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Diets High in Vegetables, Carotenoids, Lower Men's Risk of Prostate Cancer

Each year in the United States, an estimated 168,000 men are diagnosed with prostate cancer, and 34,000 die from the disease. But according to three recent studies, diets high in vegetables, particularly foods containing lycopene and beta-carotene, can reduce the risk of developing prostate cancer.

In one study, Graham G. Giles, PhD, of the Cancer Epidemiology Center, Carlton, Australia, and his colleagues, compared the diets of 858 men with prostate cancer and 905 men without the disease.

He found that men with the highest overall intake of vegetables were 30 percent less likely to develop prostate cancer, compared with men who consumed few vegetables. Independently of that finding, men eating the largest amounts of allium-family vegetables, such as garlic and onions, were also 30 percent less likely to develop prostate cancer. Finally, Giles reported that men consuming the most tomato-containing foods had a 20 percent lower risk of developing the disease.

In a separate study, Mahyar Etminan, PhD, and colleagues at the Royal Victoria Hospital, Montreal, Canada, analyzed the results of 10 well-controlled studies on tomatoes, tomato products, or lycopene consumption and the risk of prostate cancer. Men eating the most tomato products were 19 percent less likely to develop prostate cancer.

Finally, Kana Wu, PhD, of the Harvard School of Public Health, Boston, and colleagues analyzed the diets, blood levels of carotenoids, and health of more than 51,000 middle-age and elderly men in the Health Professionals Follow-up Study. During seven to 12 years of follow-up, 450 of the men were diagnosed with prostate cancer. Wu compared their diets and blood levels of carotenoids with 450 disease-free men.

Men age 65 or older, and without a family predisposition toward prostate cancer, were 53 percent less likely to develop the disease if they had high blood levels of lycopene. In contrast, men younger than 65 years of age, again without any family history of prostate cancer, were 64 percent less likely to develop the disease if they had high blood levels of beta-carotene.

Wu noted that these carotenoids "may exhibit more potent protection against sporadic prostate cancer rather than those with a stronger familial or hereditary component."

Reference: Hodge AM, English DR, McCredie MRE, et al. Foods, nutrients and prostate cancer. *Cancer Causes and Control*, 2004;15:11-20. Etminan M, Takkouche B, Caamano, et al. The role of tomato products and lycopene in the prevention of prostate cancer: a meta-analysis of observational studies. *Cancer Epidemiology, Biomarkers & Prevention*, 2004;13:340-345. Wu K, Erdman JW, Schwartz SJ, et al. Plasma and dietary carotenoids, and the risk of prostate cancer: a nested case-control study. *Cancer Epidemiology, Biomarkers & Prevention*, 2004;13:260-269. □

Gluten-Free Diet Reduces Genetic Damage in Children with Celiac Disease

Celiac disease, an inherited intolerance of the protein gluten, has long been considered a disease of the immune system. One of its principal symptoms is intestinal inflammation, which damages the digestive tract and interferes with nutrient absorption. Celiac disease is also associated with a variety of "chromosome aberrations" – genetic damage that may increase the risk of cancer.

The usual prescription for people with celiac disease is to avoid wheat, rye, barley, and other gluten-containing grains. Now, researchers report that a gluten-free diet can reduce genetic damage in people with celiac disease.

Sanja Kolacek, MD, and colleagues from the University of Zagreb School of Medicine, Croatia, measured the number of chromosome aberrations in 17 children with celiac disease and 15 healthy children. As expected, children with celiac disease had a high level of chromosome aberrations in their

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lymphocytes, a type of immune cell, compared with healthy children.

Kolacek asked the children with celiac disease to eat a gluten-free diet for at least two years. Twelve of them adhered to the diet, and they had a "significantly lower frequency of chromosome aberrations than did five patients not following the diet," Kolacek reported.

Furthermore, after two or more years of eating a gluten-free diet, the number of chromosome aberrations in children with celiac disease decreased to the levels found in healthy children.

Kolacek concluded that the genetic damage in celiac disease was likely a consequence of chronic inflammation of the intestine.

Reference: Kolacek S, Jadresin O, Petkovic I, et al. Gluten-free diet has a beneficial effect on chromosome instability in lymphocytes in children with coeliac disease. *Journal of Pediatric Gastroenterology and Nutrition*, 2004;38:188-180.

Lutein and High-Potency Antioxidants Improve Vision in People with AMD

Age-related macular degeneration (AMD) is the leading cause of blindness among elderly Americans. It is characterized by free-radical damage to eye tissues and an abnormally thin macular pigment, located in the center of the retina.

The macular pigment consists primarily of lutein, an antioxidant carotenoid found in kale, broccoli, and other vegetables. Studies have shown that people who eat few of these vegetables have a thin macular pigment and a greater risk of developing AMD.

A new study has found that supplements of lutein combined with high-potency antioxidant vitamins, or supplements of lutein alone, can reverse some of the visual impairments of AMD. The combination of supplements provided more benefits than lutein by itself.

Stuart Richer, OD, an optometrist with the North Chicago Veterans Administration Medical Center, and his colleagues treated 90 patients with AMD with one of three supplements daily: 10 mg of lutein; 10 mg of lutein plus a high-potency vitamin, mineral, and antioxidant supplement; or placebos for 12 months. The antioxidant supplement (sold as OcuPower®) included 500 IU of natural vitamin E, 15,000 IU of natural beta-carotene, 1,500 mg of vitamin C, and other vitamins and minerals.

By the end of the study, patients taking either lutein or the lutein/antioxidant combination benefited from significant improvements in glare and visual acuity. However, patients taking lutein and the antioxidants had "broader" benefits, with improved visual acuity, contrast sensitivity, and recovery from glare. Meanwhile, vision deteriorated in the patients taking placebos.

Reference: Richer S, Stiles W, Statkute L, et al. Double-masked, placebo-controlled, randomized trial of lutein and antioxidant supplementation in the intervention of atrophic age-related macular degeneration: the veterans LAST study (lutein antioxidant supplement trial). *Optometry*, 2004;75:216-230.

Enzyme Treatment Shows Promise in Animal Study of Pancreatic Cancer

The use of pancreatic proteolytic enzymes in the treatment of cancer was first proposed almost a century ago, but it has often been dismissed as an unsubstantiated alternative therapy. A new study with mice, however, suggests that it might have some benefits in the treatment of pancreatic cancer, which typically has a poor prognosis.

Parviz M. Pour, MD, of the Nebraska Medical Center, Omaha, and his colleagues conducted two experiments with pancreatic enzymes, to assess their effect on survival and on tumor size. In the first study, 30 mice were injected with human pancreatic cancer cells, but only half of the animals received pancreatic enzymes in their drinking water. Mice receiving the pancreatic enzymes lived for an average of 43.5 days after injection, compared with 35 days for the untreated mice.

In the second experiment, Pour also found that mice treated with pancreatic enzymes lived considerably longer, an average of 58 days compared with 44 days for the untreated mice. In this study, the size and weight of tumors in treated mice were also significantly smaller compared with those in untreated mice.

The dosage of pancreatic enzymes in the experiments were 400 mg per kilogram of weight, the same dosage some physicians use to treat people.

Reference: Saruc M, Standop S, Standop J, et al. Pancreatic enzyme extract improves survival in murine pancreatic cancer. *Pancreas*, 2004;28:401-412.

Alpha-Lipoic Acid Potentially Helpful in Treating Multiple Sclerosis

Multiple sclerosis (MS) is an auto-immune disease in which the body mounts an inflammatory response against the myelin sheaths surrounding nerve cells. As the myelin breaks down, nerve signals short circuit, leading to poor balance, difficulty walking, and fatigue. The disease affects upwards of one-half million Americans.

Based on a recent animal study, alpha-lipoic acid may be helpful in preventing and treating MS. Alpha-lipoic acid is an antioxidant that has been used

to treat nerve disease in diabetics.

Antonio Uccelli, MD, of the University of Genoa, Italy, and his colleagues conducted two experiments using laboratory mice. In the first, Uccelli added alpha-lipoic acid to the drinking water of mice, then injected them with a chemical to cause "experimental auto-immune encephalomyelitis" (EAE), the mouse equivalent of MS.

Uccelli found that alpha-lipoic acid had two clear benefits: it prevented immune cells from attacking the animals' brain and spinal cord, and it reduced damage to the myelin. Animals that did not receive alpha-lipoic acid developed EAE.

In the second experiment, Uccelli injected mice with the chemical to cause EAE and subsequently injected them with alpha-lipoic acid. The intent of this experiment was to determine whether alpha-lipoic acid might slow the progression of EAE after its onset. As in the first experiment, alpha-lipoic acid prevented immune cells from attacking the brain and spinal cord and reduced damage to the myelin.

According to Uccelli, the research "supports further studies on the use of alpha-lipoic acid as a potential therapy for MS."

Reference: Morini M, Roccatagliata L, Dell'Eva R, et al. α-lipoic acid is effective in prevention and treatment of experimental autoimmune encephalomyelitis. *Journal of Neuroimmunology*, 2004;148: 146-153. ▯

High-Doses of Vitamin C Are Better Absorbed Intravenously than Orally

The use of high-dose vitamin C in treating cancer, recommended by Nobel laureate Linus Pauling, PhD, more than 30 years ago, has remained controversial. Some clinical studies have found vitamin C beneficial whereas others have not.

The reason may relate to whether the vitamin is taken orally or intravenously. According to a new study, blood concentrations of vitamin C increase up to 70 times higher after intravenous administration of the vitamin, compared with oral supplements.

Mark Levine, MD, of the National Institutes of Health, Bethesda, Maryland, and his colleagues assessed vitamin C absorption in 17 healthy men and women, ages 19 to 27 years. They reported in the *Annals of Internal Medicine* that blood concentrations of vitamin C seemed to plateau after taking a 300 mg oral supplement.

In contrast, intravenous administration of vitamin C led to blood concentrations 30 to 70 times higher than those achieved through oral supplementation.

Based on the data, Levine and his colleagues calculated that a single 3-gram oral dose of vitamin C would lead to a peak blood concentration of 206 micromoles per liter of blood. In contrast, higher dosages of intravenous vitamin C can produce concentrations of 15,000 micromoles per liter of blood

According to previous research cited by Levine, vitamin C concentrations of 1,000 micromoles per liter of blood are capable of destroying cancer cells.

"Intravenous vitamin C may have a role in the treatment of cancer as a result of the plasma [blood] concentrates that can be achieved only by this route," wrote Levine and his colleagues.

Reference: Padayatty SJ, Sun H, Wang Y, et al. Vitamin C pharmokinetics: implications for oral and intravenous use. *Annals of Internal Medicine*, 2004;140:533-537. ▯

Coenzyme Q10 Supplements Reduce Frequency of Migraine Headaches

Large dosages of coenzyme Q10, a vitamin-like nutrient, can significantly reduce migraine headaches.

Peter S. Sandor, MD, of University Hospitals, Zurich, Switzerland, and his colleagues asked 42 patients to take either CoQ10 (100 mg three times daily) or placebos for three months. Before participating in the study, the subjects suffered an average of 4.4 migraine headaches monthly.

During the study, almost half of the people taking CoQ10 had a 50 percent reduction in the number of migraine headaches. Only about 14 percent of people taking placebos improved.

In addition, patients taking CoQ10 had fewer days with headaches and fewer days with headache-related nausea.

Sandor explained that a lack of cellular energy might contribute to migraine headaches. CoQ10 plays a key role in the production of energy.

Reference: Sandor PS, Di Clemente L, Coppola G, et al. A randomized controlled trial of coenzyme Q10 in migraine prophylaxis. Presented at the American Academy of Neurology's 56th annual meeting, April 24- May 1, 2004, San Francisco, California. ▯

Researchers Find that Trans Fats Increase Markers of Inflammation

Trans fats, manufactured during the industrial hydrogenation of vegetable oils, are known to increase the risk of coronary artery disease and diabetes. If fact, studies have found that these fats, which account for an average of 4 to 7 percent of overall dietary fat in the United States, are far worse than saturated fats.

Now researchers may have identified how trans fats do their damage: they increase inflammation, a

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Quick Reviews of Recent Research

• Low antioxidant intake increases rectal cancer risk

Researchers analyzed intake of antioxidants in 952 men and women with rectal cancer and 1,205 healthy people. Overall, women who consumed relatively little vitamin E were two times more likely to have rectal cancer. Likewise, women consuming very little lycopene were 70 percent more likely to have rectal cancer. Among women age 60 and older, low intake of beta-carotene was related to twice the risk and low intake of vitamin E was associated with three times the risk of rectal cancer.

Murtaugh MA, et al. *American Journal of Epidemiology*, 2004;159:32-41.

• Ginkgo beneficial in severe leg pain

Peripheral artery obstructive disease (PAOD) is characterized by reduced blood flow in the abdominal aorta, the main blood vessel that channels blood to smaller arteries in the legs. It causes severe pain and discourages patients from walking. In an analysis of nine double-blind studies, researchers found that ginkgo supplements led to increases in the distance patients could walk before developing pain.

Horsch S, et al. *International Journal of Clinical Pharmacology and Therapeutics*, 2004;42:63-72.

• Antioxidant combination attacks liver cells

In a study using liver cancer cells, a combination of epigallocatechin-3-gallate (EGCG), principal antioxidant found in green tea, reduced cell proliferation by 40 percent. Vitamin C reduced cell proliferation by 12 percent. Together, however, EGCG and vitamin C inhibited the growth of liver cancer cells by 73 percent. The researchers wrote that "the combination of EGCG and ascorbic acid [vitamin C] can strongly suppress the metastasis of liver cancer cells."

Wei DZ, et al. *Journal of Chemotherapy*, 2003;15:591-595.

• B vitamins reduce risk of cervical lesions

Researchers compared the dietary habits of 214 women diagnosed with either high-grade or low-grade precancerous cervical lesions. High intake of vitamins B1 and B2 from foods, vitamin B12 from supplements, and folic acid from both foods and supplements were associated with a lower risk of high-grade cervical lesions. Vitamin B2 and folic acid intake were associated with a lower-risk of low-grade cervical lesions. Overall, women with the highest intake of these vitamins had a 50 to 90 percent lower risk of developing precancerous cervical lesions.

Hernandez Y, et al. *Cancer Causes and Control*, 2003;14:859-870.

• Antioxidants reduce risk of asthma

Researchers investigated the risk of asthma in 4,093 children ages six to 17 years. Overall, almost 10 percent had been diagnosed with asthma. Children with the highest intake of vitamin C were 35 percent less likely to develop asthma. High intake of alpha-carotene was associated with a 26 percent lower risk.

Harik-Khan RI, et al. *American Journal of Epidemiology*, 2004;159:351-357.

Trans Fats and Inflammation...

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key underpinning of both heart disease and diabetes.

Dariush Mozaffarian, MD, of the Harvard Medical School and his colleagues analyzed dietary consumption of trans fats and several blood markers of inflammation in 823 women. The subjects were participants in the Nurses' Health Study.

Mozaffarian found that consumption of trans fats was related to increased numbers of cell receptors for tumor necrosis factor 1 and 2, both of which reflect inflammatory activity in the body.

Overall, trans fat consumption was not associated with increased levels of interleukin-6 or C-reactive protein, both promoters of inflammation. However, trans fats were related to higher IL-6 and CRP levels in overweight women.

"Further study is indicated to investigate the potential proinflammatory effects of trans fatty acids [trans fats] and the implications of such effects for risk of coronary artery disease, diabetes, and other conditions," Mozaffarian wrote.

Trans fats are usually hidden in "partially hydrogenated vegetables oils," which are used to make many fried foods, breads, cookies, salad dressings, breakfast bars, microwave foods, and many margarines.

Reference: Mozaffarian D, Pischon T, Hankinson SE, et al. Dietary intake of trans fatty acids and systemic inflammation in women. *American Journal of Clinical Nutrition*, 2004;79:606-612. □

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