

# HOMOCYSTEINE

## The Important H Factor

Research has shown that elevated homocysteine levels play a significant role in the risk of heart attack, cancer, diabetes, Alzheimer's and rheumatoid arthritis. The extraordinary findings of a comprehensive research study at the University of Bergen in Norway, published in 2001 in the American Journal of Clinical Nutrition, showed that just a 5-unit increase in Homocysteine increased the risk of death from cardiovascular disease by 50%, increased the risk of death from cancer by 26%, and increased the risk of death from causes other than cancer or heart disease by 104%.

### What Is Homocysteine?

Homocysteine is an amino acid that is naturally produced in all of the body's cells, and is usually present in very low quantities. However, if a person is not optimally nourished, homocysteine can accumulate in the blood. The average homocysteine level is 10 units, with the ideal level below 6 units. Those with cardiovascular disease often have a level above 15 units. According to studies reviewed from the Department of Cardiology at Southampton General Hospital (England) and published in the British Medical Journal, lowering one's homocysteine level from 16 units to 6 units might cut the risk of heart attack by 75%! These researchers concluded that these highly significant results indicate strong evidence that the association between homocysteine and cardiovascular disease is CAUSAL. This means that having a high homocysteine level isn't just associated with higher risk, it actually causes heart disease. If therefore, you can lower your homocysteine level (according to researchers), you remove the cause, and lower the risk. In addition to this, Dr. Kilmer McCully, a cum laude Harvard-trained MD has viewed cholesterol problems as a symptom of heart disease rather than its cause. Through a series of case reviews, he landed on the problem of high homocysteine as the cause.

Homocysteine is produced from the amino acid methionine, which is found in dietary protein. The body converts homocysteine into one of two beneficial substances: Glutathione and SAME. However, in order for this methylation process (a process of adding molecules called methyl groups to turn one thing into another) to occur, certain nutrients must be present to provide the enzymes necessary for this conversion. They are: B2, B6, B12, Folate, Zinc, and TMG (trimethyl glycine). If one were lacking in these nutrients, the conversion of homocysteine could be blocked, causing its level to rise, and thus, creating a greater risk for degenerative diseases.

The process of conversion is as follows:

### Conversion to SAME:

The body receives Methionine from food – it is converted to Homocysteine. From homocysteine the body will use Methyltransferase (needs folate, B12, B2, and zinc for this) to convert to methylenetetrahydrofolate reductase (MTHFR). MTHFR converts to SAME (needs TMG and B12 for this). SAME is an important physiological compound for the brain and body.

### Conversion to Glutathione:

The body receives Methionine from food – it is converted to homocysteine. From homocysteine the body will use Cystathionine Lyase (needs B6, B2, and zinc for this) to convert to Cystathionine Beta-synthase. Cystathionine Beta-synthase converts to Glutathione (needs B6, B2 and zinc for this). Glutathione is the body's most important antioxidant. By this conversion process as noted above, we can see the importance of having adequate amounts of the nutrients: B2, B6, B12, Folate, Zinc, and TMG in order to allow conversions and keep homocysteine levels where they should be. Factors that may cause one to have higher than normal homocysteine levels (and most of these can be reversed or reduced) are:

- Genetic inheritance
- Folate intake of less than 900 mcg/day
- Increasing age
- Estrogen deficiency
- Excessive alcohol, coffee or tea intake
- Smoking
- Lack of exercise
- Hostility and repressed anger
- Inflammatory bowel diseases
- H.pylori-generated ulcers
- Pregnancy
- Strict vegetarianism
- High fat diet with excessive red meat
- High salt intake

You can get your homocysteine level checked by your Medical Doctor. Or, your Doctor may be able to provide you with a kit to test it on your own at home. ♦