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For Stronger Bones, Consider Drinking a Glass of Mineral Water or a Cup of Tea

Getting enough calcium and other bone-building nutrients may be as easy as having a glass of mineral water or sipping a cup of tea. That's good news for people who have allergies to milk or prefer to limit their intake of high-calorie dairy products.

In one study, Josette Guillemant, PhD, of the faculty of medicine at the Pitie-Salpetriere School of Medicine, Paris, asked 12 healthy young men to consume about a pint of mineral water with either a high or low concentration of calcium. The high-calcium mineral water contained 172 mg of calcium.

She then measured blood levels of parathyroid hormone and urine levels of a particular peptide to assess the breakdown of bone tissue. High levels of parathyroid hormone promote calcium loss from bones, and the particular peptide measured indicates the rate of bone turnover and loss.

Guillemant reported that blood levels of parathyroid hormone declined by one-third after the men consumed the calcium-rich mineral water, indicating that the calcium-leaching hormone had been suppressed. In addition, urine levels of the peptide decreased by one-third, a sign that calcium loss had slowed significantly.

Guillemant concluded that "high-calcium mineral water not only represented an additional dietary source of calcium but also modulated parathyroid function and bone metabolism."

In a second study, Kay-Tee Khaw, MBBChir (British degrees in medicine), of the Cambridge University School of Medicine, England, analyzed the relationship between bone mineral density and tea drinking among 1,134 elderly women.

Previous studies have linked caffeine consumption to bone loss, but most of these studies investigated coffee as a source of caffeine. "Tea contains a different pattern of nutrients (e.g., flavonoids) than does coffee, which may have other potential effects on bone," wrote Khaw.

As it turned out, older women who drank tea had high bone mineral density, compared with women who did not drink tea. The association between tea and bone mineral density was not affected by adding milk to tea, coffee drinking, smoking, or the use of hormone-replacement therapy. Nor was the association related to the number of cups of tea consumed per day.

"Nutrients found in tea, such as flavonoids, may influence bone mineral density," wrote Khaw. "Tea drinking may protect against osteoporosis in older women."

References: Guillemant J, Le H-T, Accarie C, et al. Mineral water as a source of dietary calcium: acute effects on parathyroid function and bone resorption in young men. American Journal of Clinical Nutrition, 2000;71:999-1002. Hegarty VM, May HM, Khaw K-T. Tea drinking and bone mineral density in older women. *American Journal of Clinical Nutrition*, 2000;71:1003-1007.

Perspectives...

RDI Committee Ignores the Research

The vitamin news last month was confusing and disturbing.

Researchers from the National Academy of Sciences announced new Dietary Reference Intakes (DRIs) for antioxidants, replacing the old Recommended Dietary Allowances (RDAs).

The good news was that the recommendations for vitamins C and E increased by about 50 percent: the new DRI for vitamin C is now 90 mg daily for men and 75 mg for women, and the new DRI for vitamin E is 15 mg (22 IU) for both men and women.

The bad news was that, in light of considerable positive research on these vitamins, the new recommendations are next to meaningless. The DRIs were conceived as a way to prevent chronic diseases, but the dosages will do little more than prevent rare nutrient-deficiency diseases, such as scurvy.

Worse still, the news of the DRI increases was buried under frightening headlines that large

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amounts of vitamins C and E could be dangerous. This "spin" began with the news release issued by the antioxidant committee and was repeated by newspapers around the country. One can only assume that the committee wanted to scare people from taking supplements of vitamins C and E—and, in effect, to condemn people to a higher risk of chronic diseases.

In talking with some members of the antioxidant committee, I was told that many of the members just wanted to "cover their assess." The committe report was, after all, a costly and unproductive bureaucratic exercise.

If the antioxidant committee had actually wanted to be socially responsible scientists, they would have recommended 500-2,000 mg of vitamin C and 200-400 IU of natural vitamin E daily. These are safe dosages, supported by overwhelming research, for the vast majority of people. — *Jack Challem*

Ginseng Supplements Lower Blood Sugar, May Help Control Diabetes

Ginseng supplements may improve glucose tolerance in diabetics—and could conceivably help prevent diabetes in healthy people.

Vladimir Vuksan, PhD, of the University of Toronto, gave supplements containing 3 grams of American ginseng (*Panax quinquefolius*) to nine subjects with Type II diabetes and to ten healthy subjects. They took the ginseng either with a 25-gram glucose-tolerance test (to mimic a high-sugar meal) or 40 minutes before drinking the sugar solution.

Normally, blood sugar levels rise after a meal, then gradually decline. In diabetics, blood sugar levels rise sharply and decline very slowly.

The ginseng had a powerful glucose-lowering effect on both diabetic and nondiabetic subjects, with an 18-20 percent reduction "under the glycemic curve," according to Vuksen.

Among the diabetic subjects, blood sugar levels declined when ginseng was taken both before and during the glucose-tolerance test. Among healthy subjects, ginseng lowered blood sugar levels when it was taken before the glucose-tolerance test, but not when it was taken with the test.

Vuksan noted that other studies of ginseng typically used 1.5 grams or less. "Our rationale for using a higher dose was based on traditional medical practices," he wrote. "In Asian medicine, herbs are treated much like diluted drugs..."

He cited two recent studies showing that people eating diets with a low glycemic index (GI) – that is, foods that did not trigger a rapid elevation of glucose and insulin – were less likely to develop diabetes. "If ginseng can lower the glycemic response to glucose, then it may be possible to use it as a means for lowering the GI of the whole diet, thereby improving glycemic control," Vuksan wrote.

He added that ginseng may have a role in preventing diabetes in healthy people. However, he recommended that diabetics take the herb with meals to avoid a hypoglycemic reaction.

Ginseng appears to work by stimulating insulin secretion and glucose transport into cells.

Reference: Vuksan V, Sievenpiper JL, Koo VYY, et al. American ginseng (*Panax quinquefolius L*) reduces postprandial glycemia in nondiabetic subjects and subjects with type 2 diabetes mellitus. *Archives of Internal Medicine*, 2000;160:1009-1013. ▯

Lutein Supplements Lead to Improved Vision in People with Eye Disease

Lutein, a carotenoid that reduces the risk of macular degeneration, may provide far broader benefits to vision.

Gislin Dagnelie, PhD, of the Johns Hopkins University School of Medicine, studied 26 subjects, ages 27-54, with retinitis pigmentosa or other types of degenerative retinal diseases. Sixteen of the subjects took 40 mg of lutein daily for nine weeks, followed by 20 mg daily for another 17 weeks. Ten other subjects took lutein, plus 500 mg of docosahexaenoic acid (DHA), B vitamins, and digestive enzymes.

Using vision tests and the subjects' own observations, visual acutity and field of vision improved significantly – by 80 percent among some subjects – after taking the lutein supplements. "The effects first became noticeable between 2 and 4 weeks after the start of lutein supplementation, and plateaued after 6 to 14 weeks," Dagnelie wrote.

Subjects with blue eyes had four-fold improvements in visual acuity, compared with dark-eyed subjects.

People taking lutein also reported improved color recognition, faster adaptation to light and dark, and reduced glare from artificial lights and sunlight.

Lutein is found in kale, spinach, and broccoli.

Reference: Dagnelie G, Zorge IS, McDonald TM. Lutein improves visual function in some patients with retinal degeneration: a pilot study via the internet. *Optometry*, 2000;71:147-164. ▯

Vitamin C May Help Protect Women Against Gallstone Formation

New research adds to the growing body of evidence indicating that vitamin C – from food or supplements – can reduce the chances of developing gallstones and other types of gallbladder disease.

Joel A. Simon, MD, and Esther S. Hudes, PhD, of the University of California, San Francisco, analyzed dietary and health data for more than 13,000

people participating in the Third National Health and Nutrition Examination Survey.

Overall, women consuming the greatest amount of vitamin C had a 39 percent lower risk of developing gallstones. In addition, women consuming large amounts of vitamin C had a 33 percent lower risk of having asymptomatic gallstones.

By themselves, vitamin C supplements were associated with a 34 percent lower prevalence of gallstones, but had no apparent effect on asymptomatic gallstones. Nor did vitamin C influence the risk of gallstones in men.

Vitamin C is needed to activate cholesterol 7 a-hydroxylase, an enzyme that breaks down cholesterol into bile acids. In animal studies, a lack of vitamin C decreases the activity of this enzyme and increases the formation of gallstones, which are rich in cholesterol. Vitamin C can increase the enzyme's activity by 15 times.

Reference: Simon JA and Hudes ES. Serum ascorbic acid and gallbladder disease prevalence among US adults. *Archives of Internal Medicine*, 2000;160:931-936. □

Carotenoids May Help Maintain Normal Lung Function in Seniors

The lungs are one of the body's direct interfaces to the environment and, as a consequence, are routinely exposed to damaging free radicals in air pollution.

"Elderly individuals may be particularly vulnerable for low levels of antioxidant vitamins in relation to lung function, as exposure to free radicals is increased and obstructive pulmonary disease is an important cause of disability and death in old age," wrote Linda Grievink, PhD, and her colleagues at Wageningen Agricultural University, Netherlands.

Although research on beta-carotene has shown conflicting effects on lung cells, a new study by Grievink suggests that a mix of carotenoids, including beta-carotene, may contribute to normal lung function during aging.

Grievink and her colleagues measured blood levels of multiple carotenoids – alpha-carotene, beta-carotene, lycopene, cryptoxanthin, zeaxanthin, and lutein – in 528 people ages 65-85 years old. Grievink and her associates also measured the subjects' lung function with standard tests known as "forced expiratory volume in one second (FEV1)" and "forced vital capacity (FVC)."

They found that seniors with high blood levels of beta-carotene and alpha-carotene had significantly better lung function as measured by FVC, compared with people who had low levels of these nutrients. Similarly, people with high blood levels of alpha-carotene, beta-carotene, and lycopene had better lung function as measured by FEV1. The other carotenoids were not associated with lung function.

Reference: Grievink L, de Waart FG, Schouten EG, et al, "Serum carotenoids, a-tocopherol, and lung function among Dutch elderly," *American Journal of Respiratory and Critical Care Medicine*, 2000;161:790-795. □

Prescription Form of Niacin Works Better than Cholesterol-Lowering Drug

It was back in 1955 that Abram Hoffer, M.D., Ph.D., discovered that the niacin form of vitamin B3 could lower cholesterol levels. Unfortunately, niacin has often taken a back seat to higher priced and more aggressively marketed pharmaceuticals.

That may change with a new form of niacin, available by prescription. Known by the trade name Niaspan, this extended-release niacin works far better than a common cholesterol-reducing drug, according to the results of a recent study.

John R. Guyton, MD, of the Duke University School of Medicine, led a team of researchers who gave 140 patients either Niaspan, gemfibrozil (Lopid), or a placebo daily for 16 weeks. At low dosages, Niaspan raised levels of the "good" high-density lipoprotein (LDL) form of cholesterol only slightly better than did gemfibrozil.

However, when Guyton increased the daily dosage of Niaspan to 1,500 mg, HDL levels went up by 21.4 percent, in contrast to a 14 percent increase with gemfibrozil (1,200 mg). And when Niaspan was increased to 2,000 mg daily, HDL levels went up by 26 percent—double the 13.3 percent achieved with 1,200 mg of gemfibrozil.

Another positive effect was that Niaspan increased levels of apoprotein A-1, the major protein of HDL, by 11.2 percent. It also reduced lipoprotein(a) levels, another risk factor for cardiovascular disease, by 20 percent, whereas gemfibrozil had no effect.

Gemfibrozil raised levels of the "bad" low-density lipoprotein (LDL) by a significant 8.6 percent, whereas Niaspan had no significant effect on LDL. But gemfibrozil did lower triglyceride levels significantly more than did Niaspan, by 40 percent versus 29 percent.

The only negative effect of Niaspan was the flushing and tingling sensation chararacteristic of niacin.

Reference: Guyton JR, Blazing MA, Hagar J, et al. Extended-release niacin vs gemfibrozil for the treatment of low levels of high-density lipoprotein cholesterol. *Archives of Internal Medicine*, 2000;160:1174-1184. □

Quick Reviews of Recent Research

• Vitamin E may help in sickle cell disease

In a study of 28 Malawian children, researchers noted that 12 (42.8 percent) had vitamin E blood levels that were below normal. Their low vitamin E levels may have been a consequence of sickle cell disease or poor nutrient intake. The researchers explained that red blood cells from people with sickle cell anemia are highly susceptible to free radical damage, and that vitamin E might help protect blood cells.

Shukla P, et al. *Transactions of the Royal Society of Tropical Medicine*, 2000;94:109.

• High iron levels exacerbate stroke

Researchers analyzed blood and spinal fluid levels of ferritin, indicative of the total amount of iron in the body, in 100 patients who had suffered a stroke. Patients with the highest blood ferritin levels were 33.5 times more likely to suffer from severe brain damage after a stroke. High iron levels may increase damage by generating free radicals and glutamate.

Davalos A, et al. *Neurology*, 2000;54:1568-74.

• NSAIDS boost heart failure risk

In an analysis of 1,000 elderly patients, researchers found that use of nonsteroidal antiinflammatory drugs (other than aspirin) doubled the risk of hospitalization for heart failure. Among seniors with a history of heart disease, the regular use of NSAIDS was associated with a 10-time greater risk of hospitalization for heart failure. The researchers calculated that NSAIDS might account for 19 percent of hospital admissions for heart failure, and that the "disease burden" associated with these drugs may be comparable to that of the serious gastrointestinal complications NSAIDS can cause.

Page J, Henry D. *Archives of Internal Medicine*, 2000;160:777-784.

• Pycnogenol® has antiinflammatory properties

Inflammation in a component of many skin disorders, including psoriasis, atopic dermatitis, and lupus erythematosus. In a cell-culture experiment, researchers found that interferon increased production of adhesion molecules, which encouraged immune cells to stick to skin cells. The addition of Pycnogenol® stopped production of adhesion cells and prevented immune cells from adhering to skin cells. In a person this inhibitory effect would reduce inflammation.

Bito T, et al. *Free Radical Biology & Medicine*, 2000;28:219-227.

• Soy lowers cholesterol levels

In a review of studies on soy and heart disease, a researcher noted that soy protein, containing isoflavones, can reduce the low-density lipoprotein (LDL) form of cholesterol by about 13 percent and triglycerides by about 10 percent. Other evidence indicates that soy can lower blood pressure and improve vascular function.

Anthony MS. *Journal of Nutrition*, 2000;130: 662S-663S.

• Vitamin E supplements block LDL uptake

Oxidation of the low-density lipoprotein (LDL) form of cholesterol is an early step in the development of coronary artery disease. White blood cells engulf oxidized LDL, then become stuck in artery walls. Three of seven patients scheduled for heart surgery were given 900 mg of vitamin E daily for four weeks. In these patients, white blood cells absorbed virtually no LDL.

Iuliano L, et al., *Circulation*, 2000;101:1249-1254.

• Vitamin B6 and magnesium ease PMS symptoms

Researchers asked 44 women to take 50 mg of vitamin B6 and 200 mg of magnesium oxide to determine their effect on premenstrual symptoms. Together, the two nutrients eased anxiety symptoms, including nervous tension, mood swings, and irritability. However, the researchers noted that magnesium oxide was not well absorbed.

De Souza MC, et al. *Journal of Womens Health & Gender-Based Medicine*, 2000;9:131-139.

• Alpha-lipoic acid reduces cadmium toxicity

The naturally occurring antioxidant alpha-lipoic acid can aid recovery from heavy metal poisoning, primarily by chelating toxic metals. In an animal study, researchers found that alpha-lipoic acid greatly reduced the toxicity of cadmium, but it did not remove cadmium from tissues. The researchers concluded that alpha-lipoic acid decreased cadmium toxicity through its antioxidant properties.

Bludovska M, et al. *General Physiology and Biophysics*, 1999;18:28-32.

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