

## VITAMINS IN BLOOD

Vitamins belong, like elements, amino acids and fatty acids to the essential elements human beings need to be able to function properly and that a human being is unable to produce from food. Vitamins are crucial parts or many kinds of biochemical conversions in the body, such as co-factors in enzyme reactions. Deficiency or excess of vitamins can lead to a decreased function of several (organ) systems and the human body as a whole.

Testing for vitamins in blood can provide insight into absolute and relative deficiencies. The test can be used for diagnostic or preventive purpose. The test also can give insight into the effect of dietary changes/supplementation.

### THE TEST

Most vitamins - the B vitamins (B1, B2, B3, B5, B6, B12, folic acid and biotin) - are measured with a micro-animal vitamin assay. The micro-animal assay uses micro-animals with about the same need for vitamins as man. Vitamin levels tested by this method reflect only the metabolically available vitamin. The method offers the earliest indication of vitamin deficits. The method is more sensitive and specific than chemical techniques

The European Laboratory of Nutrients (ELN)/ Vitamin Diagnostics (VD) can test for the following vitamins in blood:

Vitamin A	Vitamin B6	Vitamin E	Lipoic acid
Carotene (total)	Vitamin B7 (Biotin)	Vitamin K	
Vitamin B1	Folic acid (B9)	Carnitine (total)	
Vitamin B2	Vitamin B12	Carnitine (free)	
Vitamin B3	Vitamin C	Acetyl Carnitine	
Vitamin B5	Vitamin D3	Co Q10	

The ELN/VD can test for single vitamins or for one of the panels below:

4-Vitamin panel:	A, B1, B6, E
8-Vitamin panel:	A, Carotene, B3, B6, B9 (folic acid), B12, C, E
12-Vitamin panel:	A, Carotene, B1, B2, B3, B5, B6, B7 (biotin), B9, B12, C, E
16-Vitamin panel:	12 panel + Carnitine (total), D3, K, Co-Q10
19-Vitamin panel:	16 panel + free carnitine, acetylcarnitine, lipoic acid

### TEST INDICATIONS

A complete vitamin profile is recommended in case of:

- Gastro-intestinal disorders.
- Persons maintaining a regimen for weight loss.
- Blood disorders.
- Alcoholism.
- Cardiovascular diseases.
- Cancer.
- Liver diseases.
- Tiredness
- Neurologic diseases.
- The elderly.
- Persons taking drugs
- Signs of malnutrition.
- Pregnancy.

Table: vitamins and clinical conditions warranting assessment.

<b>Vitamin</b>	<b>Clinical conditions warranting vitamin assessment.<sup>1,2</sup></b>
Vitamin A/ Carotene	Alcoholism, high vitamin A-intake, eye diseases/night blindness/dry eyes, depressed immunity, fat malabsorption, strange eating habits, skin diseases /mucous membranes, diseases/surgery to the intestine, kidney- or liver diseases.
Vitamin B1 (thiamin)	Alcoholism, drug abuse and mental diseases like peripheral neuropathy, liver diseases, impaired heart function, strange eating habits.
Vitamin B2 (riboflavin)/ vitamin B5 (pantothenic acid)	Alcoholism, dry lips, skin-lesions at corners of mouth, complaints of the eyes (vit.B2; like burning eyes, blurred vision), liver diseases, neurologic diseases like the 'burning feet syndrome', cataracts (B2), tongue changes.
Vitamin B3 (niacin)	Dementia, dermatitis, diarrhea, skin rash, swollen tongue.
Vitamin B6	Alcoholism, anemia, liver diseases, Neurological complaints, pre-menstrual tension, food fadism, pregnancy.
Folic acid and vitamin B12	Alcoholism, anemia, drug abuse, liver diseases, neurological complaints, food fadism, diseases/operations to the stomach or intestine, pregnancy.
Biotin	Alcoholism, skin lesions, convulsive seizures, food faddish.
Carnitine (vitamin BT)	Heart diseases.
Vitamin C	Bleeding gums, cardio-vascular diseases, poor wound healing, susceptible to infections, food fadism, bleeding into tissue/
Vitamin D	Cramps, weak bones.
Vitamin E	Cystic fibrosis, intestinal diseases, fragile red bloodcells, cardiovascular diseases, liver diseases, neurological diseases, fat malabsorption.
Vitamin K	Hemorrhaging, Intestinal diseases like coeliakie, Crohns disease, cystic fibrosis, and ulcerative colitis, (fat) malabsorption, long parental feeding, obstruction of bile duct, osteoporosis, newborn infants.

#### **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.

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