

# The Nutrition Reporter™

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## New Findings Suggest that Some B Vitamins May Protect Against Alzheimer's Disease

High blood levels of homocysteine – an indicator of low levels of several B vitamins – have long been associated with an increased risk of coronary artery disease and stroke. Now, researchers report that elevated homocysteine levels can often predict a person's risk of Alzheimer's disease.

Homocysteine is a normal byproduct of protein metabolism. However, its level in the blood can increase when people do not consume enough B vitamins relative to the amount of protein they eat. In addition, common genetic defects can interfere with the body's use of folic acid, a B vitamin, resulting in higher homocysteine levels.

Researchers know that homocysteine damages blood vessel walls. Folic acid, vitamin B6, and vitamin B12 help break down homocysteine or recycle it back to methionine, a building block of protein.

In the latest study, Sudha Seshadri, MD, and his colleagues at Boston and Tufts universities measured homocysteine levels in 1,092 elderly men and women during the late 1970s and early 1980s and again in the late 1980s. During an average of eight years follow-up, with some patients tracked for up to 13 years, 111 of the subjects developed dementia. Probable Alzheimer's disease was diagnosed in 83 of the cases.

Subjects with the highest levels of homocysteine – more than 14 micromoles per liter of blood – were almost twice as likely to develop Alzheimer's disease or some other form of dementia, compared with subjects who had the lowest homocysteine levels. Overall, relatively modest increases in homocysteine levels raised the risk of Alzheimer's or other dementia by 40 percent.

The researchers did not find a strong relationship between blood levels of folic acid and vitamins B6 and B12 and the risk of Alzheimer's disease. However, this could suggest that the subjects had greater B-vitamin requirements because of age or inherited defects affecting B-vitamin metabolism.

A separate study conducted by American and Italian researchers also found that elevated homocys-

teine levels were common in patients diagnosed with dementia. One-fifth of the subjects had a genetic defect interfering with folic acid metabolism, although the same defect occurred to almost the same extent among healthier control subjects.

The researchers noted that such a genetic defect, when combined with low folic acid levels, could increase homocysteine levels and the risk of Alzheimer's disease.

References: Seshadri S, Beiser A, Selhub J, et al. Plasma homocysteine as a risk factor for dementia and Alzheimer's disease. *New England Journal of Medicine*, 2002;346:476-483. Bottiglieri T, Parnetti L, Arning E, et al. Plasma total homocysteine levels and the C677T mutation in the methylenetetrahydrofolate reductase (MTHFR) gene: a study in an Italian population with dementia. *Mechanisms of Ageing and Development*, 2001;122:2013-2023. □

### Common Anesthetic Can Boost Homocysteine, Lower B Vitamin Levels

Since the mid-1990s, several studies have found that nitrous oxide, a widely used anesthetic, can significantly reduce blood levels of vitamin B12, at times even causing B12 deficiencies. Consistent with this, some researchers have reported that nitrous oxide increases blood levels of homocysteine, which may boost the risk of heart attack after general anesthesia and nonheart surgeries.

Because B vitamins are well established for their ability to lower homocysteine levels, Neal H. Badner, MD, and his colleagues at the University of Western Ontario, London, investigated whether supplements would prevent the rise in homocysteine levels after surgery.

Badner and his colleagues gave either B-vitamin supplements or placebos to 39 patients for one week before they underwent knee or hip surgery. The supplements contained 2.5 mg of folic acid, 25 mg of vitamin B6, and 500 mcg of vitamin B12.

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The subjects taking placebos had an average 15 percent increase in their homocysteine levels after surgery. In contrast, those taking the B vitamins had an average decrease of 9 percent in their postsurgical homocysteine levels.

Reference: Badner NH, Freeman D, Spence JD. Preoperative oral B vitamins prevent nitrous oxide-induced postoperative plasma homocysteine increases. *Anesthesia and Analgesia*, 2001;93:1507-1510. □

## Researchers Report that Vitamin E May Ease Menstrual Cramping in Teenagers

Painful cramping during monthly menstrual periods may affect as many as three-fourths of all teenage girls. But according to a recent study of Iranian teenagers, vitamin E supplements may reduce what is technically known as dysmenorrhea.

The researchers, with Tarbiat Modarres University, Tehran, gave 50 teenagers, 16 to 18 years old, five 100 IU vitamin E capsules daily, starting two days before their menstrual periods began and continuing for another three days after their periods started. Another 50 teenagers were given placebos. The supplements and placebos were also given at the start of the following menstrual period.

On average, girls receiving vitamin E supplements had a 36 percent reduction in pain. Those taking placebos had only a 20 percent improvement.

The researchers wrote that vitamin E probably reduced levels of hormone-like prostaglandins involved in menstrual pain.

Reference: Ziaei S, Faghihzadeh S, Sohrabvand F, et al. A randomized placebo-controlled trial to determine the effect of vitamin E in treatment of primary dysmenorrhoea. *British Journal of Obstetrics and Gynaecology*, 2001;108:1181-1183. □

## Coenzyme Q10 Supplements Help Some People Lower Their Blood Pressure

Large dosages of supplemental coenzyme Q10, a vitamin-like nutrient, have been shown to benefit many people with serious forms of heart disease, such as cardiomyopathy and heart failure. Now researchers report that modest dosages of CoQ10 may help some people reduce their blood pressure.

The findings are significant. More than 50 million adult Americans have hypertension, and it is one of the most common risk factors for more serious heart disease and stroke.

Briant E. Burke, MD, and his colleagues at the Veterans Affairs Medical Center, Boise, Idaho, used either CoQ10 or placebos to treat 76 elderly men and women with isolated systolic hypertension. This particular form of hypertension accounts for two-thirds of the hypertensive patients over age 65.

Burke and his colleagues gave the subjects 60 mg of CoQ10 (in the form of hydrosoluble Q-Gel capsules) twice daily or placebos for 12 weeks. Both the CoQ10 and placebos also contained 150 IU of vitamin E, an amount not believed to influence blood pressure. Subjects began taking the supplements and placebos after a 10-day "washout" period, during which they discontinued taking any hypertensive medication.

Overall, people taking the CoQ10 had almost an 18 mmHg decrease in systolic blood pressure. Patients taking placebos had negligible reductions in blood pressure, and none of the subjects had declines in diastolic blood pressure.

However, on further analysis of the data, Burke and his colleagues found that 55 percent of the patients responded to CoQ10, but 45 percent did not. On average, the patients responding to CoQ10 had declines of almost 26 mmHg in blood pressure.

Reference: Burke BE, Neuenschwander R, Olson RD. Randomized, double-blind, placebo-controlled trial of coenzyme Q10 in isolated systolic hypertension. *Southern Medical Journal*, 2001;94:1112-1117. □

## Higher Selenium Levels Protect Against Cancer in Men and Lab Animals

Several studies, some dating back more than 30 years, have found that selenium can reduce the risk of prostate cancer and other types of cancer. Two recent studies add considerably to the anticancer properties of selenium.

Selenium is part of several antioxidant enzymes called glutathione peroxidases. These enzymes help break down cancer-causing chemicals, as well as neutralize dangerous free radicals.

In the first study, James D. Brooks, MD, and his colleagues at Stanford and Johns Hopkins universities, analyzed blood levels of selenium in 52 men with prostate cancer and 96 men free of the disease.

As the men's blood levels of selenium increased, their risk of prostate cancer decreased. Men with the highest blood levels of selenium were 76 percent less likely to develop prostate cancer, compared with those who had the lowest levels of the mineral.

In a separate study, John W. Finley, PhD, of the U.S. Department of Agriculture, Grand Forks, N.D., and his colleagues fed three groups of laboratory rats diets containing low-selenium broccoli, high-selenium broccoli, and supplemental selenium without broccoli for 22 weeks. The high-selenium broccoli was grown to contain large amounts of the mineral.

Rats eating the high-selenium broccoli had a lower incidence of breast cancers and fewer tumors in general, compared with rats eating either the low-selenium broccoli or the selenium supplements.

References: Brooks JD, Metter EJ, Chan DW, et al. Plasma selenium level before diagnosis and the risk of prostate cancer development. *Journal of Urology*, 2001;166:2034-2038. Finley JW, Ip C, Lisk DJ, et al. Cancer-protective properties of high-selenium broccoli. *Journal of Agricultural and Food Chemistry*, 2001;49:2679-2683. □

## Researchers Report that Saw Palmetto Reduces Urinary Symptoms

Saw palmetto (*Serenoa repens*) is the most popular herbal remedy for the treatment of urinary symptoms caused by an enlarged prostate, known medically as benign prostatic hyperplasia. The herb has been found beneficial in several double-blind studies, and it causes far fewer side effects than the prescription drug finasteride.

Benign prostatic hyperplasia tends to develop in men after age 50. The symptoms typically include a sudden need to urinate, but weak and incomplete urinary flow, a sense of incomplete voiding, and often "dribbling."

A recent study directed by Glenn S. Gerber, MD, of the University of Chicago, began with 79 men, most in their 60s, receiving placebos for one month. Then, 39 of the men received 160 mg of saw palmetto berry extract twice daily, and 40 continued to receive placebos. Both treatments continued for six months.

Men taking saw palmetto had an average 38 percent decrease in prostate-related urinary symptoms and a slight improvement in their overall quality-of-life scores, based on standard urological tests. In contrast, men taking the placebos had only a 14 percent improvement in urinary symptoms and no improvement in quality-of-life scores.

"Saw palmetto led to a statistically significant improvement in urinary symptoms in men with lower urinary tract symptoms compared with placebo," wrote Gerber and his colleagues.

Reference: Gerber GS, Kuznetsov D, Johnson BC, et al. Randomized, double-blind, placebo-controlled trial of saw palmetto in men with lower urinary tract symptoms. *Urology*, 2001;58:960-965. □

## Vitamin C May Maintain Integrity of Eye Cells, Preventing Retinal Detachment

Proliferative vitreoretinopathy (PVR) is an eye disorder in which normal healing processes go awry. The early stages of the disease are characterized by the proliferation and contraction of eye membranes consisting of retinal pigment epithelial cells, and the final stage can lead to retinal detachment. However, a recent experiment suggests that vitamin C might prevent or reduce the seriousness of PVR.

Norbert F. Schrage, PhD, and his colleagues at

the Technical University of Aachen, German, cultured retinal pigment epithelial cells from the eyes of pigs with and without vitamin C. They found that low dosages of vitamin C increased the proliferation of the cells, but higher dosages inhibited their proliferation, movement, and contraction.

Schrage wrote that vitamin C "should be examined more closely as a potential supplement to other antiproliferative agents in the clinical management of PVR. As a natural compound of the vitreous body [part of the eye], ascorbic acid probably serves as an intrinsic modulator of cell behavior." He added that vitamin C might help maintain normal retinal pigment epithelial cells in healthy eyes.

Bohmer HA, Sellhaus B, Schrage NF. Effects of ascorbic acid on retinal pigment epithelial cells. *Current Eye Research*, 2001;23:206-214. □

## Vitamin E Supplements Protect Both LDL and HDL Cholesterol from Damage

Researchers believe that the oxidation (free-radical damage) of low-density lipoprotein (LDL) cholesterol is an early step in the development of coronary artery disease. In essence, oxidation turns LDL from good – it is the carrier of fat-soluble nutrients in the blood – to bad. In line with this thinking, vitamin E is well established for reducing LDL oxidation.

Less research has focused on the effect of oxidation on the "good" high-density lipoprotein (HDL) form of cholesterol. HDL helps transport cholesterol out of the body, and large amounts of this lipoprotein are believed to protect the heart. But HDL also seems susceptible to oxidative damage.

To assess the role of vitamin E in preventing HDL oxidation, Richard B. Weinberg, MD, and his colleagues at the Wake Forest University School of Medicine, Winston-Salem, N.C., initially placed 10 men and women on a three-week diet high in olive oil, a monounsaturated fat that resists oxidation. Next, the subjects were fed a diet high in polyunsaturated fat (safflower oil) for three weeks. During the final three-week phase of the study, Weinberg and his colleagues gave the subjects 800 IU of vitamin E daily along with the diet high in polyunsaturated fat.

After three weeks of consuming the diet high in polyunsaturated fats, the subjects' LDL oxidized much more quickly than it previously had, an undesirable change. At the same time, the subjects' HDL-2 (considered the most protective form of HDL) became less susceptible to oxidation, a positive change.

After the subjects took vitamin E for three weeks, their LDL oxidation rate returned to normal. In addition, their HDL-2 oxidation declined by 10-

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## Quick Reviews of Recent Research

### • Vitamin E may protect kidneys

Kidney failure generates large numbers of hazardous free radicals that may lead to additional health problems. In an experiment with laboratory rats, researchers mimicked kidney failure by surgically removing part of the animals' kidneys. Some of the rats were fed a standard diet with modest amounts of vitamin E, and another group was supplemented with 125 times more vitamin E daily for six weeks. A control group did not receive any vitamin E. The rats developed hypertension after part of their kidneys were removed, but those receiving the larger amounts of vitamin E had less of a rise in blood pressure.

Vaziri ND, et al. *Hypertension*, 2002;39:135-141.

### • Carotenoids may reduce risk of ovarian cancer

Epithelial carcinoma accounts for more than 90 percent of all ovarian cancer cases in the United States. Researchers pooled the results of five studies (including 3,700 women) focusing on beta-carotene and the risk of ovarian cancer. Women who consumed the largest amounts of beta-carotene – possibly a marker of carotenoids in general or overall fruit and vegetable consumption – were 16 percent less likely to develop ovarian cancer, compared with women who consumed little beta-carotene.

Huncharek M, et al. *In Vivo*, 2001;15:339-334.

### • Pycnogenol® reduces symptoms of asthma

Chromolyn sodium, a common allergy medication, is a synthetic flavonoid. To test the effect of a natural complex of flavonoids, researchers asked 19 men and women with asthma to take either Pycnogenol supplements (1 mg per pound of weight up to 200 mg daily) or placebos for four weeks. The Pycnogenol and placebos were then switched for another four weeks, so all subjects took both during the study. Subjects taking the Pycnogenol had improvements in lung function and reduced levels of inflammation-causing substances.

Hosseini S, et al., *Journal of Medicinal Food*, 2001;4:201-209.

### Vitamin E and Cholesterol...

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fold. Both of the changes that occurred with vitamin E supplementation were positive and protective.

Reference: Schnell JW, Anderson RA, Stegner JE, et al. Effects of a high polyunsaturated fat diet and vitamin E supplementation on high-density lipoprotein oxidation in humans. *Atherosclerosis*, 2001;159:459-466. □

### • Diet and vitamin D may reduce risk of breast cancer

An analysis of deaths from breast cancer in 35 nations found diets high in meat were associated with an increased risk of breast cancer, whereas diets rich in fish and vegetables appeared protective. In addition, the prevalence of breast cancer increased with latitude, very likely the result of diminishing exposure to sunlight and reduced production of vitamin D.

Grant WB. *Cancer*, 2002;94:272-281.

### • Low folic acid linked to cervical dysplasia

Researchers analyzed common genetic defects limiting the activity of folic acid and the risk of precancerous cervical dysplasia in Hawaiian medical clinics. Women with these genetic defects were two to three times more likely to develop cervical dysplasia. Overall, women with the highest risk of cervical dysplasia had low levels of folic acid and vitamins B6 and B12. Women who had been infected with the human papillomavirus also had an increased risk of developing cervical dysplasia. A combination of human papillomavirus infection and a genetic defect influencing folic acid metabolism were 46 times more likely to develop cervical dysplasia.

Goodman MT et al. *Cancer Epidemiology, Biomarkers & Prevention*, 2001;10:1275-1280.

### • Ginkgo may enhance antipsychotic drug benefits

Researchers treated 109 schizophrenic patients with either the antipsychotic drug haloperidol or a combination of haloperidol and *Ginkgo biloba* extract (360 mg daily) for 12 weeks. Both treatments resulted in behavioral improvements based on the scoring of a standard clinical test. However, patients taking ginkgo showed additional behavioral improvements on two other tests, which the haloperidol-only group did not. The antioxidant properties of ginkgo extracts may enhance the effectiveness of antipsychotic drugs.

Zhang XY, et al. *Journal of Clinical Psychiatry*, 2001;62:878-883.

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Post Office Box 30246 • Tucson AZ 85751-0246 USA

Editor and Publisher: **Jack Challem**  
Copy Editor: **Mary E. Larsen**

Medical and Scientific Advisors:

**Richard P. Huemer, MD** Lancaster, California

**Ralph K. Campbell, MD** Polson, Montana • **Peter Langsjoen, MD** Tyler, Texas  
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