Hair Test Interpretation Tips:

Calcium

High Hair Calcium:

- usually indicates that calcium is leaving the bones and accumulating in the soft tissues of the body
- high calcium is associated with a slow oxidation rate
- good indicator of hidden copper toxicity
- high calcium on a retest often means the body is eliminating excess calcium

Low Hair Calcium:

- a low calcium level usually means calcium is being lost in the urine
- associated with fast oxidation rate – alarm stage of stress
- often associated with copper deficiency

Magnesium

High Hair Magnesium:

- often associated with a SLOW oxidation rate, fatigue and depression.
- a high magnesium level often indicates that magnesium is being lost through the hair, resulting in deficiency symptoms such as anxiety and hyper-irritability.

Low Hair Magnesium:

- often associated with a FAST oxidation rate, anxiety, irritability and high-strung personality.

Sodium

- Sodium is referred to as the “volatility” mineral.

Low Hair Sodium:

- excellent indicator of impaired adrenal gland activity
- very low sodium is indicative of exhaustion

High Hair Sodium:

- indicative of excessive adrenal gland activity
- often indicates excitability and fast oxidation
- sodium levels can be elevated by toxic metals, especially ***cadmium***

Potassium

- Potassium is known as the “follow-through” mineral.

High Hair Potassium:

- indicates high sugar and glucocorticoid levels.
- very high potassium can be a potassium loss due to excessive breakdown of body cells.

Low Hair Potassium:

- indicates adrenal gland exhaustion.
- very low potassium is associated with allergies, fatigue, low blood sugar, sweet cravings, and low blood pressure.

Iron

- Iron is referred to as the strength mineral

High Hair Iron:

- often associated with feelings of anger and hostility
- more often seen in fast oxidation
- often associated with high aluminum levels
- can be due to an iron loss due to destruction of body cells
- iron toxicity can be due to iron cookware or excessive iron in drinking water

Low Hair Iron:

- most often associated with a slow oxidation rate
- common to see iron levels around 1.0 mg%
- low hair iron does not necessarily indicate anemia
- low iron often seen with symptoms of fatigue
- taking iron tablets will not necessarily raise iron levels

Copper

- Bio-unavailable copper: Often copper status can be tricky to assess.
- Copper may be present, but unavailable for use in the body.
- This occurs any time adrenal gland activity is low.
- Copper and Oxidation Type: Fast oxidizers generally are deficient in copper
- Copper and Oxidation Type: Slow oxidizers usually have either high copper or bio-unavailable copper.
- Hidden Copper Toxicity: Copper is often normal on hair tests, but may actually be locked in body tissues.
- **Test indicators of a hidden copper imbalance are:**
  - Calcium level greater than 75 mg%
  - Potassium level less than 3 mg%
  - Sodium/potassium ratio less than 2.2:1
- **Mercury toxicity often indicates a hidden copper toxicity**
- Copper level less than 1.0 mg%
- Zinc/copper ratio less than 6:1

Manganese

- Manganese is called the maternal mineral because manganese-deficient animals cease to care for their young.

High Hair Manganese:

- May be due to manganese toxicity derived from drinking water containing excessively high levels of manganese.

Low Hair Manganese:

- Low hair manganese levels are extremely common. However, if the manganese level is below .03 mg% it is considered very low.
- Low manganese usually correlates with slow oxidation and low energy levels.

Zinc

- Zinc is considered a “masculine” mineral, because of its importance in the formation of male sexual hormones.

High Hair Zinc:

- An elevated zinc level is commonly due to a loss of zinc from the body tissues.
- In these cases, zinc supplements will often be recommended.
- Zinc levels may appear high to help compensate for copper toxicity.
- Thus high zinc can be a tip off of a hidden copper toxicity.
- Use of *Head and Shoulders* shampoo occasionally results in an elevated zinc reading.
- Cadmium toxicity can cause a zinc reading to appear high.

Low Hair Zinc:

- Zinc will often read low if the sodium/potassium ratio is less than 2.5:1.
- In this case, it is not always wise to give much zinc.
- Zinc is commonly low in “fast” oxidizers.
- Very low zinc levels are often associated with emotional instability and with problems of growth and development in children.

Chromium

High Hair Chromium:

- a high chromium level is often indicative of a loss of chromium through the hair, and is frequently caused by an iron toxicity or another mineral imbalance problem.

Low Hair Chromium:

- supplementing chromium when chromium reading is low, is frequently helpful in correcting symptoms of fatigue, or sugar and carbohydrate intolerance.
- excessive iron intake is a frequent cause of both high and low chromium levels.

Selenium

High Hair Selenium:

- can be due to the use of shampoos containing selenium
- may indicate a loss of selenium through the hair

Low Hair Selenium:

- May be due to dietary deficiency, which is relatively common, especially among those who eat refined foods
- Selenium may be given to help prevent or correct cadmium, mercury, or arsenic toxicity.
- Selenium is an anti-oxidant and may be given to help protect against free radical damage.
- Note that excessive selenium supplementation may be toxic (RDA 200 – 400 mcg daily).
- In addition, there is extensive research presently being conducted on the functions of **selenium and iodine** with regard to thyroid function and it is becoming clear that there is an interaction between the two that should be noted.

Phosphorus

High Hair Phosphorus:

- An elevated phosphorus level is frequently indicative of excessive protein breakdown of body tissues.
- As proteins break down, phosphorus is released.
- Phosphorus levels may increase temporarily as toxic metals are being eliminated in the course of a nutrition program.
- Very high phosphorus (greater than 25 mg%) can indicate a serious metabolic disturbance.

Note: Pubic hair samples often show elevated phosphorus readings. This is a characteristic of pubic hair.

Low Hair Phosphorus:

- A low phosphorus level is frequently associated with inadequate protein synthesis.
- Although most diets are adequate in phosphorus, those on low-protein diets or vegetarians may have a low phosphorus intake.
- Zinc is required for protein synthesis.
- Often a low phosphorus level is associated with a zinc deficiency, cadmium toxicity, or zinc loss.
- When these imbalances are corrected, the phosphorus level improves.

- A low phosphorus level may be due to poor digestion or assimilation of protein.
- This may be due to digestive enzyme deficiency, low hydrochloric acid level, or other factors.

Lead

- Children can also be born with elevated lead, passed through the placenta from their mothers.
- Diets deficient in calcium, magnesium, or iron increase lead absorption

Mercury

About the detection of mercury toxicity in HTMA – hair testing

- Both blood and hair have been used to detect mercury poisoning.
- In one study, hair levels generally correlated with blood levels.
- ***Hair levels are about 300 times higher than blood levels.***
- Copper toxicity and zinc deficiency are often associated with mercury toxicity.

Cadmium

- Cadmium data from blood have little diagnostic value.
- This is because cadmium is rapidly removed from the blood soon after it is ingested.
- Blood challenge tests can detect cadmium in the blood and arteries.
- Cadmium levels in hair show good correlation with cadmium levels in the kidneys.
- Often, however, several months of nutritional therapy and several hair tests are required before cadmium is revealed in the hair.
- Children today are commonly born with cadmium toxicity passed from mother to child via the placenta.

Arsenic

- Arsenic accumulates in the hair tissue
- Hair analysis is considered a valuable means of detecting arsenic toxicity.

Aluminum

- Hair aluminum levels appear to correlate well with bone levels of aluminum.
- Several hair tests may be needed before aluminum is revealed on the test.
- This is because the aluminum may be tightly bound within body tissues, and several months on a nutrition program may be required to mobilize the aluminum.

Molybdenum

- Molybdenum is a powerful copper antagonist.
- Most copper antagonists such as zinc displace copper.
- ***A unique property of molybdenum is that it binds or complexes directly with copper and facilitates its removal.***
- This enables copper to be removed from the body without the common side effects that often occur with copper removal.
- Another reason for this action is that molybdenum raises sodium, offsetting the sodium-lowering effect that occurs when copper is eliminated.
- Molybdenum absorption is antagonized by copper, sulfur, methionine and a high-protein diet.
- Molybdenum metabolism is antagonized by manganese, zinc and at times sulfur.

Lithium

- Lithium appears to lower sodium levels. This would correlate with the research by A. Frazier.
- The meaning of hair lithium levels is a topic of research.

Boron

- Significance in the hair is unknown.