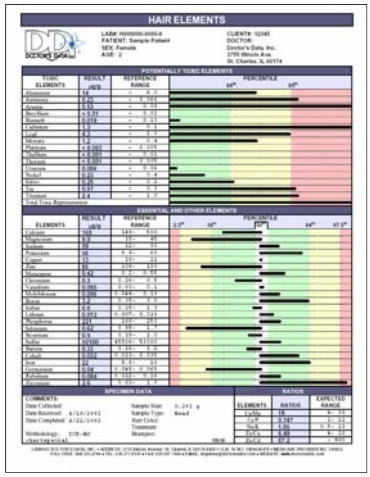
Helping Practitioners achieve improved patient outcomes

Hair Analysis



Why Hair Analysis?

Hair analysis is an accurate, low cost and non-invasive method of determining your body's level of essential mineral elements as well as toxic burden. With the enormous amounts of toxic metal in the environment and the widespread nutrient mineral insufficiencies of the modern western diet, assessing patients for element imbalances and excesses has become an increasingly important tool in the diagnosis of chronic illness. Hair Analysis provides your healthcare provider with important insight into treatment strategies for conditions ranging from depression and behavior disorders to cardiovascular and neurological illnesses. Practitioners have found Hair Analysis extremely useful in cases where no other cause was readily apparent for an illness or disease. Accordingly, Hair Analysis has become one of the most rapidly advancing fields in Functional Medicine testing, with ample research during the past three decades validating and suggesting that the relationship between hair element concentrations and human health is a complex process related to exposure, absorption, and tissue distribution of essential as well as toxic elements. Studies of the relationship of mineral status and behavioral disorders, cardiovascular disease, and cancer offer exciting possibilities–continuing to expand the range of applications for Hair Analysis.

When you don't feel ill exactly, but know that something is not right, and every test your doctor performs is 'normal', consider having a simple hair analysis performed. Just a few grams of your hair can be analysed to find out if element imbalances or toxicity may be the root cause of your health problems.

Is Hair analysis clinically useful?

Absolutely, as long as it is not over utilised or over interpreted. Hair analysis provides important information which, in conjunction with your symptoms, medical history and other laboratory results, can assist your health practitioner with an early diagnosis of physiological disorders associated with aberrations in essential and toxic element metabolism.

5 Reasons why hair is the specimen of choice for elemental analysis:

1. Hair testing is completely painless and noninvasive, making it also ideal for children .
2. Specimens are easily collected and last indefinitely.
3. Hair concentrations for elements are relatively high compared with blood or urine, thereby improving analysis.
4. The structure of hair is permanent, and once a nutrient or toxic element atom incorporates into the matrix, it remains there forever.
5. Element concentrations in hair accurately indicate past ingestion or exposure.

Won't a blood test yield the same results as a hair analysis?

Blood is a transportation medium. It is the "highway system" of your body. The components of your blood must remain very stable at all times, or you would die. Acidity, alkalinity, levels of certain nutrients, minerals, etc., all must remain within fairly tight limits. This equilibrium, or balance, is incredibly important to your health. Toxic elements are removed from your body's circulation and locked away in metabolically less inert tissues, such as fat, bone and nervous tissue.

Example: After a person ingests lead, a poisonous metal, the lead levels in the blood stay high for about 30 days. Then the lead disappears. Is it gone? Is the person out of danger? No. The answer is that the lead has now been removed from the blood. It is being stored in the tissues and would show up in a hair test - not a blood test.

Example: Your blood test shows adequate levels of calcium. Does this mean your calcium metabolism is good? Not necessarily. It could be that your body is robbing calcium from your bones and teeth to support a major organ. A Hair Analysis would show the actual mineral status of your tissues. A blood test could miss it.

Has Hair analysis been scientifically proven to be an accurate means of assessment?

Hair Analysis is firmly based upon established research in the fields of nutritional and environmental medicine. Clinical studies affirming the validity of hair testing stretch back for over 30 years in the medical literature. See references at the end of this document.

HAIR ANALYSIS *helps to determine your nutritional status as well as your level of toxic burden.*

Nutritional Status

Nutrient elements, including magnesium, chromium, zinc, copper and selenium, serve a variety of metabolic functions, are critical for hundreds of important enzymes and are also essential for the normal function of vitamins. As cellular regulators, they are involved in nerve transmission, maintenance of cell membrane permeability, and regulation of osmotic pressure, water balance, and acid-base equilibrium. Deficiencies among essential elements can lead to symptomatic problems. For example, low manganese can cause back and joint problems, allergies. Low magnesium can result in cardiovascular problems, muscular spasms and depression.

Various circumstances may result in inadequate status of nutritional elements: insufficient intake, poor digestion, poor absorption, and competitive inhibition by toxic elements. Hair elemental analysis is an invaluable and inexpensive screen for physiological excess, deficiency or mal-distribution of elements. Element imbalances are linked to a wide range of clinical conditions like: fatigue, headaches, malnutrition , depression, hypoglycemia, aggressive behaviour, learning disabilities, ADHD, autism, diabetes and many other chronic and degenerative diseases.

Biological functions of some minerals

Calcium: Bone and tooth formation, blood clotting, catalyst for biological reactions, maintenance and function of cell membrane, rickets and osteomalacia, osteoporosis prevention.

Selenium: Part of the enzyme glutathione peroxidase, preventing degenerative changes in the cell. Together with vitamin E, exerts a protective effect or cell integrity and retarding growth of cancer tissue. Provides a powerful protection against cadmium and mercury toxicity.

Zinc: Over twenty-five zinc containing enzymes involved in digestion and metabolism, integrity of skin, wound-healing, growth factor-like activity, essential to brain growth in intrauterine development, granulation and storage of insulin in the beta cells of the pancreas.

Potassium: Catalyst in many biological reactions, especially those involved in the release of energy in glycogen and protein synthesis. Maintenance of osmotic pressure acid-base balance; it plays a role in the transmission of nerve impulses, and in the release of insulin from the pancreas. Along with magnesium, acts as a muscular relaxant.

Magnesium: Important catalyst in many biological reactions, mostly in the mitochondria, influences protein synthesis, controls membrane permeability and influences the secretion of thyroxine. Prevents increased soft tissue deposit of calcium, important in cardiovascular and renal systems.

Copper: Facilitating iron absorption, part of respiratory enzyme system of an enzyme producing melanin, the dark pigment in hair and skin, in conjunction with ascorbic acid, copper maintains the activity of enzymes involved in the synthesis of elastinin the wall of the aorta and the connective tissue protein -collagen.

Toxic burden

A Hair test also measures toxic elements in your body. We are all exposed to toxic elements such as cigarette smoke (cadmium), antiperspirants & antacids (aluminum), tap water in some areas (lead), tooth fillings & fish (mercury) and pesticides (arsenic), etc. Toxic elements accumulate with excessive or continual exposure or if the body's detoxifying centers are overburdened and not coping well with toxins.
For example, excess mercury can lead to headache, tremor, poor mental concentration and excess aluminum has been linked with Alzheimer's disease. Therefore, hair is the tissue of choice for detection of body burden and past exposure to elements such as arsenic, aluminum, cadmium, lead and mercury.

Symptoms linked to toxic element exposure

CADMIUM
Loss of sense of smell, anemia dried scaly skin, hair loss, cancer, hypertension, kidney problems.

ARSENIC
Fatigue, headaches, dermatitis, increased salivation, muscular weakness, loss of hair and nails, pigmentation of skin, anemia, skin rashes.

LEAD
Children: delayed mental development, hyperactivity, delayed learning, behavioral problems.
Children and adults: fatigue, anemia, metallic taste, loss of appetite, weight loss and headaches, insomnia, nervousness, decreased nerve conduction, possibly motor neuron disorders.

MERCURY
Reduced sensory abilities (taste, touch, vision and hearing), metallic taste with increased salivation, fatigue, anorexia, irritability and excitability, psychoses, mania, anemia, paresthesias, tremors, inco-ordination, cardiovascular disease, hypertension with renal dysfunction.

Which laboratoty can I trust?

When is Hair Analysis unsuitable?

Any hair treated recently with external contaminants, e.g. hair products such as bleaches, perms and dyes may not provide accurate information. For suspect hair or treated hair, use Johnson's baby shampoo such as "No more tears" for a week or two before hair sample is taken. Also, if toxic exposure has only occurred very recently, the suspected element may not appear in the hair growth. In such a case, your practitioner may prefer to use a Urine Toxic element challenge test.

Why Doctor's Data for Hair Analysis?

Doctor's Data are the pioneers of Elemental Hair Analysis, being the world's first commercial laboratory to offer Hair Analysis in 1969. They have accumulated the world's largest database regarding hair element tests. (*Over 2 million since 1972*). Health practitioners in over 45 countries worldwide rely on Doctor's Data Inc tests to facilitate prevention and treatment of nutritional deficiencies and diseases of environmental origin.

Why Doctor's Data for Hair Analysis?
The main advantages of your Doctor's Data Hair Analysis are:

- **SIMPLICITY** AT A GLANCE REPORTS
  Three colour coding for rapid and easy interpretation of your test results.

- **EXPERT** COMMENTARY
  Clearly explains clinical implications of toxic and nutrient imbalances.

- **NO-CONFUSION** CLEAR DISPLAY
  Nutrient and toxic element markers conveniently arranged.

- **TOTAL ACCURACY**
  ICP Mass Spectroscopy, state of the art in laboratory testing which ensures you obtain the most accurate results.

What is ICP Mass Spectroscopy?

For the analysis of hair samples, Doctors Data uses Inductively Coupled Mass Spectroscopy (ICP-MS) which has been cited as currently the most sensitive and comprehensive technique available for multi-element analysis of trace elements. Results for nutrient and toxic element hair analysis using this method have shown the highest degree of concordance with certified values. This method allows extremely precise measurements of the quantities present of mineral nutrients, trace elements and toxic minerals. Doctor's Data state-of-the-art Elemental Hair Analysis assessments can detect element levels at the level of parts per billion or greater.
ICP-MS performs sample analysis of elemental composition based on the mass-to-charge ratio of the analyte under investigation. A pump transfers the aqueous hair sample to a nebuliser that converts the solution into an aerosol. The aerosol is carried by argon gas into the center of the ICP torch. The high temperature plasma (theoretically estimated at 8000 degrees Kelvin) vaporises and ionises the hair sample, then directs the ions into the mass spectrometer where elements are detected on the basis of a mass-to-charge ratio. The concentration of each element is calculated from a standard calibration curve. Slight element concentrations may go undetected using less sensitive analytical instruments. In fact, a recent study pointed to the clear limitations of other forms of laboratory testing commonly used by labs in routine hair analysis.

Hair Analysis - A powerful clinical tool supported by independent research

All Hair Analysis reports, interpretive guidelines, and application guides are firmly based upon established research in the fields of nutritional and environmental medicine. Clinical studies affirming the validity of hair testing stretch back for over 30 years in the medical literature. Today, many environmental and physiological studies examining low dose, long-term exposure to heavy metals routinely use trace element hair assessment as their analysis of choice. Hair analysis has also received validation through the legal system; in 1985, a U.S. District Court in Virginia ruled that "a multi-element spectral hair analysis...is a useful guide in the hands of a healthcare professional."

The following studies by the Environmental Protection Agency and other independent research groups clearly highlight the clinical advantages of using elemental hair analysis.

JAMA 1971;215(3):384-385. (Journal of the American Medical Association)
Trace element levels in hair accurately reflect community exposure to heavy metals such as arsenic, cadmium, and lead. Post-mortem studies also show a close correlation between levels of hair and bone lead. Hair is a convenient method of analysis, and exhibits powerful potential for gauging exposure to environmental pollutants.

Science 1978;202(22):1271-1273.
Studies from around the world show that hair concentrations of elements such as lead, arsenic, cadmium, and mercury "provide an accurate and relatively permanent record of exposure, there is a good correlation in hair and concentrations in internal organs." By using hair analysis of 14 different elements, one team of investigators could distinguish between children with and without learning disabilities with a 98% accuracy rate. Other relevant clinical applications of elemental hair analysis include mental disorders, cystic fibrosis, coeliac's disease, growth retardation, and diabetes.

Lancet 1982;2:259-261.
Blood levels of elements such as lead and mercury can only indicate immediate or very recent status of heavy metal exposure. For this reason, a documented case of industrial arsenic contamination in Italy shows that hair is a more reliable indicator of exposure than blood. The many advantages of using hair for analysis of element concentrations in the body include its relative consistency, structural integrity, sensitivity, convenience and long-range validity.

Trace Elements in Medicine 1987;4(3):131-133.
Based solely on hair analysis of magnesium, calcium, copper, strontium and barium, this researcher is able to positively identify patients with high cardiovascular risk with over 75% accuracy.

EPA (Environmental Protection Agency).
Toxic trace metals in mammalian hair and nails. Las Vegas: EPA, 1979.
This EPA report is based on a comprehensive review of the world literature on toxic trace elements in hair and nails of humans. The consensus of a wide range of experts in the field is that "if hair samples are collected properly, cleaned and prepared for analysis correctly, and analysed by the best analytical methods using standards and blanks, as required, in a clean and reliable laboratory by experienced personnel, the data is reliable."

EPA

Biological monitoring of toxic trace elements. Las Vegas: EPA, 1980.

For analysis of 11 crucial toxic elements, hair analysis is evaluated as "excellent" or "quite good." Because it can be used to evaluate levels of trace metals stored in the body, "hair is highly recommended for biological monitoring of man." Hair is lauded as an important medium by the United Nations Environmental Program for its effectiveness in monitoring exposure to heavy metals.

Biological Trace Element Research 1991;30:81-85.

Because hair zinc analysis "provides good evidence for long-term zinc status," it is used to examine zinc levels in mothers who have delivered infants with neural tube defects. Abnormally low hair zinc levels are found in these mothers compared to controls, suggesting a crucial role for zinc deficiency in the aetiology of neural tube defects.

Comprehensive Psychiatry 1991;32(3):229-237.

A review based on three separate studies discovers elevated levels of manganese in the hair of individuals with a history of violent behaviour compared to controls. The authors conclude that "abnormal trace element metabolism may be a factor associated with aggressive behaviour and that careful hair trace metal analyses may be a tool for detecting a proclivity to such behaviour."

British Journal of Psychiatry 1999; 287-290.

"Hair Analysis – New Laboratory Ability to Test For Substance Use". Hair analysis should be more widely used in clinical practice and in psychiatric research. Technological improvements in the design and in capabilities of gas chromatography linked to mass spectroscopy machines have made hair analysis extremely effective. The longer period that can be evaluated with hair offers advantages over urinalysis.

You can e-mail us on support@fxmed.co.nz for more information.