

# The Nutrition Reporter™

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## New Research Supports the Use of Vitamin Supplements in Maintaining Brain Function

The long-term use of supplements containing vitamins E and C and folic acid may help people maintain normal brain function as they age, according to the findings of two recent studies.

In the first study, Kamal H. Masaki, MD, of the Honolulu Heart Program, studied a group of 3,385 elderly Japanese-American men living in Hawaii. In a 1988 questionnaire, some of the men reported taking regular supplements of vitamins E and C, though the dosages were not known. In 1993, study participants were assessed for dementia and cognitive function, including memory.

"Vitamin E and C supplements may protect against...dementia and may improve cognitive function in late life," wrote Masaki and his colleagues.

He and his colleagues found that men taking vitamin E and C supplements were 88 percent less likely to develop vascular dementia four years later. Vascular dementia is caused by cardiovascular disease in the brain.

Men taking the vitamins were also 69 percent less likely to develop other types of dementia, except for Alzheimer's disease. The supplements did not appear to affect the risk of Alzheimer's.

"In a separate analysis limited to nondemented subjects, use of either vitamin E or C supplements alone in 1988 was associated significantly with better cognitive test performance in 1991 to 1993...suggesting that long-term use is required to improve cognitive function in late life," wrote Masaki.

Men taking vitamins E and C for at least four years were 20 percent more likely to have better mental function, and those taking the supplements for at least 10 years were 75 percent more likely to have better mental performance.

In what is known as the "Nun Study," David A. Snowdon, PhD, of the University of Kentucky, Lexington, investigated the relationship between blood levels of folic acid and atrophy of the neocortex in 30 elderly nuns who had died. Atrophy of the

neocortex is strongly associated with the severity of Alzheimer's disease.

The nuns had lived in one convent, ate food prepared in the same kitchen, and shared a similar lifestyle. Seven of the nuns took multivitamins, and their blood folic acid levels averaged about three times higher than those who did not take vitamins.

After each of the nuns died, they were autopsied and their brains examined. Low blood levels of folic acid were strongly associated with subsequent atrophy of the neocortex. The relationship between low folic acid and atrophied neocortex was particularly strong among 15 of the nuns who had developed Alzheimer's disease.

References: Masaki KH, Losonczy KG, Izmirlian G, et al. Association of vitamin E and C supplement use with cognitive function and dementia in elderly men. *Neurology*, 2000;54:1265-1272. Snowdon DA, Tully CL, Smith CD, et al. Serum folate and the severity of atrophy of the neocortex in Alzheimer disease: findings from the Nun study. *American Journal of Clinical Nutrition*, 2000;71:993-998. □

### G. Edward Desaulniers, MD

September 5, 1949 - May 16, 2000

Ed Desaulniers was a friend, colleague, and advisor, and we mourn his untimely passing.

A nutritionally oriented physician, Ed learned about the clinical use of vitamins from one of the pioneers: the late Evan V. Shute, M.D., of London, Ontario. It was Shute who discovered, in the 1940s, that vitamin E could prevent and reverse heart disease and who paved the way for the therapeutic use of vitamin supplements.

Ed received his medical degree from the University of Western Ontario and began working at the Shute Institute in 1976. He was named medical director after Evan Shute's death in 1978 and continued the historic legacy of the Shute Institute. Ed's gentle way touched the lives of those around him and will be missed by family, friends, and patients. □

## High-Fiber Diet Can Help Diabetics Reduce Blood Sugar and Disease Risk

A diet containing twice the fiber recommended by the American Diabetes Association can have a significant effect on glucose, cholesterol, and triglyceride levels in Type II diabetics.

Manisha Chandalia, MD, of the University of Texas Southwestern Medical Center, Dallas, and her colleagues asked 13 men and women to consume a diet containing moderate amounts of fiber – 8 grams of soluble and 16 grams of insoluble fiber daily – for six weeks. This is the amount of fiber recommended by the ADA.

The subjects were then asked to eat diets high in fiber – 25 grams of soluble and 25 grams of insoluble fiber daily – for another six weeks.

“Most important,” Chandalia wrote, “we found that the high-fiber diet improved glycemic control, as evidenced by decreases in the mean daily preprandial (fasting) and 24-hour plasma glucose concentrations.”

During the sixth week of the high-fiber diet, the subjects’ average fasting glucose levels were 13 mg/dl lower, and glucose in urine was 1.3 grams lower, compared with their readings during the sixth week of the moderate-fiber diet.

The high-fiber diet also reduced 24-hour glucose and insulin levels “under the curve” by 10 percent – in effect, lowering both glucose and insulin levels by roughly 10 percent.

In addition, the high-fiber diet lowered total cholesterol levels by 6.7 percent, triglycerides by 10.2 percent, and low-density lipoprotein (LDL) levels by 12.5 percent.

The researchers credited the larger amount of soluble fiber for the benefits. Soluble fiber (consisting of pectins, gums, and mucilages) is found in cantaloupe, grapefruit, orange, papaya, lima beans, sweet potato, squash, and oatmeal.

According to a study cited by Chandalia, the typical American consumes only 17 grams of fiber daily.

Reference: Chandalia M, Garg A, Lutjohann D, et al. Beneficial effects of high dietary fiber intake in patients with type 2 diabetes mellitus. *New England Journal of Medicine*, 2000;342:1392-1398. □

## Massive Amounts of Intravenous Vitamin C Helps Burn Victims Recover

Large dosages of intravenous vitamin C speed the recovery of seriously burned patients, according to a study by Japanese researchers.

Hideharu Tanaka, MD, and his colleagues at Kyorin University Hospital, Tokyo, tracked 37

patients hospitalized for burns covering more than 30 percent of their bodies. All of the patients were hospitalized within two hours of their injuries.

Nineteen of the patients were given 66 mg of IV vitamin C per kilogram of body weight each hour during the first 24 hours of hospitalization. For a 150-pound person, this amount would convert to about 4,500 mg hourly, or 108 grams of vitamin C over the 24-hour period.

“In our study, adjuvant administration of high-dose ascorbic acid produced a significant reduction in post-burn lipid peroxidation and resuscitation fluid volume requirements in patients with severe burns,” wrote Tanaka and his colleagues. “This fluid reduction was associated with fewer days receiving mechanical ventilations and improved early respiratory function.”

Patients receiving vitamin C needed 45.5 percent less resuscitation fluid, compared with the control group, indicating a more rapid and stronger recovery. They also had 60 percent less water retention during the first 24 hours, compared with the control group. And over seven days, patients who had received vitamin C gained only one-third the weight of the control group, another positive sign.

In addition, the vitamin C group also needed mechanical ventilation support for an average of 12 days, compared with 21 days for patients not receiving vitamin C.

Free radicals are a major factor in burn injuries, and patients receiving vitamin C had lower levels of malondialdehyde, a marker of free radical activity.

Reference: Tanaka H, Matsuda T, Miyagantani Y, et al. Reduction of resuscitated fluid volumes in severely burned patients using ascorbic acid administration. *Archives of Surgery*, 2000;135:326-331. □

## Switching to Olive Oil Leads to Significantly Lower Blood Pressure

Eating a diet high in olive oil can lead to impressive reductions in blood pressure in people with mildly to moderately elevated blood pressure – and may, for some people, even eliminate the need for antihypertensive drugs.

L. Aldo Ferrara, MD, and his colleagues at the Federico II University of Naples, Italy, asked 23 male and female patients to consume diets high in either extra-virgin olive oil or sunflower oil for six months. At that time, the subjects switched diets, so all subjects consumed both diets during the study. The amount of saturated fat remained the same in both diets.

Olive oil is rich in oleic acid, a monounsaturated fatty acid. Sunflower oil is rich in linoleic acid, an omega-6 polyunsaturated fatty acid (PUFA).

After six months, the average systolic blood pressure of 134 mmHg declined significantly to 127 mmHg among subjects consuming the olive-oil diet. In contrast, people eating the high PUFA diet had a slight, nonsignificant increase of 1 mmHg to 135 mmHg.

Similarly, after six months, the average diastolic blood pressure of 90 declined to 84 mmHg among subjects consuming the olive-oil diet. People eating the high PUFA diet had no change in their diastolic blood pressure.

Especially noteworthy, eight of the 23 patients did not need prescription medicines to control their blood pressure while they were eating the high olive-oil diet.

Although the difference in the chemical structure of the oils may have accounted for the difference in blood pressure, there may have been another reason. Ferrara noted that extra-virgin olive oil contains substantial amounts of antioxidant polyphenols (e.g., flavonoids), adding up to about 15 mg daily. This is a quantity of polyphenols that other studies have found to reduce the risk of coronary artery disease.

Reference: Ferrara LA, Raimondi AS, d'Espiscop L, et al. Olive oil and reduced need for antihypertensive medications. *Archives of Internal Medicine*, 2000;160:837-842. □

## Researchers Find that Vitamin E Slows Development of Cataracts

Supplements of vitamin E can greatly reduce the extent of lens opacity in patients with cortical cataracts, but not with nuclear cataracts, researchers have found.

Simmi Kharb, PhD, of the Postgraduate Institute of Medical Sciences, Rohtak, India, studied 50 patients with cataracts. Twenty-five of the patients had cortical cataracts, and 25 had nuclear cataracts. All were scheduled for cataract surgery.

Cortical cataracts refer to an opacity toward the outside of a lens, whereas nuclear cataracts describe an opacity in the center of the lens.

Kharb asked 12 patients with each type of cataract to take 100 mg of vitamin E twice daily or a placebo for a month. Among patients taking the supplements, vitamin E levels in cortical lens tissue increased by 25 percent and by 21 percent in nuclear lens tissue, compared with patients taking placebos.

In addition, levels of malondialdehyde, an indicator of free radical activity, decreased by 38 percent in cortical lens tissue and by 28 percent in nuclear lens tissue.

Levels of glutathione, an antioxidant produced by cells, increased substantially – by almost 52

percent – in cortical lens tissue, compared with only a 16 percent increase in nuclear lens tissue. This increase in glutathione suggested that vitamin E either spared, or helped cells recycle, glutathione.

Perhaps most significantly, cortical lens opacity decreased by almost 40 percent among patients taking vitamin E, but decreased by only 14 percent in patients with nuclear cataracts.

“The change in the size of lens opacity in cortical cataractous patients receiving vitamin E therapy was significantly decreased as compared to the placebo group...the cortex of the lens might be protected more than the nucleus,” Kharb noted.

Reference: Seth RK, Kharb S. Protective function of alpha-tocopherol against the process of cataractogenesis in humans. *Annals of Nutrition and Metabolism*, 1999;43:286-289. □

## Study Finds that Macadamia Nuts – Containing Good Fat – Are Healthy

Tasty as they are, macadamia nuts have gotten a bad reputation because of their high – 75 percent, by weight – fat content. However, 80 percent of their fat consists of “good” monounsaturated fats, similar to the type found in olive oil.

To assess the effects of a diet containing large amounts of macadamia nuts, J. David Curb, MD, of the University of Hawaii at Manoa, asked 30 healthy men and women to eat three different diets for one month each. The first diet was a “typical American” diet with 37 percent fat, mostly saturated; the second was the American Heart Association Step 1 diet with 30 percent fat; and the third was a macadamia nut-based monounsaturated fat diet with 37 percent fat.

After subjects followed the typical American diet, the average total cholesterol level was 201 mg/dl, the “bad” low-density lipoprotein (LDL) cholesterol was 130, and the “good” high-density lipoprotein (HDL) cholesterol was 55.

Both the Step 1 and the macadamia-based diets reduced total, LDL, and HDL cholesterol levels almost identically – by about 4 percent. The Step 1 diet reduced total cholesterol to 193, LDL to 124, and HDL to 53. The macadamia diet lowered total cholesterol to 191, LDL to 125, and HDL to 53.

The HDL-to-total cholesterol ratio did not change significantly; nor did the HDL-to-LDL ratio.

“The results suggest that replacing saturated fats in the typical American diet with monounsaturated fats present in macadamia nuts has a favorable effect on serum cholesterol concentrations of healthy adults,” Curb wrote.

Although many health professionals continue to argue about the significance of cholesterol as a risk

Continues on next page

## Quick Reviews of Recent Research

### • Seven-study analysis shows kava relieves anxiety

Kava, the popular name for the herb *Piper methysticum*, is a popular over-the-counter remedy for anxiety. In a review of seven clinical trials, researchers found that kava was superior to a placebo in easing symptoms of anxiety. In a meta-analysis of three well-controlled studies, researchers noted that "kava extract is an herbal treatment option for anxiety that is worthy of consideration."

Pittler MN, Ernst E. *Journal of Clinical Psychopharmacology*, 2000;20:84-89.

### • Ginkgo reduces brain damage from stroke

In a study with laboratory mice, researchers reported that supplements of the herb *Ginkgo biloba* reduced brain damage from stroke by 30 percent. The researchers theorized that ginkgo worked by neutralizing free radicals that were created during the stroke.

Clark W. 52nd annual meeting of the American Academy of Neurology, May 2, 2000, San Diego, Calif.

### • Carotenoids protect against free radicals

In a laboratory experiment, researchers found that peroxynitrite, a type of free radical, depleted carotenoid levels in the low-density lipoprotein (LDL) form of cholesterol. Lycopene was the most effective scavenger of peroxynitrite, followed by alpha-carotene, beta-carotene, cryptoxanthin, zeaxanthin, and lutein.

Panasenko OM, et al. *Archives of Biochemistry and Biophysics*, 2000;373:302-305.

### • Vitamins counteract tamoxifen side effects

Tamoxifen, a drug used to treat breast cancer, raises levels of triglyceride, a blood fat that increases the risk of heart disease. To counteract this effect, researchers asked a group of postmenopausal breast cancer patients to take 500 mg of vitamin C and 400 mg of vitamin E, in addition to tamoxifen, for 90 days. Women receiving vitamins C and E with tamoxifen had substantial reductions in total cholesterol, triglycerides, LDL cholesterol and VLDL cholesterol, compared with women treated with tamoxifen alone. Women receiving the vitamins also

### Macadamia Nuts...

Continues from previous page

factor for heart disease, this study found that macadamia nuts had a modestly positive – and clearly not a negative – effect on blood fats.

Reference: Curb JD, Wergowske G, Dibbs JC. Serum lipid effects of a high-monounsaturated fat diet based on macadamia nuts. *Archives of Internal Medicine*, 2000;160:1154-1158. □

had a significant increase in HDL cholesterol.

Babu JR, et al. *Cancer Letters*, 2000;151:1-5.

### • Vitamin E helps diabetics

Researchers used diet medications to improve glycemic control in 30 diabetic patients. The subjects were then asked to take 400 IU of vitamin E for four weeks. The vitamin reduced the diabetics' levels of free radicals and their "oxidative stress" and also increased levels of the antioxidant glutathione.

Sharma A, et al. *Metabolism*, 2000;49:160-162.

### • Pycnogenol® shown to be antiinflammatory

In a study with white blood cells, researchers induced the release of peroxides, free radicals that promote inflammation. The addition of Pycnogenol®, a natural complex of polyphenolic antioxidants, inhibited peroxide formation and increased the activity of glutathione, an antioxidant with anti-inflammatory properties.

Bayeta E, Lau BHS. *Nutrition Research*, 2000;20:249-259.

### • Vitamin E protects against exercise damage

Free radicals are generated as a byproduct of energy-producing reactions in cells, and strenuous exercise generates especially large numbers of free radicals. Studies have shown that exercise-induced radicals can increase oxidation of low-density lipoprotein cholesterol and can damage DNA. Studies have also found that vitamin E protects against exercise-caused free radical damage. Supplementation of 100-200 mg of vitamin E daily may protect trained and untrained athletes, the authors wrote.

Takanami Y, et al. *Sports Medicine*, 2000;29:73-83.

### • Low fish intake linked to depression

People who ate fish less than once per week were 31 percent more likely to experience mild to severe depression. Fish contains omega-3 fatty acids, which are needed for normal brain function.

Tanskanen A, American Psychiatric Association annual meeting, Chicago, Illinois, May 16, 2000.

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