



The Great Plains Laboratory, Inc.

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Requisition #:	9800800	Physician Name:	WILLIAM SHAW
Patient Name:	Sample Sample	Date of Collection:	Aug 30, 2019
Date of Birth:	Jan 1, 2000	Time of Collection:	07:00 AM
Gender:	M	Print Date:	Sep 10, 2019

Homocysteine

Patient Value	Reference Range	High/Low Flag
$\mu\text{mol/L}$	$\mu\text{mol/L}$	
9.50	0.00 - 6.00	H

Reference Ranges

Values at or below 6.0 micromoles/L are considered to be associated with optimum health in all ages and sexes. Therefore, all values above 6.0 are flagged as high (H). The higher the value, the greater the risk of the diseases listed below. Values as high as 300 micromoles/L have been found in children with genetic diseases and severe atherosclerosis.

Homocysteine interpretation

Diseases associated with elevated homocysteine

High homocysteine is associated with increased risk of ischemic heart disease, stroke, peripheral arterial disease and deep venous thrombosis, as well as for neural tube defects and preeclampsia in pregnancy. High concentrations of homocysteine in blood induce endothelial dysfunction, suggesting a causal role in vascular disease. An increased frequency of high homocysteine is observed in the elderly, smokers, patients with renal disease, diabetes or on a strict vegetarian diet deficient in vitamin B12. High homocysteine values have been associated with autism, Alzheimer's disease, depression, schizophrenia, cancer, hip fracture, cognitive impairment, and Parkinson's disease.

Factors that elevate homocysteine

Factors that increase homocysteine include severe or mild genetic deficiencies (SNPs) of enzymes in the transulfuration methylation cycle such as MTHFR, CBS, BHMT and others, a diet high in methionine, or deficiencies of folate, vitamin B12, vitamin B6, or trimethylglycine (betaine). Other factors that elevate homocysteine include megadoses of niacin, nitrous oxide anesthesia, and excessive copper. Severe mutations such as deletions in the above enzymes can lead to extremely high values of homocysteine. SNPs in the transulfuration methylation cycle can be determined by The Great Plains Laboratory DNA methylation pathway profile.

Factors that decrease homocysteine

Homocysteine is decreased by a diet high in folate compounds, vitamin B12, methylcobalamin, trimethylglycine (betaine), or supplements containing these vitamins. Homocysteine may be elevated in Down's syndrome due to the fact that the cystathionine beta synthase (CBS) gene is present in higher doses due to the trisomy of chromosome 21 which contains the CBS gene. In addition, exposure to many toxic chemicals can upregulate CBS leading to increased conversion of homocysteine to cystathionine with concomitant decrease of homocysteine. Conversely, removal of toxic chemicals may result in increased serum homocysteine as CBS transcription normalizes.