P I O N E E R
NUTRITIONAL FORMULAS, INC.

# Pioneer Pearls

THE PIONEER HEALTH EDUCATION LIBRARY NEWSLETTER Volume 3 Issue 1

# HEALTHY HEART ISSUE

## *Ask the Nutritionist*

*Teresa Kerr, RD, MA, is co-owner of Pioneer Nutritional Formulas, Inc. She has been a medical dietician in private practice for over 30 years.*

## Homocysteine Explained

*Q: My doctor says that I may be at risk for cardiovascular disease because of high homocysteine levels. What is homocysteine, and how does it affect heart health?*

Teri Kerr: In recent years, science has established that moderately elevated plasma or serum homocysteine concentrations constitute an increased risk for cardiovascular disease in members of the general population.[1] And in persons with confirmed coronary artery disease, high total homocysteine levels (greater than 15 µmol/l) are associated with a greater incidence of fatal heart attack.[2]

The mechanism by which elevated homocysteine contributes to vessel disease is not yet clearly understood. Homocysteine is believed to somehow irritate the endothelial lining of blood vessel walls, leading to atherosclerosis. High homocysteine levels may also promote the oxidation of LDL cholesterol, a substance noted for its ability to push under vessel walls and cause plaque. Atherosclerosis due to plaque is the underlying cause of many cardiovascular problems. Homocysteine also seems to activate blood coagulation,[3] creating the "sticky blood" that increases the opportunity for clots to form. Inappropriate blood clots are implicated in thrombo-phlebitis and ischemic stroke.

### Where homocysteine comes from

We do not eat homocysteine directly - we make it ourselves from methionine, an essential, sulfur-containing amino acid found in protein foods. As an intermediary by-product of methionine metabolism, homocysteine is not a typical amino acid, although it resembles one and is commonly referred to as such.

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### *In This Issue*



## *Ask Doctor Jim*

*Jim Lemkin, N.D., C.N.S., is founder and co-owner of Pioneer Nutritional Formulas, Inc. He is a naturopathic and homeopathic physician in private practice since 1980.*

## Take Herbs to Heart

*Q: Are there any herbs I can take to help strengthen my heart and protect against heart disease?*

Dr. Jim: Yes. Herbs to treat the heart have been used for millennia by nearly every culture in the world – from Native American to European, from African to Indian and Chinese. Extracts of foxglove (digitalis), strophanthus (ouabain) and rauwolfia have been the basis of conventional Western medicine for generations. But to answer your question we must first ask: what is it about the heart that you want to strengthen and protect?

### The pump and the pipes: heart muscle and blood vessels

*Cardio-* refers to the heart muscle and nerve/electrical system in the muscle and *-vascular* refers to the virtually thousands of miles of arteries, veins and capillaries that run into and out of the heart, plus vessels that feed the blood's nutrients to the heart muscle itself and vessels that bring these nutrients to every part of the body. Without all parts working efficiently together we can not achieve true cardiovascular health.

### Prevent disease and/or treat existing conditions?

It is usually a whole lot easier to prevent a disease than to try to reverse it after it has taken hold. Many sound recommendations for maintaining good cardiovascular health are available in a free brochure, *Heart Health* which will be available at the Pioneer website (*www.pioneernutritional.com)* or by request. If you are presently healthy or have an inherited predisposition to heart disease, it is especially impor-

*Ask Dr. Jim continued on Page 4*

# Tidbits from Teri...

**Vascular dementia lessened with vitamins E and C** Vascular, or multi-infarct dementia results from decreased blood flow to and subsequent death of brain tissue. Hypertension and stroke are common causes. Research following more than 3000 elderly men over a period of 25 years showed that subjects who supplemented with vitamins C and E enjoyed a significant protective effect against vascular dementia. Cognitive test perfomance was also significantly better in the vitamin-taking men. [Association of Vitamin E and C Supplement Use With Cognitive Function and Dementia in Elderly Men *Neurology* 2000 54:1265-1272]

**As we age, so do our cells** New findings indicate the critical time for age-related changes in human skeletal muscle mitochondria occurs between 40 and 50 years old. Experts in functional medicine suggest supplementing with redox-active substances such as CoQ10, vitamin E, lipoic acid and flavonoids to decrease mitochondrial damage in aging. [Age-related Mitochondrial DNA Damage *Functional Medicine Update* 2001 Sep; 26:00, 177-78]

**CoQ10 effective in reducing hypertension** Over 50 million adults suffer from hypertension, a strong risk factor for cardiovascular-related death. To control the condition, doctors commonly prescribe anti-hypertensive medication, which may produce undesirable side effects. However, recent clinical trials indicate that CoQ10 supplementation can both effectively reduce high blood pressure *and* significantly reduce the need for prescription medications to treat it. In one study of 109 hypertensive patients, 51% were able to discontinue use of between one and three anti-hypertensive drugs within 5 months of starting CoQ10 therapy. [Langsjoen P, Willis R, Folkers K. Treatment of essential hypertension with coenzyme Q10 *Mol Aspects Med* 1994;15 Suppl:S265-72] In another randomized, double-blind, placebo-controlled trial of 83 hypertensive men and women, 60 mg of CoQ10 taken twice a day was found to reduce systolic blood prssure by 17.8 (+/- 7.3) mm Hg. [Burke BE, Neuenschwander R, Olson RD. Randomized, double-blind, placebo-controlled trial of coenzyme Q10 in isolated systolic hypertension *South Med J* 2001Nov; 94(11):1112-17] *N.B. If you take heart medications, be sure to consult your physician when commencing CoQ10 therapy.*

**Echinacea nestling deeper into the mainstream** A review article printed in the very traditional *Journal of Family Practice* confirms once again what many of us have known for some time: echinacea works. A series of 13 double-blind clinical trials proved the efficacy of echinacea as both a preventative defense against and effective treatment for upper respiratory infections.[Barrett, B, et al. Echinacea for upper respiratory infection. *J Family Practice*, 48:628-35]

Vitamin K - beyond blood clotting Recent findings suggest a link between vitamin K and stronger bones. Framingham Heart Study data collected between 1988 and1995 shows that elderly participants who consume greater quantities of this vitamin (up to 254 mcg/day) experience less hip fractures. *Vitamin K activates at least three proteins involved in bone health.* It is synthesized by bacteria in the intestines, unless bacterial activity has been supressed by antibiotics. Soybeans are considered one good food source of vitamin K, while dark green leafy and cruciferous vegetables can contain from 275-330 mcg per cup. [Booth SL, Tucker KL, Hannan CH, et al. Dietary vitamin K intakes are associated with hip fracture but not with bone mineral density in elderly men and women. *Am J Clin Nutr* 2000 May;71(5):1031-2]

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The major dietary source of methionine is animal protein - meat, fish, eggs, and dairy products. Vegan proteins - beans, legumes, seeds and nuts - provide secondary sources (see box at right). Eating methionine-rich protein foods inevitably results in the conversion of some methionine into homocysteine. Ideally, this homocysteine will be either reconverted back into methionine as necessary, or changed into cysteine, the other sulfur-containing amino acid needed by our bodies. (Sulfur has useful antioxidant properties.) Reconverting homocysteine into methionine requires *folic acid* and *vitamin B12*, while the enzyme used to convert homocysteine into cysteine depends on *vitamin B6*. Collectively, these three B-vitamins are called *homocysteine factors*.

The daily methionine requirement for a 150 lb adult is from 680[4]-883[5] mg. Many Americans take in twice that amount or more per day. Unless proportionally higher levels of vitamins B12, B6 and folate are also consumed, an excess of unconverted homocysteine may remain in circulation. Up to two thirds of individuals with high homocysteine levels are deficient in one or all of these three vitamins.[6]

## Reducing homocysteine levels

*Homocysteine factors* A simple blood test can determine if your homocysteine levels are too high (greater than 12 µmol/liter.[7]) If so, a multitude of studies have shown that increasing the intake of the three homocysteine factors can help bring levels down into the normal range. Eating foods rich in these vitamins is an important first step, but may not be sufficient. For example, in patients with ischemic heart disease, a daily dosage of at least 800 mcg of folic acid appears necessary for maximum reduction in serum homocysteine.[8] Other studies recommend up to 5 mg of folate and 50 mg of vitamin B6 to normalize levels.[9] In vegetarians and elderly people, vitamin B12 deficiency has been singled out as a leading cause of elevated homocysteine.[10,11] Clinical studies have recommended up to 1000 mcg of vitamin B12 three times a week to normalize levels.[12] Supplementing with the three homocysteine factors - either in a high potency multi-vitamin/mineral, comprehensive B-complex, or heart-specific formulation - is generally recognized as a cost-effective way to address this preventable risk factor for coronary heart disease events and death.[13]

*Antioxidants* have shown promise in controlling the blood thickening effects of high homocysteine without reducing levels directly. In one randomized controlled trial, healthy subjects were divided into three groups. The first group was given methionine only, the second group received methionine plus 800 IU of vitamin E and 1000 mg of ascorbic acid, the third group received a placebo with vitamins. After four hours, blood samples from the two groups who had received the methionine load showed a mild to moderate elevation in homocysteine levels. But only the first group, which had *not* received the antioxidant vitamins, exhibited a significant increase in levels of coagulation and adhesion molecules. This means that antioxidants counteracted the development of "sticky blood" associated with high homocysteine levels and inappropriate blood clots.[3]

*Behavior Modification* One's temperament may also affect homocysteine, as a prevalence of anger personality traits have been linked to high levels. In a recent study, a sample of healthy, middle aged men and women who tested high for anger and hostility on the *Cook-Medley* hostility questionnaire and the *Speilberger Anger Expression* questionnaire were all found to have elevated homocysteine levels.[14] The tendency to anger easily and often (anger proneness) is considered an independent risk factor for cardiovascular problems.[15] Now that this personality trait has been associated with high homocysteine levels, those wishing to prevent or control cardiovascular disease have even more reason to develop effective anger management strategies, and prioritize the cultivation of a calm and peaceful state of mind. (For helpful suggestions see Pioneer's *Easing Stress...Four Steps* .)


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## Methionine Content of Selected Foods

*Beans &Legumes, cooked*

| | |
|---|---|
| 1 c. black beans | 229 mg |
| 1 c. garbanzos | 190 mg |
| 1 c. lentils | 152 mg |
| 1 c. soybeans | 385 mg |
| 1 c. yellow beans | 244 mg |

*Dairy Products, Eggs*

| | |
|---|---|
| 1 c. whole milk | 201 mg |
| 1 c. skim milk | 210 mg |
| 1 c. cottage cheese | 789 mg |
| 1 c. cottage cheese, lowfat | 934 mg |
| 1 oz mozzarella | 154 mg |
| 1 oz mozzarella, skim | 192 mg |
| 1 oz aged cheddar | 185 mg |
| 1 egg, boiled | 196 mg |

*Poultry, Fish*

| | |
|---|---|
| 3.5 oz chicken, stewed w/skin | 657 mg |
| 3.5 oz chicken, stewed no skin | 755 mg |
| 3.5 oz roast turkey, dark meat | 774 mg |
| 3.5 oz roast turkey, white meat | 828 mg |
| 3 oz salmon | 498 mg |
| 2 sardines | 175 mg |

*Grains*

| | |
|---|---|
| 1 c. oatmeal, cooked | 101 mg |
| 1 c. whole wheat flour | 254 mg |
| 1 c. enriched flour | 229 mg |
| 1 c. brown rice, cooked | 102 mg |
| 1 c. white rice, cooked | 114 mg |

*Nuts & Seeds*

| | |
|---|---|
| 1 oz almonds, dry roasted | 53 mg |
| 1 oz sunflower seeds | 140 mg |
| 1 oz English walnuts | 80 mg |

The daily methionine requirement for a 150 pound adult is 680-883 mg.
Normal methionine metabolism produces homocysteine as an intermediate by-product.

## Framingham Study Reveals Link Between Homocysteine and Alzheimer's

The *Framingham Heart Study*, ongoing since 1948, has provided researchers with a wealth of data enabling the discovery of multiple risk factors for cardiovascular disease. Now, a new review of this landmark study has indicated an unexpected link between elevated homocysteine levels and dementia, particularly Alzheimer's disease.

Researchers from Boston University's School of Medicine examined the histories of 1,092 Framingham Study participants - 667 women and 425 men - with a mean age of 76 years. Homocysteine levels over an initial eight year period were examined in relation to the development of newly diagnosed dementia over a follow-up period averaging another eight years. Of the 111 subjects who developed dementia, 83 were diagnosed with Alzheimer's disease.

Consistently high levels of homocysteine were associated with increased incidence of dementia, while amounts greater than 14 µmol/liter nearly doubled the risk of Alzheimer's. Future clinical trials will show if intentionally reducing homocysteine levels can help to lower this risk. [*N Engl J Med* 2002; Feb 14;346(7):476-83]

# More Tidbits from Teri...

Vitamin D supplement recommended A review study on vitamin D concludes that physicians who encourage their patients to use sun protection to prevent skin cancer, should also encourage them to increase vitamin D intake, typically in the form of supplements. Vitamin D, a steroid prohormone, is normally formed when sunlight reacts with cholesterol in skin. It is important for bone health and blood pressure regulation, and has also been shown in numerous studies to act as a tumor suppressant. [Fuller KE, Casparian JM. Vitamin D: balancing cutaneous and systemic considerations *South Med J* 2001 Jan;94(1):58-64]

**Vitamin E helps heart surgery patients** Heart operations sometimes lead to their own set of problems. Surgically-induced free radicals such as sP-selectin can stimulate platelet aggregation (clotting) and lead to endothelial dysfunction. In hopes of preventing this effect, researchers from the Royal Surrey County Hospital in Guildford, UK gave 800 IU/day of vitamin E or placebo to patients awaiting coronary angioplasty for the month prior to their surgeries. Following surgery, the vitamin E group had significantly lower sP-selectin concentrations than the placebo group, and no significant worsening of platelet or endothelial function. The study concluded that *vitamin E may have a protective effect for angioplasty patients, and may possibly reduce the incidence of future coronary events.* [Ferns GA, Forster LA, Williams JC, et.al Effect of vitamin E supplementation on circulating cell-adhesion molecules pre- and post-angioplasty. *Ann Clin Biochem 2000 Sep*;37 (Pt. 5):649-54]

Cranberries inhibit growth of breast cancer cells Many of us are aware of the documented ability of cranberry juice to ward off and treat urinary tract infections. Now there's a new reason to include this fruit in your diet. Current research from the University of Western Ontario shows that cranberry extract can delay the incidence and spread of breast cancer tumors in mice. Scientists speculate that the rich concentration of *flavonoids* and *proanthocyanidins* in the deeply pigmented fruits may be responsible for their health-promoting benefits.[Guthrie, Najla Anti-breast Cancer Activity of Cranberry Juice and Products. *Presented at Experimental Biology* San Diego, CA April 18-21, 2000]

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tant to act preventatively as early in life as possible. But for millions of other folks, high blood pressure, clogged arteries and a weakened heart are already facts of life. I feel it is wise to include herbal medicines as part of a larger program of prevention and treatment of cardiovascular conditions.

The following chart explores common cardiovascular conditions and the herbs that have been found effective in their treatment.

## *HERBS TO CONSIDER FOR CARDIOVASCULAR CONDITIONS*

| | |
|---|---|
| **HYPERTENSION** | garlic, reishi, maitaki, olive leaf, green tea, hawthorn, mistletoe |
| **BLOOD VESSELS** | |
| • REDUCE TOTAL/LDL CHOLESTEROL & TRIGLYCERIDES | garlic, guggul, fo-ti, green tea, fenugreek, wild yam, red yeast rice |
| • ANTIOXIDANT PROTECTION AGAINST LDL CHOLESTEROL | green tea, turmeric, garlic, guggul |
| • IMPROVE STRENGTH OF BLOOD VESSEL WALLS | grape seed and pine bark extracts, hawthorn, bilberry |
| • IMPROVE BLOOD FLOW | (coronary vessels) hawthorn, khella; (peripheral circulation) ginkgo, garlic |
| • REDUCE STICKINESS OF PLATELETS | garlic, onion, turmeric, guggul, flax seed, fo-ti, reishi |
| **HEART DISEASE** | |
| • CONGESTIVE HEART FAILURE | hawthorn, ginkgo, garlic, cactus grandiflora |
| • ARRHYTHMIA (irregular heart beats) | hawthorn, cactus grandiflora, motherwort, scullcap, astragalus |
| • ANGINA (non-acute) | cactus, coleus, hawthorn, khella seed |
| • MITRAL VALVE PROLAPSE | hawthorn, cactus |
| • CARDIOTONICS | hawthorn, motherwort, rosemary, khella |

*Note: This chart is for educational purposes only. Before using herbs to treat any condition, learn about the specific qualities of each herb and check with a skilled health professional.* 

As you can see, it is important to determine specifically what heart issue you are trying to help, although there are herbs that have many benefits for both the heart and blood vessels.

### Hawthorn – an all-purpose heart protective and treatment

One of the most preeminent and widely prescribed heart remedies in Europe is hawthorn (*crataegus oxycantha* and other species). A shrub-like tree that can grow up to about 25 feet, hawthorn produces bunches of white flowers, red berries and large thorns. Some people believe the crown of thorns worn by Christ at his crucifixion was woven of hawthorn twigs. Hawthorn grows in the temperate zones of Europe, the US and Asia. It has been used for more than a century in the treatment of heart problems, and in historical folk medicine as a diuretic, for treatment of kidney and gallstones and as a mild sedative. Leaves, flowers and berries are all therapeutically useful parts of the plant.

Hawthorn's effectiveness is generally attributed to several *flavonoid* pigments including vitexin rhamnoside, and to *oligomeric proanthocyanidins (OPCs)*. It is thought that these flavonoids cause arterial relaxation and increase coronary artery blood flow to the heart muscle. They appear to block an enzyme, ACE (angiotensin-converting enzyme), that constricts blood vessels. Consequently, hawthorn can improve blood pressure, heart muscle nutrition and health, and pumping efficiency. It is highly recommended for people with mild to moderate congestive heart failure or cardiac insufficiency (categorized as New York Heart Association Stage II). Increased blood flow can help people with the chest pain of angina as well as with some forms of arrhythmias.

The OPCs in hawthorn are potent antioxidants and seem to help protect against the formation and oxidation of LDL cholesterol and subsequent plaque build up.

Hawthorn also appears to preserve collagen, a protein building material in connective tissue. Hawthorn's ability to reduce elastase, an enzyme that can break down elastic tissue, may help protect joints against wear and tear.

Hawthorn is most commonly taken as a tincture or powder. A therapeutic dose is between 300 and 750 mg per day, in divided dosages of a standardized extract containing at least 1.8% vitexin or vitexin-2'-rhamnoside. Hawthorn is slow-acting and may require a couple of months of use before best results are experienced.

Hawthorn is one of the safest herbal remedies for the heart. It has few if any side effects and appears to be safe when used with drugs prescribed for the heart. Since hawthorn can have a supportive interaction with other heart medications, using it over time may reduce one's need for other heart medicines. It is important to consult with experienced health professionals as one begins a heart healthy program that includes herbs.

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## *The general herbal rule:*

*Six days on, one day off.*
*Six weeks on, one week off.*
*Six months on, one month off.*

Traditional practitioners often recommend interspersing long-term herbal treatment with regular pauses. They say this helps the body to gently realign itself and integrate the benefits offered by the herbs.

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**PIONEER NUTRITIONAL FORMULAS, INC.** 304 Shelburne Center Road, Shelburne Falls, MA 01370 • 800.458.8483 • Fax 413.625.9619
www.pioneernutritional.com