Hompes Method

Lesson 28-
Hair Tissue Mineral Analysis
HTMA - Introduction

• As you saw in the previous presentation, clinical assessment of mineral levels is not clear cut. Different tissues can tell you different things about the body’s mineral status and even when you see a “high” or a “low” value, it doesn’t mean the body’s actual status matches the result.
HTMA - Introduction

• I also showed you how things can get even trickier when you throw in the concepts of metabolic individuality and metabolic typing because different metabolic types might need nutrients that seem contradictory to lab test results.
HTMA - Introduction

• For example in Ben’s case study, his blood work indicated a need for potassium and magnesium. But when he took these nutrients in standard supplemental doses, he felt worse. This was because his metabolic type imbalance (parasympathetic dominant) was further imbalanced by the nutrients, and he needed more calcium, phosphorus and zinc.
HTMA - Introduction

• Hair tissue mineral analysis (HTMA) is a great analysis tool because in comparison with blood and urine testing it’s relatively inexpensive. But as I alluded to in the last lesson, the interpretation of HTMA is not straightforward.
HTMA - Introduction

• HTMA doesn’t just give insight into mineral levels *per se*. It can also provide information on the stress response, thyroid and adrenal function, as well as various “hidden” factors such as copper toxicity.
HTMA - Introduction

• I learned how to use HTMA through Sheri Dixon, who back in 2003-4 was delivering metabolic typing training for Bill Wolcott. It was through the metabolic typing programme that I also learned how to properly perform coffee enemas, LVGB flushes, colon cleanses, etc.
• Surprise, surprise...opinions differ with regard to HTMA. Some people are very biased towards it, and some are lean more towards using blood and urine analysis for assessing mineral status.
HTMA - Introduction

• One of the guys who’s pro-HTMA is Dr. Lawrence Wilson, MD. His work on HTMA is extensive and his book and website are excellent tools that I recommend you add to your reading list.
HTMA - Introduction

- Unfortunately, Dr. Wilson is so biased towards HTMA that he dismisses a whole bunch of other assessment tools that I know for sure - from experience - are extremely helpful. But his work is extremely useful and I’ll draw upon some of it here.
HTMA - Introduction

• To prove a point, I’ve been working with a client for six months who was previously treated by a Dr. Wilson-trained practitioner. The protocol she’d been following made her feel absolutely awful. The practitioner offered no adjustment to the process and said “just keep going and push on through”. To me, this represents very poor clinical care.
HTMA - Introduction

- In my opinion it’s foolish and dangerous to be one-dimensional in your approach, especially when the human body is so darned complex! Learn in layers. Don’t believe a word I say!
HTMA - Labs

- Metametrix runs hair tissue mineral analysis, as do several other labs:
  - Genova?
  - Doctors’ Data?
  - Trace Elements, Inc.
  - Analytical Research
HTMA - Labs

• Of these, Trace Elements and Analytical Research are the two truly specialized HTMA labs and their reports are far more detailed and in depth than the others. I’ve used Trace Elements for more than ten years, though Dr. Wilson suggests Analytical Research is the strongest.
HTMA - Samples

- According to Dr. Wilson and other authorities on this subject, one of the key considerations when using HTMA is not to wash the hair before analysis. Unfortunately many labs still wash the samples (this is why Trace Elements and Analytical Research are deemed superior – they do not wash samples).
HTMA - Samples

• One problem with HTMA is that the samples are easily contaminated if people don’t rinse their hair properly after washing, or if their hair is treated or coloured (I put grey colouring in my hair each day so I can be like George Clooney…) Joking aside, the hair products can contain many different minerals that skew results, so it’s an important consideration.
HTMA - Samples

• Samples are taken from the 1-1.5 inches nearest to the scalp because this represents the last 2-3 month’s hair growth. In people with little or no scalp hair, pubic or axillary (armpit) hair can be used.
HTMA - Samples

• When I do a hair test I generally get my hairdresser to snip a small amount of hair from three or four different locations on my scalp so I don’t look like I have mange or alopecia. It’s a really simple, non-invasive process.
“Hair specimens can be useful in routine screening for toxic element exposure. A specimen composed of one and one half inches of hair closest to the scalp gives information about the past three months of exposure. Keratin, which is rich in sulfur-containing cysteine residues, is the major component of hair. When elements circulating in blood reach the hair follicle, they bind with high affinity to keratin, becoming trapped in the extruded shaft of hair. Hair concentrates toxic metals at least 10-fold above concentrations found in blood. When exogenous metal contamination is excluded, hair is described in toxicology textbooks as a very useful specimen for assessing many toxic elements.”

“Levels of toxic elements in hair indicate exposure to toxic elements in the last three months. Low levels of toxic elements imply that the toxic element is not high in the person’s immediate environment. However, low levels in hair do not guarantee that toxic elements are uninvolved in the patient’s symptoms because toxic elements can be stored in tissues. High levels of nutrient elements found in hair may be due to supplementation or abnormal homeostasis. High levels of some nutrient elements, such as calcium and magnesium, can suggest bone resorption due to chronic negative element balance. Hair element levels can be affected by exogenous contaminants such as hair treatments, shampoos, and dust.”

“Hair tissue mineral analysis or HTMA is a soft tissue mineral biopsy that uses hair as the sampling tissue. A biopsy is an analysis of a body tissue. Hair is considered a soft tissue, and hence hair analysis is a soft tissue biopsy. The test measures the levels of 20 or more minerals in the hair with an accuracy of plus or minus about 3%. This is about the same level of accuracy as most blood tests, or a little better.”

"Hair makes an excellent biopsy material for many reasons:

– Sampling is simple and non-invasive.
– Hair is a stable biopsy material that remains viable for years, if needed, and requires no special handling.
– Mineral levels in the hair are about ten times that of blood, making them easy to detect and measure accurately in the hair.
– Hair is a fairly rapidly growing tissue.
– The body often throws off toxic substances in the hair, since the hair will be cut off and lost to the body."
HTMA – The Science & Theory

— “Mineral levels are kept relatively constant in the blood even when pathology is present. Hair mineral values often vary by a factor of ten or much more, making measurement easier and providing a tremendous amount of accurate knowledge about the cells and the soft tissue of our bodies.

— Toxic metals are easier to detect in the hair than in the blood. They are not found in high concentrations in the blood except right after an acute exposure. However, most tend to accumulate in the soft tissues such as the hair, as the body tries to move them to locations where they will do less damage.”
“Hair testing provides a long-term reading, while blood tests and urine tests provide a more instantaneous reading of the body. Both types of readings have value in some circumstances. For example, blood tests can vary from hour to hour - diet, activities, time of day, hormones. This is beneficial in some instances, but is less helpful when seeking an overall metabolic reading. The mineral content of the blood is also kept fairly constant. These problems are not present with hair testing. At times, of course, an instantaneous reading such as the blood provides is needed, especially in emergencies.”
Hair is a non-essential, excretory, storage, soft tissue of the body. This causes the body to deposit dangerous toxic metals here more than in most other tissues of the body. It also means that the readings obtained from hair will be different than, for example, a DMPS challenge test, and often more accurate to measure what is in the body.

Finally, advancements in computer-controlled mass spectrometry and other technologies have rendered the hair mineral biopsy an extremely cost-effective, accurate and reliable test when it is performed well.
When properly performed and interpreted, I have found hair mineral analysis is an invaluable screening tool for evaluating nutritional status and general biochemistry. Few doctors or other practitioners understand it well. Most of the laboratories do not understand it well at all. I was fortunate to spend 14 years apprenticing with Dr. Paul C. Eck, a pioneer in this field and founder of Analytical Research Laboratories.
“If mineral analysis did not work well, I would have stopped using it years ago, as there are many methods of nutritional assessment. I continue to use it because, when done correctly, the results are superb.”
"Regarding the accuracy of the test, mineral analysis is a standard spectroscopic analysis for which the technology has been known for some 75 years or more. The test is highly repeatable and accurate. All commercial laboratories are licensed and inspected annually by the federal government. They are given blind samples to run. If they do not meet stringent criteria for accuracy, they are not allowed to operate."
“The United States Environmental Protection Agency published a 300-page review of hair analysis in which they reviewed 400 studies of hair analysis. Based on this review, they concluded that hair analysis is a "meaningful and representative tissue for biological monitoring for most of the toxic metals". ("Toxic Trace Metals in Human and Mammalian Hair and Nails", EPA-600 4.79-049, August 1979, US Environmental Protection Agency, Research and Development.)”
HTMA – How We Use It in HM

• Because HTMA is inexpensive, we add it to our consulting package as a free bonus to our clients when they sign up for a 90-day consulting package. We’d retail an HTMA at around £60 / $90 and the analysis cost from the lab to us is around £20 / $30.
The HTMA results add a lot of information up front in the programme (e.g. mineral deficiency, stress, adrenal, thyroid function) and can provide excellent rationale and guidance regarding the need for additional tests that will help our clients. *I don’t often base protocols on the results of HTMA alone.*
HTMA - Results

- I can only discuss the interpretation of HTMA results from Trace Elements as that’s the only lab I’ve used extensively. Analytical Research report the same or similar markers and Dr. Wilson’s work is based on this lab.
HTMA - Results

• HTMA results are split into four main categories:

1. Nutrient mineral levels
2. Toxic element levels
3. Significant ratios (nutrient mineral ratios)
4. Toxic ratios (not considered in this lesson)

* Note: the ratios are not provided in Metametrix testing, which is one reason I don’t use them.
HTMA - Results

• It’s important to consider all the sections when interpreting the results. The nutrient ratios, for example, can provide clues about hidden toxicities and deficiencies that are not apparent by simply looking at the nutrient element/mineral levels themselves.
HTMA - Results

- A low level of any given nutrient may reflect an actual physical deficiency (quantitative). But a high result can also reflect a deficiency of utilisation (qualitative). Here, there’s plenty of a given nutrient but the body can’t use it. The qualitative deficiency comes into light the more you study metabolic typing, should you choose to do so.
A consideration worth noting is the Wilson purports to be able to identify a person’s metabolic type just by looking at certain element levels and relationships in the HTMA, which Wolcott refutes. I firmly take Wolcott’s side in this argument. In Hompes Method, we ignore the metabolic type reported by the hair test lab, irrespective of which lab it is.
## HTMA – Nut & Tox Elements Sample 1

### Nutritional Elements

**High**

- Ca: 59
- Mg: 3.5
- Na: 7
- K: 3
- Cu: 16
- Zn: 16
- P: 0.8
- Fe: 0.6
- Mn: 0.05
- Cr: 0.04
- Se: 0.04
- B: 0.02
- Co: 0.01
- Mo: 0.01
- S: 4176

**Low**

- Sb: 59
- U: 3.5
- As: 7
- Be: 3
- Hg: 16
- Cd: 16
- Pb: 0.8
- Al: 0.6
- N/A: 0.05
- 0.04
- 0.04
- 0.02
- 0.01
- 0.01

### Toxic Elements

**High**

- Sb: 0.025
- U: 0.0596
- As: 0.070
- Be: 0.004
- Hg: 0.63
- Cd: 0.049
- Pb: 1.1
- Al: 6.3

- Sb: 0.021
- U: 0.0510
- As: 0.060
- Be: 0.003
- Hg: 0.54
- Cd: 0.042
- Pb: 0.9
- Al: 5.4

- Sb: 0.018
- U: 0.0425
- As: 0.050
- Be: 0.003
- Hg: 0.45
- Cd: 0.035
- Pb: 0.8
- Al: 4.5

- Sb: 0.014
- U: 0.0340
- As: 0.040
- Be: 0.002
- Hg: 0.36
- Cd: 0.028
- Pb: 0.6
- Al: 3.6

- Sb: 0.011
- U: 0.0255
- As: 0.030
- Be: 0.002
- Hg: 0.27
- Cd: 0.021
- Pb: 0.5
- Al: 2.7

- Sb: 0.007
- U: 0.0170
- As: 0.020
- Be: 0.001
- Hg: 0.18
- Cd: 0.014
- Pb: 0.3
- Al: 1.8

**Reference Range**

- Ca: 22
- Mg: 2.0
- Na: 4
- K: 2
- Cu: 0.9
- Zn: 10
- P: 11
- Fe: 0.5
- Mn: 0.010
- Cr: 0.02
- Se: 0.03
- B: 0.002
- Co: 0.001
- Mo: 0.001
- S: 2651

- Sb: 0.0008
- U: 0.004
- As: 0.001
- Be: 0.10
- Hg: 0.001
- Cd: 0.1
- Pb: 0.3
- Al: 0.3

**Hompes Method**
HTMA – Nut & Tox Elements Sample 2

**NUTRITIONAL ELEMENTS**

- Calcium (Ca): 27
- Magnesium (Mg): 4.4
- Sodium (Na): 36
- Potassium (K): 19
- Copper (Cu): 1.0
- Zinc (Zn): 16
- Phosphorus (P): 16
- Iron (Fe): 1.0
- Manganese (Mn): 0.045
- Chromium (Cr): 0.08
- Selenium (Se): 0.08
- Boron (B): 0.38
- Cobalt (Co): 0.001
- Molybdenum (Mo): 0.004
- Sulfur (S): 4440

**TOXIC ELEMENTS**

- Antimony (Sb): N/A
- Uranium (U): 0.008
- Arsenic (As): 0.014
- Beryllium (Be): 0.001
- Mercury (Hg): 0.12
- Cadmium (Cd): 0.001
- Lead (Pb): 0.1
- Aluminum (Al): 0.7

**REFERENCE RANGE**

- Calcium (Ca): 22 - 2.0 - 4 - 2 - 0.9 - 10 - 11 - 0.5 - 0.010 - 0.02 - 0.001 - 0.000 - 0.01 - 2651
- Magnesium (Mg): 172 - 20.0 - 68 - 46 - 6.9 - 32 - 29 - 2.7 - 0.14 - 0.33 - 1.80 - 0.005 - 0.013 - 7126
- Sodium (Na): 135 - 15.5 - 52 - 35 - 5.4 - 27 - 25 - 2.2 - 0.190 - 0.11 - 0.26 - 1.36 - 0.004 - 0.011 - 6231
- Potassium (K): 97 - 11.0 - 36 - 24 - 3.9 - 21 - 20 - 1.6 - 0.130 - 0.08 - 0.18 - 0.91 - 0.003 - 0.008 - 5336
- Copper (Cu): 22
- Zinc (Zn): 4.4
- Phosphorus (P): 36
- Iron (Fe): 19
- Manganese (Mn): 1.0
- Chromium (Cr): 16
- Selenium (Se): 16
- Boron (B): 1.0
- Cobalt (Co): 0.045
- Molybdenum (Mo): 0.08
- Sulfur (S): 0.08
- Antimony (Sb): N/A
- Uranium (U): 0.008
- Arsenic (As): 0.014
- Beryllium (Be): 0.001
- Mercury (Hg): 0.12
- Cadmium (Cd): 0.001
- Lead (Pb): 0.1
- Aluminum (Al): 0.7
# HTMA – Nut & Tox Elements Sample 3

## Nutritional Elements

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## Toxic Elements

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**REFERENCE RANGE**

- **Low**: Calcium (Ca), Magnesium (Mg), Sodium (Na), Potassium (K), Copper (Cu), Zinc (Zn), Phosphorus (P), Iron (Fe), Manganese (Mn), Chromium (Cr), Selenium (Se), Boron (B), Cobalt (Co), Molybdenum (Mo), Sulfur (S)
- **High**: Antimony (Sb), Uranium (U), Arsenic (As), Beryllium (Be), Mercury (Hg), Cadmium (Cd), Lead (Pb), Aluminum (Al)

**HIGH**

- Calcium (Ca): 7126
- Magnesium (Mg): 6231
- Sodium (Na): 5336
- Potassium (K): 2651
- Copper (Cu): 172
- Zinc (Zn): 135
- Phosphorus (P): 97
- Iron (Fe): 22
- Manganese (Mn): 32
- Chromium (Cr): 21
- Selenium (Se): 20
- Boron (B): 16
- Cobalt (Co): 13
- Molybdenum (Mo): 10
- Sulfur (S): 7

**REFERENCE RANGE**

- Antimony (Sb): 0.0038
- Uranium (U): 0.003
- Arsenic (As): 0.001
- Beryllium (Be): 0.004
- Mercury (Hg): 0.01
- Cadmium (Cd): 0.1
- Lead (Pb): 4.4
HTMA – Nut & Tox Elements Sample 4

NUTRITIONAL ELEMENTS

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TOXIC ELEMENTS

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# HTMA – Nut & Tox Elements Sample 6b

## Nutritional Elements

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## Toxic Elements

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<td>Lead (Pb)</td>
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<tr>
<td>Aluminum (Al)</td>
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## Hompeses Method

*Values are in ppm.*
HMTA and Heavy Metals

• A note on heavy metals: autistic kids generally have low or no hair mercury. “Normal” kids tend to have mercury showing up in their hair and this is because they can excrete it, whereas autistic kids have trouble so doing. This illustrates why it’s unwise to take an HTMA result on face value when considering heavy metals.
HMTA and Heavy Metals

• Remember that heavy metals are sequestered deep inside tissue storage depots and, as such, may not show up in hair until a nutritional balancing / detoxification programme has been commenced.

• * See Georgiou’s paper in the resources section for some good examples of this phenomenon.
HTMA – Significant Ratios

• The problem with just considering the nutrient elements is that we don’t really know whether high levels are truly high or if low levels are truly low. I would suggest that low levels are truly low if they are all on the low side, as in some of the examples I’ve just shown you.
HTMA – Significant Ratios

• Nutrient element ratios can provide information about:
  – Autonomic dominance (para vs. sym)
  – Stress adaptation
  – Thyroid function
  – Adrenal function
  – Copper toxicity / hidden copper toxicity
  – Blood sugar regulation
  – Hidden heavy metal toxicity
  – Infections
HTMA – Significant Ratios

• In this training I simply don’t have time to go into the ins and outs of all these ratios and hidden toxicities. I recommend you do your own research using Dr. Wilson’s book and website materials. But let’s take a good look at the significant ratios and some of the toxicity markers.
HTMA – Significant Ratios

- This is what the “Significant Ratio” graph looks like:
  - Ca/P
  - Na/K
  - Ca/K
  - Zn/Cu
  - Na/Mg
  - Ca/Mg
  - Fe/Cu

### Significant Ratios

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<th>Na/K</th>
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<td>4.00</td>
<td>2.00</td>
<td>3.00</td>
<td>0.20</td>
</tr>
<tr>
<td>LOW</td>
<td>0.90</td>
<td>0.90</td>
<td>0.90</td>
<td>0.90</td>
<td>0.90</td>
<td>0.90</td>
<td>0.90</td>
</tr>
</tbody>
</table>
The Na:K ratio was termed “the vitality ratio” by Dr. Paul Eck, who conducted a lot of research on HTMA:

- A “normal” ratio is 2.2:1 and 4:1 (note these numbers are based on Analytical Research, not Trace Elements)
HTMA – Na:K Ratio

• The Na:K ratio is used alongside the research findings of Hans Selye, who studies the “stress response” in detail for many years. Selye’s results led him to write extensively about what he called the “General Adaptation Syndrome.”
HTMA – Na:K Ratio

• The “alarm phase” is a period of acute stress. At this point the body has a lot of “fight” left and is actively engaged in an attempt to adapt to the stress. This is believed to correlate to a high Na/K ratio. The reasoning behind this is that sodium is believed to reflect adrenal medulla activity, which under emergency conditions secretes aldosterone, which in turn causes sodium retention.
HTMA – Na:K Ratio

• The “resistance stage” is the period where the acute stress is on the verge of becoming chronic stress. At this point, the body is still fighting the stress, but it is neither winning nor losing; it could go either way. The stress may be resolved or it may become chronic.
During the exhaustion phase, believed to be represented by a Na/K inversion - the adrenals are believed to have begun to burn out and weaken. As the adrenal medulla slows down, sodium falls in relation to potassium. As stress becomes chronic, sodium falls further and goes into an inverted relationship to potassium.
HTMA – High Na:K Ratio

• A high Na:K ratio is associated with acute stress, inflammation, and possibly symptoms associated with zinc and/or magnesium deficiency.

• The main causes of a Na:K ratio are excessive aldosterone secretion due to stress or anger, toxic metals or a zinc and magnesium deficiency.

• Any stressor can lead to an increased Na:K ratio, which indicates adrenal strength is present (i.e. not adrenal exhaustion).
HTMA – Low Na:K Ratio

• Low Na:K indicates serious maladaptation to stress and low vitality levels (adrenal fatigue and poor energy production).

• Represents adrenal fatigue or exhaustion, even if the individual Na and K readings in the nutrient elements section look normal.
HTMA – Na/Mg Ratio

• The Na:Mg ratio is known as the “adrenal ratio.”

• Sodium and magnesium tend to be antagonistic - as one goes up the other goes down. The ratio often gives a good indication of adrenal activity.

• The ideal ratio is 4.17:1.

• As the ratio elevates, it reflects an excessive adrenal effect, while a low ratio indicates under activity.
HTMA – Na/Mg Ratio

- The ratio won’t perfectly with blood or saliva tests for adrenal hormones because the latter measures hormones or their metabolites in the blood or saliva. The hair test measures tissue effect.
The snapshot below is Dr. Wilson’s interpretation of the Na/Mg ratio.

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>16+</td>
<td>Extremely overactive adrenals 50% or more energy loss</td>
</tr>
<tr>
<td>8 - 16</td>
<td>Moderate excessive adrenals 25-50% energy loss</td>
</tr>
<tr>
<td>4.17 - 8</td>
<td>Mild excessive adrenal activity 10-25% energy loss</td>
</tr>
<tr>
<td>4.17</td>
<td>IDEAL 100% energy</td>
</tr>
<tr>
<td>2 - 4.17</td>
<td>Mild sluggish adrenal activity 10-25% energy loss</td>
</tr>
<tr>
<td>1 - 2</td>
<td>Moderate sluggish adrenals 25-50% energy loss</td>
</tr>
<tr>
<td>Below 1</td>
<td>Adrenal Insufficiency 50% or more energy loss</td>
</tr>
</tbody>
</table>
HTMA – Na/Mg Ratio

- At this juncture, I’d like to point out that there’s even more detail than this in Wilson’s work, which will be summarized in the Interpretive Guide document. It’s very advanced work, includes mental, emotional and spiritual correlations with the ratios, and isn’t really part of the core Hompes Method programme. Nevertheless it’s fascinating work.
The Ca:Mg ratio has to do specifically with carbohydrates in the diet – it’s known as the “blood sugar ratio.”

The ideal ratio is around 4 to 9.5:1, with a tighter range of about 5 to 8 for optimum health.

Calcium increases insulin secretion whereas magnesium inhibits its secretion.
HMTA – Ca/Mg Ratio

• The snapshot below is Dr. Wilsons’s interpretation of the Ca/Mg ratio:

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>12+</td>
<td>Diabetes</td>
</tr>
<tr>
<td>10-12</td>
<td>Hyperglycemia</td>
</tr>
<tr>
<td>6.67-10</td>
<td>Good</td>
</tr>
<tr>
<td>6.67</td>
<td>IDEAL</td>
</tr>
<tr>
<td>3.3-6.67</td>
<td>Good</td>
</tr>
<tr>
<td>3-3.3</td>
<td>Hypoglycemia</td>
</tr>
<tr>
<td>1-3.3</td>
<td>Diabetes</td>
</tr>
</tbody>
</table>
HMTA – Ca/K Ratio

• The Ca/K ratio is called the “thyroid ratio” because of the vital role played by both Ca and K in thyroid function and metabolism.

• The ideal Ca:K ratio is around 4:1.

• High Ca:K will often indicate a trend toward hypothyroidism, with a low ratio indicating hyperthyroidism.
HMTA – Ca/K Ratio

• Calcium antagonizes the retention of potassium within the cell.

• Since potassium is necessary in sufficient quantity to sensitize the tissues to the effects of thyroid hormones, a high Ca:K ratio would suggest reduced thyroid function and/or cellular response to thyroxine.

• A high Ca:K ratio may not indicate a thyroid issue per se, but more a thyroid hormone metabolism problem.
HMTA – Ca/K Ratio

- Sometimes symptoms of hypothyroidism may be evident, but the hair test will show a hyperactive thyroid ratio.

- According to Dr. Kathleen Akin, for “Nutritional Correction”, it is prudent to follow the hair analysis indication.

- It may suggest autoimmune thyroid issues.
HTMA – Zn/Cu Ratio

- Copper must remain in balance with zinc - when imbalances occur, one is more prone to all infections, in particular fungal and yeast infections that are so common today.

- Using the zinc/copper ratio is a much more effective method of evaluating zinc and copper readings than considering either copper or zinc levels alone.
According to Andy Cutler and others, the symptoms of copper poisoning are similar to that of mercury toxicity and a significant number of people who think they have mercury issues actually have copper toxicity. Because this is an important factor in people’s symptoms, let’s cover it in a little detail.
HTMA – Zn/Cu Ratio

• According to Wilson, the copper level on a hair mineral analysis is NOT the best way to assess copper status. The reason is that copper does not often accumulate in the hair tissue and too many other factors can skew the reading.
“The hair copper level is a very unreliable indicator for copper toxicity. So is serum copper, serum ceruloplasmin, and many other tests because the copper can hide deep in the brain and the liver. A liver biopsy is a good indicator, but is a painful and somewhat invasive procedure.\textquoteleft\textquoteleft
There are three major copper imbalances:

- Excess copper / toxicity
- Copper deficiency
- Bio-unavailable copper
HTMA – Zn/Cu Ratio

• An excess of copper can contribute to many symptoms: e.g., depression, *spaciness*, paranoia, alternating moods, anxiety, panic, fearfulness, schizophrenia, phobias, etc. However, people may have any or all the above signs and symptoms of a copper toxicity and yet not have a high tissue copper level on a tissue mineral test.
HTMA – Zn/Cu Ratio

• It is absolutely necessary to consider the Zn:Cu ratio in an HTMA. The ideal Zn:Cu ratio is 8:1. If an individual's Zn:Cu ratio is below 6:1, a copper toxicity must be considered as a cause of the above mentioned signs and symptoms.
The snapshot below is Dr. Wilson’s’s interpretation of the Zn/Cu ratio:

<table>
<thead>
<tr>
<th>Ratio:</th>
<th>Trends:</th>
</tr>
</thead>
<tbody>
<tr>
<td>16+</td>
<td>Severe copper deficiency or bio-unavailability of copper</td>
</tr>
<tr>
<td>8 - 16</td>
<td>Copper deficiency or bio-unavailability</td>
</tr>
<tr>
<td>8</td>
<td>IDEAL</td>
</tr>
<tr>
<td>4 - 8</td>
<td>Copper toxicity</td>
</tr>
<tr>
<td>2 - 4</td>
<td>Severe copper toxicity - excessive breakdown, emotional instability, zinc deficiency problems such as impotence, slow healing, loss of taste, smell, appetite, and hair loss</td>
</tr>
</tbody>
</table>
HTMA – Zn/Cu Ratio

• Determining copper status is not always plain sailing because copper may appear low on an HTMA even when toxicity is present; hidden copper toxicity markers include:
  – Most slow oxidisers and very slow oxidisers (MT principles)
  – Calcium level greater than about 70mg%.
  – Magnesium greater than around 10mg%.
  – Potassium less than 4mg%.
  – Zinc level less than 13mg%.
HTMA – Zn/Cu Ratio

• Hidden copper toxicity markers, continued:
  – Zinc greater than about 20 mg% is often, but not always is a hidden copper indicator.
  – Copper level less than 1.5 mg% if usually an excellent indicator.
  – Mercury level greater than 0.03 mg%.
  – Slow oxidation with a copper level less than 1.0 mg% (MT)
  – Calcium /potassium ratio greater than 10:1.
  – Sodium/potassium ratio less than about 2.5:1.
  – Phosphorus less than about 13 mg%.
HMTA – Zn/Cu Ratio

• If you spot likely copper imbalances in the HMTA, it’s wise to use other tests to put more pieces in the jigsaw puzzle. Andy Cutler recommends:

  – RBC copper
  – Urine copper
  – Stool copper
“In copper intoxication syndromes, copper will be elevated in red blood cells, in other tissues not generally accessible for analysis (e.g. liver and brain), in hair and possibly in urine. It may be normal in serum. There may or may not be some copper excretion in the feces via the bile.”

Cutler – Amalgam Illness, pages 53, 66 and 99.
HMTA – Zn/Cu Ratio

• Stool testing for nutrient and toxic elements (Doctor’s Data) is recommended because 96% copper is excreted via bile and intestinal secretions. If fecal copper is low or absent, the person isn’t getting rid of copper properly (this could be a condition called Wilson’s Disease – not the Wilson who wrote the HTMA book).
**HMTA – Zn/Cu Ratio**

- **Cutler’s steps to reduce copper include:**
  - Reducing copper-rich foods.
  - Increasing vitamin C, zinc and molybdenum intake, which all antagonise copper absorption.
  - Optimising vitamin D, which increases metallothionein (increases copper excretion).
  - Lipoic acid can be used to remove copper but only in very specific circumstances.
HMTA – Zn/Cu Ratio

• Wilson’s steps to reduce copper include:
  − Copper antagonists such as zinc, sulfur compounds, manganese, selenium, iron.
  − B<sub>1, 3, 6</sub>
  − Dolic acid, inositol, choline.
  − Vitamins C and E.
  − Glutathione.
  − These are chemicals that compete with copper for absorption and utilization.
  − Vitamin C causes copper to be chelated and removed from liver and brain reservoirs.
• Remember from the previous lesson that other tests for giving insight into copper deficiency include:
  – Elevated HVA:VMA ratio in organic acids (>4)
  – CBC:
    • Low uric acid
    • Low HCT
    • Low HBG
    • Low RBCs
  – We’ll discuss specific markers in hair mineral analysis that may reveal hidden copper toxicity.
In my opinion, if you suspect someone is copper toxic and possibly struggling with heavy metals, it’s best to refer out to an experienced practitioner who knows how to deal with the problem. The topic is discussed further in the Interpretive Guide summary.
## HMTA – Significant Ratios Sample 1

### Significant Ratios

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ca/P</td>
<td>3.69</td>
</tr>
<tr>
<td>Na/K</td>
<td>2.33</td>
</tr>
<tr>
<td>Ca/K</td>
<td>19.67</td>
</tr>
<tr>
<td>Zn/Cu</td>
<td>20.00</td>
</tr>
<tr>
<td>Na/Mg</td>
<td>2.00</td>
</tr>
<tr>
<td>Ca/Mg</td>
<td>16.86</td>
</tr>
<tr>
<td>Fe/Cu</td>
<td>0.75</td>
</tr>
</tbody>
</table>

**Legend:**
- **High:** 4.60, 4.40, 8.20, 16.00, 8.00, 15.00, 2.30
- **Acceptable:** 3.60, 3.40, 6.20, 12.00, 6.00, 11.00, 1.60
- **Low:** 2.60, 2.40, 4.20, 8.00, 4.00, 7.00, 0.90
- **Very Low:** 1.60, 1.40, 2.20, 4.00, 2.00, 3.00, 0.20
## HMTA – Significant Ratios Sample 2

### Significant Ratios

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Ca/P</th>
<th>Na/K</th>
<th>Ca/K</th>
<th>Zn/Cu</th>
<th>Na/Mg</th>
<th>Ca/Mg</th>
<th>Fe/Cu</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>4.60</td>
<td>4.40</td>
<td>8.20</td>
<td>16.00</td>
<td>8.00</td>
<td>15.00</td>
<td>2.30</td>
</tr>
<tr>
<td>ACCEPTABLE</td>
<td>3.60</td>
<td>3.40</td>
<td>6.20</td>
<td>12.00</td>
<td>6.00</td>
<td>11.00</td>
<td>1.60</td>
</tr>
<tr>
<td>LOW</td>
<td>2.60</td>
<td>2.40</td>
<td>4.20</td>
<td>8.00</td>
<td>4.00</td>
<td>7.00</td>
<td>.90</td>
</tr>
<tr>
<td></td>
<td>1.60</td>
<td>1.40</td>
<td>2.20</td>
<td>4.00</td>
<td>2.00</td>
<td>3.00</td>
<td>.20</td>
</tr>
</tbody>
</table>

|       | 6.38 | 2.00 | 34.00 | 20.77 | 1.25  | 21.25 | .85   |

*Note: The ratios are measured values for Ca/P, Na/K, Ca/K, Zn/Cu, Na/Mg, Ca/Mg, and Fe/Cu.*
# HMTA – Significant Ratios Sample 4a

## Nutritional Elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Ca</th>
<th>Mg</th>
<th>Na</th>
<th>K</th>
<th>Cu</th>
<th>Zn</th>
<th>Fe</th>
<th>Mn</th>
<th>Cr</th>
<th>Se</th>
<th>B</th>
<th>Co</th>
<th>Mo</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>102</td>
<td>7.3</td>
<td>25</td>
<td>19</td>
<td>5.4</td>
<td>16</td>
<td>14</td>
<td>.016</td>
<td>.04</td>
<td>.06</td>
<td>.014</td>
<td>.009</td>
<td>.002</td>
<td>3988</td>
</tr>
</tbody>
</table>

## Toxic Elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Sb</th>
<th>U</th>
<th>As</th>
<th>Be</th>
<th>Hg</th>
<th>Cd</th>
<th>Pb</th>
<th>Al</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference Range</td>
<td>N/A</td>
<td>.0028</td>
<td>.003</td>
<td>.001</td>
<td>.05</td>
<td>.001</td>
<td>.2</td>
<td>.3</td>
</tr>
</tbody>
</table>

### Notes
- Calcium (Ca)
- Magnesium (Mg)
- Sodium (Na)
- Potassium (K)
- Copper (Cu)
- Zinc (Zn)
- Iron (Fe)
- Manganese (Mn)
- Chromium (Cr)
- Selenium (Se)
- Boron (B)
- Cobalt (Co)
- Molybdenum (Mo)
- Sulfur (S)
- Antimony (Sb)
- Uranium (U)
- Arsenic (As)
- Beryllium (Be)
- Mercury (Hg)
- Cadmium (Cd)
- Lead (Pb)
- Aluminum (Al)
## HMTA – Significant Ratios Sample 4b

### Significant Ratios

<table>
<thead>
<tr>
<th>Ratios</th>
<th>Ca/P</th>
<th>Na/K</th>
<th>Ca/K</th>
<th>Zn/Cu</th>
<th>Na/Mg</th>
<th>Ca/Mg</th>
<th>Fe/Cu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>7.29</td>
<td>1.32</td>
<td>5.37</td>
<td>2.96</td>
<td>3.42</td>
<td>13.97</td>
<td>0.13</td>
</tr>
<tr>
<td>Acceptable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The table above represents the significant ratios for various elements. The values are measured in the specified units.
• You can see from this short presentation that HTMA is a very useful tool. You can also see that interpreting the information isn’t as straightforward as it may seem.
HTMA & Hompes Method

• In Hompes Method, we use HTMA to:
  – Look for flat mineral levels
  – Get indications of heavy metal toxicity
  – Check ratios to determine the need for further testing that might include:
    • Glucose/insulin levels, glucose tolerance tests.
    • Nutrient and toxic elements in RBCs and urine (esp. zinc/copper)
    • Endocrine testing – adrenals, thyroid, sex hormones
HTMA & Hompes Method

- HTMA’s can also be excellent tools for helping your clients and patients understand some of the imbalances they have, and the extent of those imbalances. This can help motivate and inspire them to change.

*Don’t use the HTMA to diagnose anything*
Finally, the HTMA tests are excellent tools for re-testing. With Trace Elements, a client/patient doesn’t need to pay for the first retest, so the first two tests are provided for the cost of the first one only.
HTMA & Hompes Method

• On a deeper level, HTMA can be used to help gain insight into mental, emotional, spiritual and life “issues” that might need to be addressed if they are to truly break through and reach their health goals.
HTMA - Key Reading & Resources

• The Hompes Method Basic HTMA Interpretive Guide is an essential tool as it will give you what you need to interpret HTMA in enough detail to know what to do and when to refer out.

• Consider Dr. Wilson’s book.

• Consider Andy Cutler’s book on HTMA.

• Consider doing the Metabolic Typing courses.
Thank You!

- Thanks a million for tuning in. I appreciate your time and I appreciate you choosing me as one of your teachers. In the next lesson we’ll look at how we test for vitamins and other metabolic markers.