

Elevated Cholesterol and Homocysteine

The evidence linking inflammation of the blood vessels and heart disease/hardening of the arteries is well documented. There is considerable debate about the role of cholesterol in this process. Cholesterol appears to be trying to repair the artery wall after the inflammation has occurred rather than causing the initial damage. Elevated cholesterol levels can be caused by low thyroid function, high insulin levels and eating excess animal protein or unhealthy fats. High sugar levels (prediabetes or diabetes and not enough exercise) and chronic stress cause high insulin levels. Insulin is a big message for the liver to store sugar as fat and therefore make more cholesterol. High insulin levels are also a risk for blood vessel damage. This helps us see how high mental stress in a sedentary person is a double message to create inflammation. These same two triggers (sugar and stress) increase cortisol from the adrenal glands which tell the body injury has occurred and the body makes "acute phase reactants" or inflammatory markers. This whole system was designed to help us recover from physical trauma. Unfortunately it is activated by mental stress as well with harmful consequences. This also explains the long known connection between Type A personalities and heart disease.

Elevated cholesterol levels must be interpreted with the added information from several other tests. Glucose or sugar levels,

inflammatory markers, and a newer test called homocysteine help look at the bigger picture. Low thyroid function can contribute significantly to elevated cholesterol and thyroid tests should be checked. The breakdown of cholesterol into the HDL or good cholesterol and LDL or bad cholesterol is helpful also.

Triglycerides are saturated fats and usually elevated with high sugar levels or the wrong fats in the diet. Together these tests give information about diet, lifestyle and genetics. Genetics are only about 10% of the picture with nutrition (including supplements) and lifestyle being the more important factors.

Inflammatory Marker Tests:

C Reactive Protein is a general marker of inflammation in the body and could be elevated from arthritis, any type of infection (dental or sinus infections can be hidden), or high stress leading to adrenal glands releasing excess cortisol.

Fibrinogen is another inflammatory marker which increases with the blood's tendency to clot.

Homocysteine is an amino acid (building block of protein) which we consume in our food that needs to be metabolized out of the body. Vitamin B12 and folic acid are needed to metabolize and get rid of it. Elevated levels of homocysteine are clearly linked to

higher risk of heart and blood vessel disease. Although some labs give the normal range up to 12, I would recommend a level below 9 for optimal health of your vessels. Elevated homocysteine is treated by increasing your Vitamin B12 and folic acid. Folic acid is in leafy green vegetables and brewers yeast. B12 is only found in animal protein and vegetarians may need to supplement. Some people have a very hard time absorbing Vitamin B12 and it can be given as an injection monthly if your homocysteine does not respond to supplements. Vitamin B12 and folic acid levels can also be checked.

Dietary Recommendations:

This is a very confusing subject with many contradictory points of view. I highly recommend the chapter on fats in Nourishing Traditions cookbook (by Sally Fallon). Multiple studies show that simply decreasing the cholesterol in the diet does not decrease cholesterol in the blood. We now know that excess cholesterol is the body's way of telling us we have a problem with inflammation. As a matter of fact the polyunsaturated fats so highly recommended actually go bad or rancid easily when heated or used in cooking. It is rancid or "aged" fat which creates free radicals. Free radicals are the unstable atoms that do the real damage causing the inflammation in all our tissues – not just blood vessels. If we address the causes of inflammation and free radicals our cholesterol will decrease. The following is a summary of

dietary recommendations to help this happen:

1. Avoid sugar and white flour (which is 6 sugar molecules linked together).
2. Avoid hydrogenated fats (margarine, shortening). These are basically plastic. Labels are calling these trans fats. All fast fried food contains these.
3. Address any vitamin and mineral deficiencies with diet or supplements.
These are critical co-factors for repair of all free radical damage. We can check vitamin D levels and tissue levels of magnesium to screen you.
4. Avoid powdered milk and eggs. These contain damaged cholesterol.
5. Do use monounsaturated fats – they are stable with heat. These are olive oil, canola oil, peanut oil and oil in avocados.
6. Do use polyunsaturated oils but do not heat them. Use ones which have more Omega 3 fatty acids than Omega 6 fatty acids. These are flax seed oil, sesame, and almond oil. Other sources of omega 3 fatty acids include eggs from free range organically fed hens, ground flax seeds, wild salmon, fresh nuts and nut butters. Keep these oils refrigerated.
7. Do eat small amounts of select saturated fats such as

organic butter and coconut oil. These fatty acids have important anti-microbial and immune boosting properties and some people lack the enzymes to make them from other dietary sources.

8. Only buy oils that are expeller-expressed, unrefined and organic. Any other oil extraction method heats the oil and uses a solvent to extract the oil. This leaves toxic residues in the oil and damages it. Smelling an oil or nut butter will tell you if it is rancid and should be discarded. Keep oils stored in opaque containers.
9. Experiment with reducing your portion size of animal protein (meat, chicken, fish, eggs and dairy) and using more vegetarian recipes. All animal protein contains cholesterol. I have had people decrease their cholesterol by 100 points when they stopped eating cheese!
10. The overall recommended amount of fat in your diet will vary based on your medical problems and current test results. Most Americans need to reduce fat to 20 – 30 % of their calories. It is most important to emphasize the quality of the fat and derive as much from whole, natural food sources mentioned above especially seeds and nuts. Not eating enough of the right fats can be counterproductive.
11. Increase the fiber in your diet with vegetables, whole grains, legumes and fruits. These have the water soluble fibers of psyllium, guar gum, pectin and oat bran which

decrease LDL cholesterol and raise HDL levels. Wheat bran is an insoluble fiber and does not lower cholesterol.

12. Use onions, garlic, and ginger regularly in cooking. They decrease the stickiness of our clotting cells (platelets) and lower cholesterol.

Lifestyle and Supplements for Elevated Cholesterol

Lifestyle:

Changes in this area should be made gradually to raise your success rate. Pick one area to concentrate on and then move to others. Smoking cessation is critical – it alone raises your risk of blood vessel damage by 5 times average. Exercise is most beneficial if done daily – even 20 minutes of walking reduces risk of all causes of mortality. It raises your HDL or good cholesterol and reduces the total. Alcohol clearly elevates triglycerides and cholesterol as well as blood pressure. An association between heavy coffee consumption (6 cups per day) and cholesterol elevation also exists. Reducing Type A behavior and decreasing stress hormones with meditation, Tai chi or Yoga can have a significant benefit and help normalize sleep.

Supplements:

- Broad spectrum multivitamin including trace minerals
- Vitamin E – 400 IU per day

- Vitamin C – ester C form, 1000 mg per day
- Essential fatty acids – EPA, GLA, DHA – these are found in borage oil, evening primrose oil, black current seed oil and in combination with some fish oils.
- Omega 3 fatty acids – Carlson Labs or Nordic Naturals Cod liver oil in liquid or gel cap is guaranteed mercury free. Dose is 390 mg – 1000 mg per day. Ground flax seeds are another excellent source: 1 Tbsp per day. OK to grind a weeks worth at a time and keep refrigerated.
- Other antioxidants: Alpha lipoic acid 400 mg per day and/or CoQ10 30 mg per day.

Statin drugs:

Appear to work by decreasing injury to blood vessels.

They decrease your levels of Co Q10 – a natural antioxidant.

They decrease testosterone levels and that decreases the repair rate of blood vessels and muscles throughout the body.

By lowering cholesterol without lifestyle or diet change they give the picture of protection without the substance of real health.

Please share and keep your fats fresh!

Gail Eberharter MD ©