

Homocysteine

❖ What is homocysteine?

Homocysteine is an amino acid that your body makes from another amino acid called methionine. You obtain methionine from many of the protein-dense foods that you eat on a regular basis, such as meat, eggs, and fish.

❖ Clinical significance:

Elevated level of homocysteine in blood is an independent risk factor for atherosclerotic vascular disease affecting the coronary (arteries supplying the heart), cerebral (arteries supplying the brain) and peripheral arteries (supplying the rest of the body).

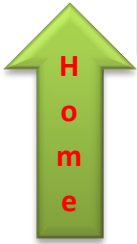
❖ Factors which can result in increased SERUM Homocysteine:

- **Genetics:** altered enzyme activity of HCy related pathways
- **Sex:** men higher than women
- **Diet:** low intake of B6, B12, Folate, and/or methionine
- **Renal (kidney) disease:** increases with serum creatinine
- **Transplantation**
- **Post stroke**
- **Severe psoriasis**
- **Corticosteroid therapy**
- **Cyclosporine**
- **Smoking**

❖ Homocysteine & Cardiovascular Risk

- Injures the inner lining of blood vessel walls.
- Oxidizes LDL cholesterol, making it more likely to stick to injured blood vessels.
- Accelerates the growth of smooth muscle cells, narrowing blood vessels.
- Induces oxidative stress and impairs the ability of blood vessels to expand and contract.
- Increases blood clot formation, which can lead to a heart attack or stroke

❖ How is the homocysteine level measured?



Homocysteine is measured using a simple blood test. It can be measured at any time of day. You don't have to prepare in any special way for the blood test.

❖ **What do the results mean?**

A healthy homocysteine level is less than 12 $\mu\text{mol per L}$. A level greater than 12 $\mu\text{mol per L}$ is considered high. If your homocysteine level is greater than 12 $\mu\text{mol per L}$ and you have blockages in any blood vessel, you need to lower your homocysteine. If you have no other major risk factors for cardiovascular disease and you do not have atherosclerosis, it may be okay for you to have a modestly high homocysteine level (12 to 15 $\mu\text{mol per L}$).

❖ **Who should have their Homocysteine level tested?**

Homocysteine testing may be most useful in checking the overall risk of heart disease for people who have a strong personal or family history of heart disease but who do not have other risk factors that can be controlled, such as smoking or high blood pressure. Homocysteine testing also may be useful for people who have early heart disease but who do not have known risk factors and for people who have had unexplained deep vein thrombosis or stroke.

❖ **How can I lower a high homocysteine level?**

Dietary supplementation with folic acid can reduce elevated homocysteine levels in most patients. The usual therapeutic dose is 1 mg/day. When this is not effective, vitamins B6 and/or B12 can be added to the regimen, which should be continued permanently.