beautifully. Following are hair tissue mineral analysis indicators for a need for copper supplementation:

1) A fast oxidation rate.
2) A hair Na/K ratio less than about 2.0
3) A hair Ca/Mg that is less than about 3 is a secondary indicator and it only applies if the hair sodium/potassium ratio is less than 2.0.
4) Combinations: Fast oxidizers with a low sodium / potassium ratio require more copper then if only one of the above patterns is present. Even more copper is needed for a 'Step UP' pattern, which has all three of the above combinations.

9 Food diet patterns

Sugar and carbohydrate tolerance
The excessive intake of carbohydrates in the diet is often associated with the development of many health conditions including, glucose (sugar) metabolism, digestive difficulties, yeast infections, fatigue, depression and others. Excessive carbohydrates may also upset the balance between calcium and phosphorus and between calcium and magnesium.
Inasmuch as the release of insulin is promoted by calcium and inhibited by magnesium, the proper ratio of calcium to magnesium is critical for optimal insulin secretion, thus resulting in one's ability to properly metabolize sugars and simple carbohydrates.

The adrenal glands also play a major role in regulating carbohydrate metabolism in the body. A low sodium/potassium ratio is indicative of excessive glucocorticoid production. Potassium reflects glucocorticoid levels (regulates glucose metabolism), while sodium reflects mineralocorticoid levels (regulates salt and water balance). When the mineralocorticoid hormones get out of balance with the glucocorticoid hormones, an individual can also develop a sensitivity to the ingestion of sugars and simple carbohydrates.
Simply stated, one's inability to cope with stress is associated with a low sodium/potassium ratio. Being that a high potassium level relative to the sodium level represents an excess of sugar-raising hormones, a stress-induced sensitivity to the ingestion of sugar and simple carbohydrates occurs.

- **Your body indicates an imbalanced glucose (sugar) metabolism. This is visible in the high Ca/Mg ratio and the low Na/K ratio.**

Protein Synthesis
Adequate protein synthesis is vitally important for the regeneration of all body tissues. This requires proper digestion, absorption and utilization of proteins. Protein synthesis is influenced by the amount

and type of protein consumed in the diet and by one's eating habits. An elevated phosphorus level is indicative of rapid protein breakdown, while a low phosphorus level indicates inadequate protein synthesis. The mineral zinc must be singled out as particularly important for protein synthesis. It is required for the enzyme RNA transferase, a key step in protein synthesis. A low sodium/potassium ratio reveals significant information regarding the individual's capability of utilizing protein. The lower the sodium/potassium ratio, the less protein can be synthesized.

- **Your body indicates a decreased protein synthsis at this moment. This is visible in your low Phosphor value.**
- **Since a low Na/K ratio reveals significant information regarding an individual's capability in utilizing protein, your low Na/K ratio is contributing to an impaired protein synthesis at this time.**

Digestion
Excellent digestion is a key to improving one's health. If digestion is impaired, even the best diet will not supply the body with needed nutrients. Additionally, improperly digested food will ferment or putrefy in the intestines and produce extremely toxic chemicals that are then absorbed into the body. Proper digestion depends on one's diet, eating habits, energy levels, digestive enzymes, bowel flora and the condition of the intestines.
Phosphorus levels are highly indicative of one's ability to synthesize protein. The inability to synthesize protein frequently results in impaired digestion.
A low sodium/potassium ratio is indicative of an excessive stress situation, which will eventuate in a reduction in both hydrochloric acid and pancreatic digesting enzymes.
Extreme fast oxidation pattern is often associated with a tendency for excessive stomach acid secretion when under stress. This can result in poor digestion to some degree.
Zinc is required for all digestive enzyme production. It is also required to rebuild the fast-growing intestinal tissue, and for the production of bile and liver and pancreatic secretions.
Excessive tissue copper can result in poor digestion and poor motility of the bowel, hence resulting in food putrefaction resulting in gas and bloating often associated with poor digestion.

- **Your body shows an impaired digestion at this time. This is visible in your low Phosphor value.**
- **Since a low Na/K ratio reveals significant information regarding an individual's capability in digesting protein, your low Na/K ratio is contributing to an impaired digestion at this time**

10 Organs and system patterns

Immune system activity
The immune system is a network of organs, cells and tissues that work together to provide the body's first line of defense against organisms, toxins and substances that invade our systems and cause disease. The immune system has many aspects including the health of the white blood cells, the digestive tract, cell membranes, antioxidant nutrients and the autonomic balance. Certain indicators on a hair tissue mineral analysis often reflect the overall condition of the immune system.
A low sodium/potassium ratio results in an impaired immune system response, due to one's inability to adequately synthesize protein.
A very high sodium/potassium ratio may indicate kidney stress and an imbalanced immune system. A high ratio may indicate autoimmune problems, or an overactive immune system.
A zinc deficiency, or loss, will impair immune system function. Zinc is involved in all protein synthesis and is required for the integrity of the skin and mucus membranes of the body, which are critical tissues in defending against infection.
Chronic over-activity of the adrenal glands in the "fast" oxidizer has a suppressive effect upon the thymus gland, thus impairing immune system function.

A copper imbalance often indicates impaired immune system function. Copper is required for energy production within the cells and mobilization of copper from the liver which is part of the normal infection-fighting mechanism of the body. The mineral itself is a fungicide and an anti-bacterial.
A low tissue zinc/copper ratio is frequently associated with an immune deficiency, due to excessive tissue copper displacing zinc, which is necessary for immune system function.

- **The analysis indicates an impaired immune system that may limit the body's ability to remain in a healthy state. This is caused by a low Na/K ratio,a low Zn/Cu ratio, Zinc depletion or Zinc loss a Copper unbalance,**

Liver and Kidney Stress
The liver is the largest gland in the body and performs a large number of functions that impact all body systems. Some of the functions performed by the liver include the filtering of harmful substances from the blood, the storage of vitamins and minerals and the maintenance of proper blood sugar levels. The liver is also responsible for the production of cholesterol and other vital substances.
The main function of the kidneys are to separate toxins and other waste products from the blood. They are also involved with the regulation of blood pressure and maintaining the balance of water, salts and electrolytes.
Both the liver and kidneys are very important organs of detoxification and are common sites of toxic metal accumulation.
Certain indicators on a hair tissue mineral analysis, i.e., sodium/potassium ratio, excess tissue copper, high levels of iron and manganese, or the presence of toxic metals, such as mercury, cadmium, arsenic and aluminum, often reflect the overall condition of the kidneys and liver.

- **The analysis indicates a trend for liver and kidney stress.** This may contribute to impaired toxic metal elimination, impaired immune system, carbohydrate intolerance, fluid imbalances and other conditions that may affect liver and kidney function. This is caused by a high Copper value, an increased Aluminium value.

Inflammation
Inflammation is the body's normal reaction to an injury, disease, or the presence of a foreign substance. Inflammation is generally recognized by swelling, redness, heat, or possibly pain. If the body can overcome the causative factor, then the inflammation is reduced, and the inflammatory process terminates. However, if the inflammatory process continues, inflammation can become chronic.
Acute inflammation generally causes an increase in adrenal activity and thus a rise in the secretion of the hormone aldosterone (sodium). Aldosterone is a pro-inflammatory hormone. Cortisol and cortisone (potassium) are anti-inflammatory hormones because they diminish inflammation. The pro-inflammatory and anti-inflammatory hormones need to be in balance with each other for optimum health.

Certain indicators on a hair tissue mineral analysis often reflect inflammation and/or an inflammatory response in the body.

- An elevated sodium/potassium ratio, as determined by a hair analysis, is an excellent indicator of the predominance of the pro-inflammatory hormones (represented by sodium on a hair analysis chart) over the anti- inflammatory hormones (represented by potassium).
- A low sodium/potassium ratio, as determined by a hair analysis, is an excellent indicator of excessive protein catabolism (breakdown) which is frequently associated with an inflammatory condition. Degeneration of the joints causes inflammation and joint pain.
- A magnesium deficiency relative to a high sodium level, as indicated by an elevated sodium/magnesium ratio on a hair analysis, is often associated with an inflammatory process.

- Acute stress can result in an inflammatory reaction. Many factors can be the source of stress, such as a change in weather, change in diet, fatigue, toxic metal accumulation, emotional conflicts, etc.
- A low potassium level represents inadequate glucocorticoid (anti-inflammatory) activity, which often contributes to an inflammatory tendency.
- Copper, in excess, can result in a suppression of anti-inflammatory hormones. A deficiency of anti-inflammatory hormones is responsible for an inflammatory process.
- Excess iron is known to deposit in the joints, resulting in an inflammation of the joints.
- **Your hair tissue mineral analysis currently indicates the presence of an inflammatory tendency as is shown in a low K value, (inadequate glucocorticoid (anti-inflammatory) activity), high Copper value, (suppression of anti-inflammatory hormones),**

Cell wall permeability.
Cell wall permeability refers to the ability of the cell to take up or excrete substances, whereby they must pass through the cell wall. The cell wall is the most important communication / transport system between the cell and its outside world.

- **The analysis indicates significantly decreased cell permeability.** This impairs the entrance of hormones, glucose and other substances into the cells. It also impairs the elimination of toxic substances from the cells. This may contribute to reduced adrenal gland activity, thyroid imbalance, cellular nutrient deficiencies, cellular toxicity and often symptoms of low cellular glucose or insulin resistance.

11 The 4 macro minerals

Calcium: Calcium is found in every cell in the body. More than 90% is present in the bones and teeth. Calcium is regulated by the thyroid, parathyroid, adrenal and pituitary glands. Calcium plays a role in maintaining the acid-base balance. It is necessary for normal blood clotting, nerve conduction, muscle contraction and relaxation, cell division, heart rate, in the nervous system, muscle function and relaxation and the maintenance of bones and teeth. It is primarily an extracellular element.

Excellent quality bioavailable calcium is missing from most people's diets. The main food sources are raw and organic dairy products, carrots and carrot juice and some other vegetable sources such as nuts and seeds. However, if cow's milk is pasteurized and homogenized, the amount of available calcium drops sharply. As a result, most people don't get enough calcium from the milk, cheese and yogurt they consume.

- An elevated calcium level does not automatically mean the presence of too much calcium in your diet or in the body. You often see an abnormal deposition of calcium in the hair or other body tissues. For this reason, calcium supplementation is recommended. This abnormal deposition of calcium in the hair or other body tissue is described by Dr. Paul Eck also referred to as the 'Calcium Shell'. This is often associated with feelings of introversion and withdrawal, defenses and depression. Extreme calcium deposits in the tissues have a depressing effect in the central nervous system. An increased calcium value in the hair analysis can also serve as an extra buffer against extreme stress. In many cases, a high calcium level is an indicator of 'biologically unusable calcium,' meaning that it is present in the body but cannot be properly used by the body.

Magnesium: Magnesium is needed in bones and the nervous system. It is essential in more than 600 different vital enzyme reactions in the body. It is primarily an intracellular element.

- Your Magnesium level has increased, but it does not automatically mean that your body contains too much Magnesium. Most people don't take enough magnesium. It is often associated with

increased magnesium deposits in tissues such as hair. Therefore magnesium supplementation is recommended.

Sodium: Sodium is an essential mineral for the maintenance of proper fluid balance and blood pressure in the body. It is primarily an extracellular element.

- Low sodium levels are often attributed to increased calcium excretion due to decreased adrenal activity. This can contribute to fatigue symptoms and decreased blood sugar. A low sodium level does not automatically mean that you are consuming too little salt.

Potassium: Potassium is primarily an intracellular element that is necessary for a good fluid balance, nervous system and muscle activity.

- Low potassium levels are often attributed to increased potassium excretion as a result of decreased adrenal activity and the body's stress depletion phase. This can contribute to a feeling of tiredness and a lowered blood sugar level.

12 Nutrient Mineral Patterns

Iron: Iron is necessary for energy production, blood formation and the antioxidant effect (catalase). An excess of iron can contribute to liver and vein disorders, dementia or behavioral disorders.

- In most cases, low iron does not directly mean a lack of iron, but represents the amount of unavailable iron. This means that an excess of iron is present in the liver or other organs, but this is not visible in the analysis at this time. An iron imbalance results in general fatigue.

Copper: Copper plays an important role in tissue health, female fertility, cardiovascular health, blood formation, energy production, neurotransmitter activity and the immune system.

- Your copper level is currently above an optimal range which indicates a copper toxicity, or an elimination of excess tissue copper.

Manganese: Manganese is necessary for sugar metabolism, good tendon and joint ligaments, energy production and adrenal function.

- A low manganese level is often associated with a manganese deficiency in the diet, especially if one consumes refined foods or white sugar.

Zinc: Zinc is found in small quantities in the body (about two grams) and is essential for over 50 functions including all protein synthesis, growth and development, male reproductive system, insulin production and secretion, vision, digestion, prostate health, skin, hair and nail health, and immune system activity.

- The zinc value is in the right range. However, for a proper assessment it must be viewed in relation to the other minerals. Factors such as hidden toxic metals, nutrient deficiencies or drug use can influence this value.

Chromium: Chromium is necessary for sugar and carbohydrate tolerance and cholesterol metabolism.

- A low chromium content means a large fluctuation in blood sugar levels, a strong need for sugar or starch. It can lead to fatigue and high cholesterol.

Selenium: Selenium is required for thyroid function. Selenium is an essential component of the enzymes that convert Thyroxine (T4) to Triodothyronine (T3). Selenium is also important in heavy metal detoxification and is also important in enhancing immune system function.

- A low selenium level may contribute to impaired detoxification and thyroid gland activity.

Phosphor: Phosphorus is an essential mineral that is involved in protein synthesis and energy production within the cells. All proteins contain phosphorus and thus are a significant source of organic phosphorus. The hair tissue mineral level of phosphorus is often associated with the adequacy of protein synthesis in the body. This depends on the diet, lifestyle, condition of the intestinal tract and liver and the levels of other nutritional minerals such as zinc and copper.

- A low hair tissue mineral phosphorus level indicates excessive protein catabolism or tissue breakdown. This may be due to improper diet with a low protein intake, inadequate protein quality, impaired digestion, imbalanced intestinal flora, intestinal infections such as candida albicans or other parasitic infections. Other considerations that may play a role in a low phosphorus level are a low zinc level or a hidden copper toxicity. These mineral imbalances can impair protein synthesis which requires a zinc dependent enzyme, RNA transferase. Improper eating habits that interfere with digestion may also contribute to your low phosphorus level at this time. Balancing the phosphorus level with dietary modifications, digestive enzymes and nutritional balancing is most important as adequate protein synthesis is important for the regeneration of all body tissues.

13 Toxic metals and toxic elements

Heavy metals pose a serious health threat. A serious problem nowadays is the large number of babies born with metal poisoning. No healthy values for heavy metals are known; lowering the presence is a spearhead of the nutritional balancing program. The HMA analysis does not test for toxic chemicals. However, when energy production can be increased, the sympathetic nervous system is brought into balance, and help is provided in the proper functioning of the organs that release toxins, the chemicals will also be removed. The HMA analysis shows the metals that are present in the hair. No single test can detect all toxic metals because some metals are stored deep in the body tissue. The analysis itself is not aimed at demonstrating these, but rather focuses on obtaining a balanced and safe removal, without the use of metal chelators. Toxic metals often lie deep in tissues, layer by layer. Our proposed program (diet, supplements, lifestyle and detox program) aims to remove these metals. Hidden metals often become visible in future HMA results as removal occurs through deposition in hair and skin.

Copper: An increased copper value indicates an excess of copper in the fabric, or copper overload. Copper accumulates in the liver, brain and kidneys, and these are basically storage organs to prevent too much copper from entering the blood. An increased copper value in a hair mineral analysis indicates the presence of biologically unusable copper. Although the copper is present in excess in the tissues, it cannot be properly metabolized. Due to the relationship between copper and zinc in the body, a low Zinc / Copper ratio indicates a copper overload. A copper imbalance can be caused by active adrenal glands, a zinc deficiency, an exposure to copper in the environment or transmission from the mother to child via the placenta.
The high copper value indicates an excess of copper in the tissues or copper poisoning. Research shows that an excess of copper is strongly related to many emotional and physical complaints.

Aluminium: Aluminum is the third most abundant element and the most abundant metal in the Earth's crust. Individuals are naturally exposed to relatively large amounts of aluminum through food, water and air. Sources of aluminum are food and drinks packed in aluminum (cans, for example), aluminum foil that is used in cooking, or the use of aluminum cookware such as pans, deodorants, antacids, table salt, sometimes it is in baking powder and tea etc. Aluminum is mainly stored in the lungs, liver, thyroid, bones and brain. Aluminum poisoning can give rise to symptoms of memory loss, dementia, fatigue, behavioral problems and eczema.
Your hair analysis shows that Aluminum is present in the tissues at this time.

14 General food diet information

Balancing your body takes time. In many cases, vital minerals will have to take the place of toxic metals such as lead, cadmium, mercury, aluminum and others. This process can take months, sometimes years, depending on the health condition at the start of the program. It is generally known that it often takes 6 months to completely rebalance 1 mineral such as iron, for example. Additional factors such as diet, lifestyle, stress and medication can influence mineral ratios and recovery.

General diet principles[1]
For a slow and slow-mixed oxidation type, the general principles are:
High amount of low fat protein foods (fish, poultry, beans, grains, eggs.
Little fat.
Average amount of unrefined carbohydrates (whole grain, vegetables, beans, peas, root vegetables (e.g. potatoes), pumpkin).
Avoid fatty meals, organ meats and dairy products.
Eat a lot of vegetables, twice a day.

Both the dietary supplement and diet program recommended are of great importance to the success of the program.

- The eating habit is just as important as the food itself. Take your time, and don't eat on the job.
- Eat regularly at set times.
- Chew well, eat slowly and wait 10 minutes before returning to work.
- Food should be as fresh as possible. Simple combinations instead of complex meals can aid digestion.

Lifestyle
A healthy lifestyle improves the speed of your recovery significantly. Important elements are:

- Sleep on average 7 hours a night. Research has shown that our body needs at least 30% of a day to recover. This recovery takes place mainly during the night for many people.
- Movement. Sufficient physical activity every day (walking, cycling, swimming, dancing, yoga, etc).

Medication
When you start your supplement program, it is important that you do not stop taking any medications while taking them. However, as your metabolism improves, various medications can be tapered off step by step. However, it is important that you do this after consulting your doctor.

How to follow the supplement program
The recommendations in the program are based on the HMA results. For best results, it is recommended to adhere to the program as advised. Do not mix morning, afternoon and evening prescriptions together.

- Supplements should be taken just before, during, or after a meal.
- If it is necessary to reduce the number of tablets per day, use the program twice or once a day, but keep the proportions the same.
- Heartburn support may be necessary in the event of bloating or gas formation. Do this in consultation with your therapist.
- Supplements can be stored in a sealed bag or special vitamin box to avoid opening your jars every day.

[1] Disclaimer: These general advices do not take into account any other analyzes (allergy, tolerances, insulin sensitivity, intestinal health, thyroid function, etc.).

What can you expect

- In general, you will notice a change after 2-4 weeks after starting. Sometimes that is a deterioration and not an improvement. However, no one is the same and everyone reacts differently!
- The program is aimed at restoring your body energy. Many people will notice this too. If you notice this, don't immediately increase your work schedule or your social calendar pressure. It is better to use this amount of energy for further recovery and building.
- It is very possible that you will feel extra tired at first. This is characteristic of the new balance that your body is looking for. This reaction can also occur later, after you first felt better. We call this the self-healing capacity of the body that is restarted. Causes are inflammatory processes or the elimination of heavy metals through the blood to the organs and the skin. This can also be accompanied by headaches, diarrhea, constipation or stomach pain for several days. These reactions are normal as a result of the body's recovery.

Why minerals are advised when levels are high

Research has shown that replacement therapy (recommending minerals that are deficient according to the HMA) is not always an effective method in balancing your body. Instead, your supplement program takes into account the complex relationships and relationships that exist between minerals and between minerals / vitamins. It is therefore quite common that when a mineral that is deficient is not automatically advised, but that a mineral that is in surplus is advised. This approach is essential to the success of the program.

A repeat analysis

Doing a new Hair Mineral Analysis is advised after approx. 3 months. This new analysis is very important because the metabolic processes in your body will change as a result of your diet and the supplements. To accommodate these changes, it may be necessary to adjust the program to prevent progress from stopping. It is certainly not recommended to follow the program for more than 6 months without a new HMA.

15 Advised supplement program

Below is a supplement program that consists of balancing the mineral balance of the body. It sometimes happens that the client thinks this is quite a lot, also because of the costs. We do not advise you to run any part of the program as it will not work due to the dosages of different products. We recommend that you start, but with a lower dose per day. The client can then experience how the body reacts after a few weeks, and then decide, in consultation with you, to increase the dose per day.

	Morning	Noon	Evening
METABOLIC PAK			
Megapan	2	2	2
GLANDULARS			
Endo-Dren	1	1	1
Thyro Complex	1	1	1
DIGESTION			
Gb-3	1	1	1
MINERAL CHELATES			
Paramin	1	1	1
Limcomin	2	2	2
Endo-Pan	1	1	1
OTHER SUPPLEMENTS			
Fulvic Acid	1 liter diluted fulvic acid drink per day		
Or:			
Renamide	1	1	1
Selenium	1	1	1

The following section explains why nutritional balancing supplements are recommended:

Megapan is a specific multivitamin mineral product designed to stimulate the metabolic oxidation rate. Adjusting this is influenced by a number of different nutritional factors. Megapan puts a strain on the factors that now hinder metabolic speed.

Endo-Dren contains bovine adrenal nucleoproteins that, along with vital synergistic nutrients, support the recovery of normal adrenal response. Glandulars contain polypeptides, enzymes and nucleoproteins that have been shown to improve glandular function. This product is generally recommended for the slow and slow mixed oxidation rate.

Bio-Thyro is een glandular complex dat ontwikkeld is om de schildklier productie te ondersteunen. Het product bevat geen hormonen en bevat gevriesdroogde glandulars.

Gb-3 is a formula with bile acids and synergistic factors. Gb-3 improves bile secretion, aids in the removal of toxic metals (especially copper) from the liver. Bile acids can also have a laxative effect.

Paramin is formulated to provide the necessary balance of calcium and magnesium. Macromin offers these essential components in a highly absorbable form such as calcium and magnesium citrate and chelate. This product contains the supporting nutrient Boron for better absorption and utilization of these essential minerals.

Limcomin is a multi-nutrient formula designed to support and improve the immune system. Bio-Immune contains nutrients that are of great importance for the immune system. Limcomin is particularly suitable against all types of infections, both viral and bacterial. It is also excellent for low resistance symptoms.

Endo-Pan is a formula containing zinc, pantothenic acid and cysteine. Zinc is a critical activator and part of many enzymes. Pantothenic acid is part of Coenzyme A, which plays an important role in energy and stress management in the body. Endo-Pan has been developed to support the adrenal glands and stimulate Coenzyme A activity. Pantothenic acid, L-cysteine and zinc are important here.

Fulvic acid (Biomore) is a natural substance and part of the so-called 'Humic acids' (acids that are released during the composting of vegetable material). In its pure form it has great detox properties. Fulvic acid is easily tolerated by the body. It promotes the absorption of nutritional supplements and helps to remove heavy metals and other unwanted particles and compounds.

Renamide contains kidney nucleoproteins along with other specific synergistic nutrients. The product is recommended to further improve renal function and assist in the removal of toxic metals through the kidneys.

Selenium is often used for people with both fast and slow oxidation to aid in the detoxification of heavy metals, and in people with sympathetic dominant slow oxidation for normal thyroid hormone production and thyroid function.

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