



EUROPEES LABORATORIUM
VOOR NUTRIENTEN
EUROPEAN LABORATORY
OF NUTRIENTS

Regulieringsnr 9, 3984 LA Bunnik
Postbus 10, 3980 CA Bunnik
The Netherlands

KvK: 30073660
Tel: 31-(0)30-2871492
Fax: 31-(0)30-2802688

HEALTH DIAGNOSTICS AND
RESEARCH INSTITUTE

Vitamin Diagnostics, Inc.
540 Bordentown Ave.
Suite 2300
South Amboy, NJ 08879
Tel: 732-721-1234
Fax: 732-525-3288

ELEMENTS IN BLOOD

The (trace) elements belong, like 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 elements in a blood test can provide insight into absolute and relative deficiencies, toxicities and imbalances between elements. The test can be used for diagnostic or preventive purpose. The test can also give insight into the effect of dietary changes/supplementation. The test gives information about the levels at the moment of blood taking.

The European laboratory of nutrients (ELN)/ Health Diagnostics and Research Institute (H.D.R.I.) can test for the following elements in blood:

Aluminium (Al)	Lead (Pb)	Nickel (Ni)
Arsenic (As)	Lithium (Li)	Potassium (K)
Calcium (Ca)	Magnesium (Mg)	Selenium (Se)
Cadmium (Cd)	Manganese (Mn)	Vanadium (V)
Chromium (Cr)	Molybdenum (Mo)	Zinc (Zn)
Cobalt (Co)	Mercury (Hg)	
Copper (Cu)	Sodium (Na)	

All elements, with the exception of vanadium, can be measured in whole blood. Lithium also can be measured in serum. Calcium, potassium, chromium, copper, magnesium, selenium, sodium and zinc also can be measured in serum and bloodcells. Vanadium only can be measured in bloodcells. By measuring the quantities in and outside the bloodcells, additional information is obtained about the location of a deficiency.

The ELN/H.D.R.I. can test for single elements or for one of the panels below:

- Panel I: Selenium in whole blood; calcium in whole blood and serum; copper, magnesium, potassium, sodium and zinc in whole blood, serum and bloodcells; hematocrite; zinc/copper ratio in cells
- Panel II: Panel I + : chromium, manganese, molybdenum, vanadium, lead, nickel and cobalt in whole blood; calcium in bloodcells; selenium in serum and bloodcells. potassium and calcium in serum and bloodcells.
- Panel III: Panel II + aluminium, arsenic, cadmium and mercury in whole blood; lithium in serum.

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, behavioural 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}
Aluminium (Al)	Toxicity: Loss of appetite, nausea, colic, pain in muscles, weak bones, weakness, dementia, mental complaints.
Arsenic (As)	Toxicity: headache, confusion, convulsion, vomiting, severe diarrhea
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,
Cobalt (Co)	Low: pernicious anemia, retarded growth
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.
Manganese (Mn)	Low: Convulsion, diabetes, weak bones, loss of hearing, glucose intolerance, neurological complaints, sterility. Toxicity: anorexia, psychological and motor difficulties.
Mercury (Hg)	Toxicity: Diarrhea, neurological complaints like irritability, moodiness and depression, loss of coordination, intellectual ability, vision and hearing.
Nickel (Ni)	Toxicity: Headache, nausea and vomiting, respiratory problems
Potassium (K)	Low: Slow irregular heartbeat, neuromuscular diseases like signs of paralysis, weakness.
Copper (Cu)	Low: Anemia, atherosclerosis, osteoporosis, poor wound healing, too high zinc or cadmium, vitiligo. Toxicity/high: mental illness, (postpartum) depression, liver cirrhosis, 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
Vanadium (V)	Low: High cholesterol/ cardiovascular diseases, glucose-intolerance/ hypoglycemia, impaired growth.
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

1. Gayla J. Kirschmann. Nutrition Almanac. Fourth edition McGraw-Hill, New York, USA 1996
2. Melvyn R. Werbach. Nutritional influences on Illness. A sourcebook of clinical research. Third Line Press. USA, 1993.
3. Melvyn R. Werbach. Nutritional influences on mental illness. A sourcebook of clinical research. Third Line Press. USA, 1991.

Update: 08-2011