

## **Hair Analysis and Metals Testing**

### **Why is metals testing important?**

The test is important for measuring toxic metals that can impede development and normal brain functioning, as well as measuring levels of minerals essential for normal growth and good health.

Toxic metals, such as mercury, lead, aluminum, cadmium, and arsenic, can affect development, neurological functioning and overall health. Today, with increasing pollution levels, presence of toxic metals in the environment is constantly growing. Chemical products, fertilizers, industrial paint, building materials, fish, silver dental fillings, and vaccines are just some of the sources of heavy metals in everyday life. Toxic metals may normally be present in the body in very low levels, but continuous exposure or metabolic abnormalities can cause accumulation of heavy metals in body tissues, and subsequently, in the brain. Many symptoms of heavy metals poisoning are identical to symptoms of neurological and psychiatric disorders, therefore, it is difficult or impossible to identify their cause without expert laboratory testing.

It is equally important to measure levels of minerals, which play an essential part in numerous physiochemical reactions within body cells. These reactions include receiving nutrients, filtering, emulsifying, absorbing vitamins, transforming energy and eliminating toxins, among many others. Toxic overload and metabolic imbalances favor minerals depletion.

Test results frequently show high heavy metal levels coupled with low mineral levels in people with developmental and neurological disorders, chronic fatigue, as well as apparently healthy individuals not feeling “a 100 percent”.

### **Hair testing:**

Ideal for initial evaluation because of easy sample collection procedures, accuracy and economic price. Blood, which contains high levels of metals immediately after exposure, transports them to body tissues and hair follicles well supplied by blood vessels. Toxic elements get incorporated and stored for several years in hair proteins evaluated in our test.

The hair test also provides exact ratios between nutrients and toxic metals. The results show levels of 38 toxic and essential elements, 5 ratios and comes with an individual interpretation.

### ***Hair Tissue Mineral Analysis***

Adapted from an article by George M. Tamari, Ph.D.

### **Summary**

**Hair tissue mineral analysis is a sophisticated laboratory technique used in preventive medicine for assessing mineral imbalances and toxicities in the human body. Utilizing this general diagnostic screening technique, information regarding the following nutritional minerals and toxic metals can be assessed with greater accuracy than by any other diagnostic method .**

*A mineral analysis should be considered for the following reasons:*

1. Marginal or very marked deficiencies of zinc, chromium and iron have been recognized widely in human populations in developed countries, indicating that your diet may not supply adequate amounts of all the minerals you require.
2. Many metabolic problems have been related to deficiencies of one or more essential trace elements, i.e., a deficiency of copper is seen in some forms of anemia, low levels of silicon may result in atherosclerosis, deficiencies of zinc may result in impaired wound healing, skin changes and growth retardation in children, deficiencies of chromium have been associated with blood sugar disturbances and insulin sensitivity, etc.
3. Trace mineral deficiencies may occur despite high dietary intakes due to sub-optimal nutrient absorption because of such factors as inappropriate stomach acid secretion, malabsorption, presence substances in the diet which inhibit mineral absorption, and interactions with other minerals.
4. Toxic metal accumulations in the body such as aluminum, arsenic, cadmium, lead and mercury may interfere with proper vitamin and mineral utilization and can induce unfavorable metabolic consequences, for example: neurological and psychomotor dysfunction from chronic lead intoxication, aluminum overload, and mercury toxicity, hypertension from excessive cadmium stores, and lead induced anemia.
5. Several investigators in Japan, Sweden, Canada and the U.S. have shown that concentrations of these toxic elements in the hair provide an accurate and relatively permanent record of exposure. They also found a good correlation between concentrations in hair and concentrations in internal organs.
6. Evidence shows that some birth defects may be related to nutritional factors and exposure to environmental toxic metals.
7. A multitude of signs and symptoms may be indicative of a mineral imbalance including fatigue, headaches, depression, irritability, nervousness, recurrent infections, muscle weakness and periodontal disease.
8. Many drugs can affect mineral metabolism including diuretics which influence sodium/potassium balance, oral contraceptives which affect zinc, copper, magnesium and iron levels.
9. There are over 3,000 enzyme (biochemical) reactions that ultimately control metabolism and at least 85% of these depend upon selective trace minerals for their activity. Therefore, inadequate mineral balance may result in suboptimal health.
10. Hair tissue mineral analysis is responsive not only to trace mineral levels in the diet but to all other factors which influence their metabolism including stress, exercise, endocrine and gastrointestinal function.

### **Who should have a hair analysis?**

Preventive oriented health practitioners recommend that everyone, especially children, should have their hair analyzed at least once per year as a measure for early detection of imbalances and/or toxicities. In this manner, individualized nutritional and lifestyle programs can be instituted to correct minor metabolic imbalances before they become advanced metabolic disease conditions. Special cases may warrant monitoring on a more frequent basis, (three to six months), i.e. those people on prolonged drug therapy, those with advanced metabolic diseases such as rheumatoid arthritis, diabetes, etc., and patients on detoxification and specific treatment programs.

### **Are health professionals utilizing hair analysis?**

Yes, hair analysis laboratories have extensive lists of nutritionally oriented doctors who utilize their services. However, it is not simply the performing of a hair analysis that is important but instead it is the interpretation and subsequent follow-up to correct metabolic imbalances that is of prime importance. This requires specialized training and thus this procedure is suited more to the holistic and nutritional type practices and those practitioners involved in preventive medicine.

As a patient you have the satisfaction of knowing that practitioners utilizing hair tissue mineral analysis are using one of the most valuable and advanced screening techniques, especially when used in conjunction with blood and urine analysis and dietary surveys. Research into the application and interpretation of hair analysis is continuing to improve and emphasize its use as a valid health care tool.

Should you have any questions regarding hair analysis, please do not hesitate to ask a practitioner skilled in using this technique.

### **How is hair analyzed?**

Approximately 2 tablespoons (about 1 gram) of your hair is taken from the recent growth of hair on the nape of the neck. Confirmation of environmental or other toxic metal exposure in some cases may require an analysis of pubic hair (which is not routinely used) to rule out contamination of scalp hair by commercial preparations, (e.g. certain shampoos, tints, permanents and other hair treatments). Your sample is analyzed by reputable laboratories using highly sophisticated and expensive laboratory equipment such as emission spectrophotometry, a method which can analyze for trace elements as low as a few parts per billion. Both the doctor and the patient are provided with a computerized copy of the results and the interpretation of the analysis. References are also included for further reading.

### ***What are the advantages of hair tissue analysis over blood, urine, or other tissue analysis?***

Research has shown that hair, more than blood or urine, closely reflects the minerals the body is accumulating, particularly in cases of toxic metal exposure (often the hair will indicate toxicity when the blood or urine do not). Hair is the second most metabolically active tissue in the body (second only to bone marrow) and trace elements in particular are accumulated in hair at concentrations that are generally 10-50 times higher than those

present in blood or urine. Napoleon's hair, analyzed in 1961 contained approximately 100 times the usual value for arsenic, implicating he may have been slowly poisoned. Certain blood mineral levels, e.g. serum calcium or serum iron can many times not reflect the true status of the nutrient because the blood is heavily buffered against significant changes in these concentrations.

Also, whereas blood and urine chemical analyses identify the level of chemical constituents at a specific instant in time, hair trace mineral analysis measures the deposition of elements averaged over a 3 month period. This affords trace element analysis of hair the unique perspective of assessing metabolic fitness and monitoring metabolic trends. Also, blood is an extracellular transporting medium for substances in the body and urine is indicative only of what the body is eliminating, not what is being stored. Hair, however, represents intracellular deposition of minerals and is in essence a living biopsy specimen.

Hair tissue mineral analysis is a relatively inexpensive, non-invasive and biologically stable sampling technique and avoids the expense and discomfort of other tissue biopsies, (e.g. liver, bone, skin). Hair analysis provides enough evidence to allow one to probe the molecular matrix of the patient in a very subtle biochemical manner.

#### **What scientific data is available to support hair analysis?**

There are over 1200 referential citations from respectable institutions and leading medical journals that have confirmed the value of hair tissue mineral analysis as a screening tool.