

Special Interest Articles:

- CAN BROCCOLI PROTECT YOU FROM THE SUN?
- CAFFEINE MAY INCREASE BLOOD SUGAR
- CoQ₁₀
- COQ10 AND ATHLETES
- WALNUTS AND DIABETES
- RIBOSE AND HEART FAILURE

Green Tea and Atherosclerosis

Blood vessels are lined with cells called the endothelia. A recent study, appearing in *Circulation Journal* (2010 Feb 4; [Epub ahead of print]) looked at the effect antioxidants, known as green tea catechins (GTC) had on the blood vessel lining of 30 smokers with no major health complaints. The subjects were randomly placed into one of three groups. For two weeks, one group received 80 mg of GTC per day, a second received 580 mg of GTC per day and the third group received a placebo. In the group receiving the higher dose of GTC, there was an

increased response to acetylcholine and sodium nitroprusside (increasing blood flow in the forearm). The increase showed that a high dose of GTC actually improve circulation. Furthermore, there was an increase in nitric oxide in that group (a vasodilator). In addition, there was a decrease in chemicals, like c-reactive protein, that are involved with inflammation. These improvements were not experienced by the placebo group or the group taking the low dose of GTC.

Acetaminophen and Liver Damage

ALT stands for alanine aminotransferase; it is a substance that is released into the blood when liver cells are damaged. ALT levels in the serum will give you an idea if there is any liver cell damage occurring. A randomized, single-blind, placebo-controlled, 5-treatment, parallel-group, inpatient, diet-controlled (meals provided), longitudinal study of 145 healthy adults, appearing in the *Journal of the American*

Medical Association (Vol. 296 No. 1, July 5, 2006) indicates that acetaminophen use, even a recommended doses, causes liver damage. The subjects were given either four grams of acetaminophen (the maximum recommended daily dose) or a placebo for 14 days. The use of the acetaminophen increased ALT levels to nearly five times normal in 19% of the participants. No such increases were noted in the placebo group

Can Broccoli Protect You From the Sun?

Sulforaphane does not absorb UV rays, but helps the cells' defense against sun damage. The extract somehow enhances the activity of proteins that are part of the cell's defensive system. ACTH.

Research appearing in the *Proceedings of the National Academy of Sciences of the United States of America* (2007 Oct 30;104(44):17500-5. Epub 2007 Oct) found that the topical application of a broccoli extract may protect from UV rays. The research, performed at Johns Hopkins University School of Medicine found that the extract, called sulforaphane, works differently from traditional sunscreens.

The researchers measured the reddening and inflammation caused by the UV rays. The broccoli extract reduced the reddening of the skin (erythema) by over 37%. In addition, the protective effect lasted long after

the extract had been applied. Three days after the application of the extract, subjects still experienced a reduction in skin reddening when exposed to UV radiation.

Sulforaphane does not absorb UV rays, but helps the cells' defense against sun damage. The extract somehow enhances the activity of proteins that are part of the cell's defensive system. That defensive system acts to inhibit carcinogens, helps dispose of damaged, potentially cancerous cells, and suppresses the inflammatory response. The reason the broccoli extract works for several days after application is that it does not merely block UV rays, it actually enhances the health of the cells.

Caffeine May Increase Blood Sugar

A study published in the February, 2008 issue of *Diabetes Care* indicates that consuming caffeine may make it difficult to control blood sugar levels. It was a small study, involving 10 subjects with type-2 diabetes. The subjects managed their diabetes with diet and took no drugs.

The subjects were able to choose their food for lunch and dinner, but were given a nutrient drink for breakfast. They were all fitted with a monitor that continually measured their blood sugar over a three day period. On one day they were given

caffeine capsules (equivalent to four cups of coffee) and on the other days they were given a placebo.

The caffeine increased the amount of glucose in the blood immediately after meal by an average of 9% after breakfast, 15% after lunch and 26% after dinner. Overall, the average amount of sugar in the blood went up about 8% on the day of caffeine consumption.

CoQ10

Coenzyme Q₁₀ (called Co Q₁₀ for short) is also known as ubiquinone. The letter Q refers to quinone, which is a chemical group derived from aromatic rings. The number 10 refers to the 10 isoprene (CH₂=C(CH₃)CH=CH₂) units attached to the molecule.

CoQ₁₀ is found in all of the cells of all mammals--including you. It is found primarily in the mitochondria; mitochondria are organelles that exist in the cell and are responsible for producing energy for the cell. Co Q₁₀ is vital to the electron transport chain--which is a series of chemical reactions that the cell uses to produce energy. CoQ₁₀ is found in high levels in cells that require a lot of energy, like the cells of the heart, liver and kidney. CoQ₁₀ is fat-soluble and also acts as an antioxidant.

Because tissues that need to produce a lot of energy require a lot of CoQ₁₀, supplementation tends to benefit those with cardiac problems. A double-blind, placebo-controlled study appearing in the *European Heart Journal* (2006 November;27(22):2675-81) looked at 23 subjects with stable, chronic heart failure. The study had four phases. In the first phase the subjects were given 300 mg of CoQ₁₀ per day. In phase two, they received the supplement and supervised exercise training. In the third phase they received a placebo and in the final phase they received exercise training along with the placebo. The researchers found that the CoQ₁₀

supplementation improved the ability of cardiac arteries to dilate. It also improved the contractility of the left ventricle and generally improved the heart's functional capacity. The benefits of the supplementation were enhanced by exercise. This supports earlier studies. Coenzyme Q₁₀ has been shown to be of value in patients with heart failure according to earlier research appearing in the journal *Biofactors* (2006; 25(1-4): 137-45) and the *European Heart Journal* (August 1, 2000).

Research appearing in *Clinical Investigator* (1993;71:S 145-S 149) showed that 54% patients receiving three months of coenzyme Q₁₀ supplementation (between 50 and 150 milligrams per day) had improvements in at least three symptoms of heart failure. Large percentages of patients experienced improvements with 81% having less cyanosis, 76.9% with less edema, 54% having less shortness of breath, 62% having less arrhythmia and 73% having less vertigo. Also, the severity of symptoms correlate with low coenzyme Q₁₀ levels, according to research that appeared in the *International Journal of Tissue Reactions* (1990;12(3):155-162).

It is also worth noting that taking cholesterol-lowering medication depletes Co Q₁₀. It may be beneficial to your heart and health to take Co Q₁₀ as a supplement.

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Mercury Fillings

Mercury fillings have been around since around 1890. In the early 1900s, German chemist, Alfred Stock warned of mercury toxicity from the fillings. So the mercury fillings and the controversy surrounding them are not new. Mercury fillings contain 50 parts mercury, 35 parts silver and 10 parts tin, copper and zinc. In spite of the propensity of the dental profession to call amalgam fillings "silver", more than 50% of the material in them is mercury, which is toxic.

The American Dental Association has long held the position that amalgam fillings became inert after a few days and were therefore safe. Currently the ADA recognizes that there is some absorption from amalgam fillings, but still holds the position that amalgams are safe. The FDA recommends not placing mercury fillings in children under the age of six. The FDA has produced a lengthy report (posted on its website) that discusses the amount of mercury absorbed from fillings, the effects of mercury toxicity and methods of testing. The report cites a study performed at the University of Tübingen Health Clinic, involving 20,000 subjects with mercury fillings. On average the amount of mercury found in saliva was 11.6 mcg/L; however, gum chewing could triple that figure. Also, those subjects with multiple fillings tended to have higher levels. Some subjects had extremely high levels, with 1% having more than 200 mcg/L and 10% having more than 100 mcg/L.

According to research appearing in the *Journal of Dental Research* (1992;71(AADR Abstracts);284/1424), polishing fillings increased the mercury released from the fillings. A filling with a surface area of 25 square millimeters released over 3x more mercury vapor after being polished.

A study appearing in the *Archives of Environmental Health* (May/June, 1996;51(3):234-241) evaluated the amount

of mercury in blood, hair and breast milk in 30 Swedish women six weeks after giving birth. Researchers found that the amount of inorganic mercury in the blood and breast milk correlated with the number of mercury fillings. The exposure of infants to mercury from breast milk was found to be about half of the tolerable daily intake for adults, as recommended by the World Health Organization.

Research appearing in *Biological Trace Element Research* (1997;56:143-152) looked at mercury absorption from amalgams in pregnant sheep. Three ewes were given 12 mercury amalgams, containing radioactive mercury, while three other ewes (not given amalgam fillings) acted as controls. The lambs born of the ewes with the fillings had mercury (which was found primarily in the liver). Breast feeding provided the newborn lambs with additional mercury, found primarily in the kidney. It has long been noted that mercury crosses the placenta and into the fetus. Mercury also crosses into breast milk.

Cadavers were examined in research appearing in the *Journal of Prosthetic Dentistry* (1987;58(6):704-707) to find the relationship between the number of amalgam fillings and the presence of mercury in nerve tissue. The data showed a positive correlation between the number of fillings and the amount of mercury found in brain tissue. Clearly there is a relationship between mercury fillings and the absorption of mercury into the body. Also, the amount absorbed seems to vary between patients, but there is a correlation between the number of fillings and the amount of mercury absorbed. More of a concern is that mothers can pass the mercury on to the fetus.

Are Walnuts Good for Diabetics?

A randomized, controlled, single-blind study appearing in *Diabetes Care* (2009 Oct 20; [Epub ahead of print]) looked at the relationship between walnut consumption and cardiovascular health in diabetics. The mean age of the 24 subjects was 58, and they were all type 2 diabetics. The subjects underwent testing of their vascular endothelium (cells lining the blood vessel walls) by measuring flow-mediated dilation.

Flow mediated dilation (FMD) is a method used to diagnose early stages

of atherosclerosis. Problem with the endothelium (lining of the blood vessels) is considered to be one of the early signs of atherosclerosis; and that is measured with FMD.

The subjects were placed on either an ad libitum diet or an ad libitum diet supplemented with 56 grams of walnuts per day. At the end of eight weeks, it was found that the group receiving the walnuts had improved endothelial function as measured by FMD.

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Athletes and CoQ10

A study appearing in the *British Journal of Nutrition* (2008, 100: 903-9097) looked at coenzyme Q10 supplementation and muscle damage after intense exercise. This was a double-blind, placebo controlled study involving 18 athletes who were given either 300 mg of CoQ10 or a placebo for 20 days. During the course of the study they exercised intensely for 5 1/2 hours each day for six days. Blood tests were taken to indicate the level of muscle damage (myoglobin, and creatine kinase). The muscle damage indicators increased in both groups, but were significantly lower in the group receiving the CoQ10.

Another double-blind, placebo-controlled study, appearing in the *Journal of the International Society of*

Sports Nutrition (2008; 5(1): 8) looked at CoQ10 supplementation and athletic performance. The participants of the study were 22 trained athletes and 19 untrained subjects. An hour before a series of exercise tests they were randomly given either a placebo or 200 mg of Coenzyme Q10. Blood samples and muscle biopsies were taken before and after exercise. The subjects were then given either a placebo or 100 mg of Coenzyme Q10 twice each day for a period of two weeks. At the end of the period they performed the same exercises and were tested in the same way. A trend for increased time to exhaustion was observed following 2 weeks of CoQ10 supplementation.

Ribose and Heart Failure

A wise man should consider that health is the greatest of human blessings, and learn how by his own thought to derive benefit from his illnesses.—

Hippocrates

One possible way to address congestive heart failure is to improve the production of energy of the heart muscle cells. In heart failure, the heart is literally energy starved. Ribose is a five carbon sugar that is part of the ATP molecule (adenosine triphosphate). Taking ribose may be a way to increase the energy production of the heart cells, according to an article in *Progressive Cardiovascular Nursing* (2009 Jun;24(2):59-60).

Animal studies have shown the value of d-ribose to heart function. A study that appeared in *Science* (1983 Apr 1;220(4592):81-2) Another study, that appeared in *Cell Physiology and Biochemistry* (2009;24(3-4):211-8. Epub 2009 Aug 3) found that rats who were given an IV infusion of d-ribose (200 mg/kg/h) one day prior to the induction of a myocardial infarction. When compared to the control group, rats treated with ribose had a smaller area of infarction and better left ventricle function. Another study on rats that appeared in *Progressive*

Cardiovascular Nursing (2009 Jun;24(2):59-60) found that ribose normalized depressed heart function in rats.

There have been some small clinical trials. Research that appeared in the *European Journal of Heart Failure* (2003 Oct;5(5):615-9) found that ribose supplementation improves ischemic threshold and enhances diastolic function in congestive heart failure. The small study showed improvement to patients' quality of life and improvement of cardiac function with ribose supplementation. Another small study that was published in the *International Journal of Cardiology* (2009 Sep 11;137(1):79-80. Epub 2008 Jul 31) looked at 16 patients with class III or class IV heart failure. They were given five grams of ribose three times each day. At the end of eight weeks, all patients had a significant improvement in ventilatory parameters at anaerobic threshold, along with a 44% Weber class improvement. Ribose improved the ventilatory exercise status in advanced heart failure patients.

