

ELEMENTS IN HAIR

The (trace) elements belong, like the vitamins, the essential amino acids and essential fatty acids to the elements human beings need to be able to function properly and that the human being is unable to produce from food. (Trace) elements are crucial parts of many kinds of biochemical conversions in the body, such as co-enzyme reactions. Deficiency or excess of (trace) elements can lead to a decreased function of several (organ) systems and the human body as a whole. Other elements and toxic metals can influence the need for a (trace) element. Consequently ratios are sometimes also important.

THE TEST

The trace(elements) in a hair test can provide insight into absolute and relative deficiencies, toxicities and imbalances between elements. The test can be used for diagnostic or preventive purpose. In the added table the clinical conditions warranting assessment are given per element.

Hair is collected easily without trauma on the part of the donor. Elements, in particular trace elements, are accumulated in hair at concentrations that are generally 10 to 50 times higher than those in blood are. Because of these higher levels, more elements can be measured in hair than in blood. The levels found in hair are mean values over a longer period of time (about 3 months).

Mind the following: (Trace) element/heavy metal levels in hair do not necessary reflect body levels. High levels also can be caused by exposure to the (trace) element/heavy metal via the environment/ (hair)treatment/hair products (like shampoo and hair dye)

The European Laboratory of Nutrients (ELN)/ Vitamin Diagnostics (VD) can test for the following elements/ heavy metals in hair (only panels, not single elements):

Aluminum (Al)	Copper (Cu)	Sodium (Na)	Vanadium (Va)
Cadmium (Cd)	Mercury (Hg)	Nickel (Ni)	Silver (Ag)
Calcium (Ca)	Lead (Pb)	Phosphor (P)	Zinc (Zn)
Chromium (Cr)	Magnesium	Selenium (Se)	Sulfur (S)
Iron (Fe)	Manganese (Mn)	Silicium (Si)	

For the test 1 gram of hair is needed. Only the hair from the nape of the neck that is closest to the scalp should be used. This is the hair that grew most recently. Hair that is at more than 3-cm distance from the scalp should be removed.

A special envelope with instructions will be sent to you on request

The ELN/VD can test for 2 panels of elements/heavy metals in hair:

- Panel I: Calcium, Chromium, Copper, Magnesium, Manganese, Selenium, Zinc, Cadmium, Mercury and Lead.
Panel II: Panel I + Phosphor, Sodium, Silicium, Vanadium, Iron, Sulfur, Aluminum, Nickel and Silver.

TEST INDICATIONS

- A total elements check-up is advised in case of:
- Poor (general) health
- Suppressed immunity/ allergy
- Exposure to toxic metals
- Cardiovascular diseases
- Glucose-intolerance/hypoglycemia
- Cancer
- Vague complaints and aspecific symptoms like fatigue and headache
- Psychological, behavioral and learning difficulties/ mental diseases
- Complaints of joints and bones
- Monitoring the effect of suppletion
- Preventive purpose/ to detect subclinical deficits
- Check possibilities of optimizing health/performance

Table: single elements and clinical condition warranting assessment.

(trace) element	Clinical conditions with possible relation to high/low level. ^{1,2}
Aluminum (Al)	Toxicity: Loss of appetite, nausea, colic, pain in muscles, weak bones, weakness, dementia, mental complaints.
Cadmium (Cd)	Toxicity: Atherosclerosis, hypertension, decreased immunity
Calcium (Ca)	Low: Brittle bones/osteoporosis, joint pains, muscle cramps, mental complaints like irritability, tooth decay, slow blood clotting/ hemorrhage, pregnancy.
Chromium (Cr)	Low: Alcoholism, atherosclerosis, glucose intolerance/hypoglycemia, pregnancy. Toxicity: skin problems.
Magnesium (Mg)	Low: Alcoholism, allergy, caries, diabetes, diarrhea, dysmenorrhea, eclampsia, epilepsy, cardio-vascular diseases, high/low blood pressure, high intake of calcium, phosphates and vitamin D, headache, hyperactivity, hypothermia, complaints of the muscles and muscle cramps, mental diseases like anxiety, depression, disorientation, hallucination, irritability and confusion, nausea and vomiting, tiredness, kidney stones, osteoporosis, spasm, stress (also because of noise, infection or disease), decreased breathing, pregnancy.
Mercury (Hg)	Toxicity: Diarrhea, neurological complaints like irritability, moodiness and depression, loss of coordination, intellectual ability, vision and hearing.
Manganese (Mn)	Low: Convulsion, diabetes, weak bones, loss of hearing, glucose intolerance, neurological complaints, and sterility. Toxicity: anorexia, psychological and motor difficulties.
Nickel (Ni)	Toxicity: Headache, nausea and vomiting, respiratory problems
Potassium (K)	Low: Slow irregular heartbeat, neuromuscular diseases like signs of paralysis, and weakness.
Copper (Cu)	Low: Anemia, atherosclerosis, osteoporosis, poor wound healing, too high zinc or cadmium, vitiligo. Toxicity/high: mental illness, (postpartum) depression, liver cirrhosis, and organ damage.
Lithium (Li)	Low: Aggressive behavior, depression.
Lead (Pb)	Toxicity: Stomach ache, hypertension, mental diseases like depression, dizziness, concentration impairment, irritability, restlessness, confusion and impaired memory, pain in the muscles, premenstrual syndrome, decreased immunity against infection, fatigue, pregnancy-related diseases.
Selenium (Se)	Low: Asthma, eczema, joint complaints, heart diseases, (increased sensitivity for) infections, high exposure to heavy metals (e.g. mercury), cancer, decreased fertility of man, decreased glutathion peroxydase activity, hypothyroidie (decreased conversion of T4 to T3), increased degeneration. Toxicity: loss of hair, teeth and nails, brittle nails, skin problems, Gastro-intestinal distress, garlic breath odor, lethargy
Silicium (Si)	Low: Poor condition of connective tissue.
Vanadium (Va)	Low: High cholesterol/ cardiovascular diseases, glucose-intolerance/ hypoglycemia, impaired growth.
Iron (Fe)	Low: Anemia, fatigue, and pregnancy. Toxicity/high: hemochromatosis, headache, shortness of breath, accelerated degeneration, diabetes, impaired organ functions (liver, pancreas, heart)
Zinc (Zn)	Low: Impaired growth, alcoholism, impotence (young man), irregular menstruation (young women), infertility, poor wound healing, loss of taste/sense of smell, pregnancy. High: Copper deficiency

LITERATURE

- Gayla J. Kirschmann. Nutrition Almanac. Fourth edition McGraw-Hill, New York, USA 1996
- Melvyn R. Werbach. Nutritional influences on Illness. A sourcebook or clinical research. Third Line Press. USA, 1993.

Update: 09-2007