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# Vitamin K Supplements Continue to Show Benefits to Bone, Cancer Risk

Three new studies have shown that vitamin K supplements can strengthen bone, reduce the risk of fractures, and lower the odds of cancer recurrence. The findings are consistent with earlier studies on vitamin K supplements.

In the first study, June Iwamoto, MD, of the Keio University School of Medicine, Japan, and his colleagues reviewed data from seven clinical trials that, all together, involved several thousand patients who received vitamin K1 or K2 (MK-4 form) supplements or placebos for two to three years.

Iwamoto's analysis found that postmenopausal women taking either form of vitamin K benefited from improvements in hip bone strength and a lower incidence of fractures. However, Iwamoto concluded that vitamin K's benefits were likely related to mostly unidentified factors that did not directly influence bone density.

Meanwhile, Marieke J.H. van Summeren, MD, PhD, of the University Medical Center, Utrecht, Netherlands, and her colleagues compared the effects of vitamin K2 (MK-7 form) and placebos in 55 prepubescent children. Twenty-eight of the children received 45 mcg of vitamin K2 for eight weeks.

Vitamin K is needed to carboxylate, or activate, osteocalcin, a key protein in bone, and so van Summeren tracked the effect of vitamin K on osteocalcin. She found that the amount of under-carboxylated, or inactive osteocalcin decreased, and the ratio of inactive to active osteocalcin improved in the children taking vitamin K. Placebos had no effect.

In the third study, Hitoshi Yoshiji, PhD, and his colleagues investigated whether vitamin K or an ACE-inhibitor (angiotensin-converting enzyme inhibitor) drug would reduce the risk of liver cancer recurrence in 87 patients over a 48-month period. He also studied whether the vitamin or drug reduced angiogenesis, the growth of blood vessels on which tumors depend. All of the patients had previously undergone conventional treatment for liver cancer.

Yoshiji reported that the ACE-inhibiting drug (perindopril, 4 mg/daily) by itself had no effect on liver cancer recurrence and that vitamin K resulted in a very modest decrease in cancer recurrence.

However, the combination of 45 mg (45,000 mcg) vitamin K2 and the ACE-inhibiting drug led to a significant reduction in liver cancer recurrence during the study, compared patients not receiving additional treatment. Patients taking vitamin K and the ACE-inhibiting drug had approximately one-half the risk of liver cancer. They also had lower blood levels of "vascular endothelial growth factor," a key promoter of tumor growth.

Other studies have found that high-dose vitamin K2 can lower the risk of developing cancer.

References: Iwamoto J, Sato Y, Takeda T, et al. High-dose vitamin K supplementation reduces fracture incidence in postmenopausal women: a review of the literature. *Nutrition Research*, 2009;29:221-228. van Summeren MJ, Braam LA, Lilien MR, et al. The effect of menaquinone-7 (vitamin K2) supplementation on osteocalcin carboxylation in health prepubertal children. *British Journal of Nutrition*, 2009: epub ahead of print. Yoshiji H, Noguchi R, Toyohara M, et al. Combination of vitamin K2 and angiotensin-converting enzyme inhibitor ameliorates cumulative recurrence of hepatocellular carcinoma. *Journal of Hepatology*, 2009;51:315-321. ❑

### Perspectives

## The Downside of Multitasking

Multitasking – doing two or more activities at once – has become part of way of doing things. There's no way to completely avoid multitasking, but I have often argued against excessive multitasking. My reason is simple: it's difficult for a person to do two things at the same time equally well. If you doubt me, just think about all the times that slow drivers were yacking on their cell phones in front of you. Their driving suffered because their phone call dominated their attention. You're no better if you try to multitask.

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Recently, researchers at Stanford University in California compared college students who did a lot of multitasking with those who did very little. The researchers figured that students who did the most multitasking would be better at it. They were wrong. It turned out that the students who did the most multitasking weren't very good at it. The more they multitasked, the worse they were in terms of being easily distracted and filtering out irrelevant information, according to an article in the *Proceedings of the National Academy of Sciences*.

Why the surge in multitasking, including texting while driving, in recent years? I believe there are two reasons. One, many new technologies, such as email, cell phones, and texting have encouraged distracting, impulsive-addictive behavior. Two, poorer eating habits, including excessive amounts of caffeine and junk foods low in B vitamins and omega-3 fats, have altered the biochemistry of millions of brains, leaving many people more susceptible to distractions and uncomfortable simply being alone with their thoughts. The solution? Healthier foods, perhaps some supplements, and learning to be mindful and in the moment. – *JC*

## Probiotic Supplements Reduce Cold Symptoms in Children

Taking a daily supplement containing probiotics – some of the beneficial bacteria that inhabit our digestive tracts – can significantly reduce symptoms of the common cold in children.

Gregory J. Leyer, PhD, of Danisco, in Madison, Wisconsin, and his colleagues gave 326 children, ages three to five years, one of three supplements for six months. The children received *Lactobacillus acidophilus* NCFM, a combination of *L. acidophilus* NCFM and *Bifidobacterium animalis* subspecies *lactis* Bi-07, or placebos twice daily during the study.

The single strain of bacteria reduced the incidence of fever and cough, whereas the two-strain combination reduced fever, cough, and runny nose. Both probiotic supplements also led to a decreased need for antibiotics and absences from day care.

The single strain of bacteria reduced fever by 53 percent, coughing by 41 percent, and runny nose by 28 percent. The two-strain probiotic reduced fever by 73 percent, coughing by 62 percent, and runny nose by 59 percent. In addition, the duration of symptoms decreased significantly in both groups. Antibiotic use decrease by 68 percent among children taking the single strain of probiotics and by 84 percent among those taking both strains.

"As the multiple benefits of probiotics are being realized, an important application is in the area of preventing, rather than treating, disease," the researchers wrote.

Intestinal bacteria work in part by secreting compounds that stimulate the activity of immune cells.

Reference: Leyer GJ, Li S, Mubasher ME, et al. Probiotic effects on cold and influenza-like symptom incidence and duration in children. *Pediatrics*, 2009;124:e172-e179. ❑

## Vitamin D May Help Protect Against Flu Complications

Maintaining high levels of vitamin D this winter may enhance protection against the H1N1 flu, according to an analysis of deaths and complications from the 1918-1919 flu pandemic.

William B. Grant, PhD, of the Sunlight, Nutrition and Health Research Center in San Francisco, and Edward Giovannucci, MD, ScD, of the Harvard University School of Public Health, investigated the number of deaths and incidence of pneumonia associated with the deadly flu 90 years ago.

They found that the fewest deaths and cases of pneumonia occurred in two southern American cities included in the data analysis. Residents of those cities would have had the highest sunlight exposure and vitamin D production during the previous summer. The greatest number of deaths and pneumonia cases occurred in northern cities – those with less sun exposure.

Grant and Giovannucci noted that the fatal complications of flu result in part from a secondary bacterial infection, such as pneumonia.

Vitamin D is needed for the body's production of cathelicidin, an antibacterial peptide that has been shown to fight tuberculosis and septicemia. Vitamin D also protects against endotoxins, which are released by bacteria when they are destroyed.

Reference: Grant WB, Giovannucci E. The possible roles of solar ultraviolet-B radiation and vitamin D in reducing case-fatality rates from the 1918-1919 influenza pandemic in the United States. *Dermato-Endocrinology*, 2009;1:1-5. ❑

## Soluble Fiber Works Better than Insoluble Fiber in Easing IBS

Taking psyllium, a type of soluble fiber, does a far better job of reducing symptoms of irritable bowel syndrome (IBS), compared with insoluble fiber.

Soluble fiber forms a gels when it interacts with water in the digestive tract. In contrast, insoluble fiber functions somewhat like a broom that pushes food through the digestive tract.

In the study, C. J. "René" Bijkerk, MD, and his

colleagues at the University Medical Center, Utrecht, Netherlands, asked 275 patients to take one of three products daily for 12 weeks: 10 grams of psyllium (soluble fiber), 10 grams of bran (insoluble fiber), or placebos.

Psyllium reduced symptoms of IBS significantly during the first two months of the study. Although bran seemed to ease symptoms during the third month, the results were not statistically significant. The results from the bran group were also complicated by a high dropout rate, mainly because bran often aggravated symptoms of IBS.

Reference: Bijkerk CJ, de Wit NJ, Muris JW, et al. Soluble or insoluble fibre in irritable bowel syndrome in primary care? Randomised placebo controlled trial. *BMJ*, 2009;339:b3154. ❑

## Fish Oils Improve Blood Vessels in People at Risk of Diabetes

Type 2 diabetes significantly increases the risk of cardiovascular diseases, and the children of people with diabetes often have signs of cardiovascular disease.

But a recent study has found that taking omega-3 fish oil supplements can reduce some of the symptoms of cardiovascular disease in the adult children of people with type 2 diabetes.

Stefano Rizza, MD, of University Hospital, Rome, and his colleagues asked 50 adult children of people with type 2 diabetes to take either 2 grams of omega-3 fish oils or placebos daily for 12 weeks. At the beginning and end of the study, Rizza measured the subjects' blood vessel tone, using a technique known as flow-mediated dilation (FMD). FMD measures blood-vessel flexibility and dilation. Poor blood-vessel flexibility and inability to dilate are known as endothelial dysfunction, a risk factor for cardiovascular disease.

The fish oil supplements led to a significant improvement in FMD, indicating better blood-vessel tone, compared with placebos. In addition, the fish oils reduced triglycerides and tumor necrosis factor alpha, a marker of inflammation.

The fish oil supplements also led to slightly increased levels of adiponectin, a hormone that may be involved in weight loss.

The study, wrote Rizza, "may help to explain mechanisms underlying the protective role of omega-3 polyunsaturated fatty acids in the progression of cardiovascular disease related to atherosclerosis."

Reference: Rizza S, Tesauro M, Cardillo C, et al. Fish oil supplementation improves endothelial function in normoglycemic offspring of patients with type 2 diabetes. *Atherosclerosis*, 2009: doi 10.1016/j.atherosclerosis.2009.03.006. ❑

## Omega-3 Fish Oils Turn Off Genes Involved in Inflammation

Taking omega-3 fish oil supplements quickly turn off large numbers of genes involved in promoting inflammation and heart disease, according to a study by Dutch researchers.

Lydia Afman, PhD, of Wageningen University, Netherlands, and her colleagues asked 302 healthy elderly men and women to take high-dose fish oil capsules (1.8 grams), low-dose fish oil capsules (0.4 mg), or high-oleic acid sunflower oil (4 grams, as a placebo) daily for 26 weeks.

At the beginning and end of the study, Afman and her colleagues drew blood from the subjects and conducted a gene-array analysis on their blood cells. Gene-array analysis looks at how a person's entire suite of 20,000 genes turn on or off – that is, whether the genes become activated or deactivated.

The high-dose omega-3 fish oils changed the activity of 1,040 genes, and the lower dose led to similar (but fewer changes) in gene behavior. The sunflower oil altered the activity of only 298 genes.

Significantly, the omega-3 fish oils resulted in the decreased activity of genes involved in inflammation and plaque formation in heart disease. In other words, fish oils had an anti-inflammatory and anti-atherogenic effect.

The high-dose fish oils provided the daily equivalent of 10 portions of fatty fish, whereas the lower dose was equal to two portions of fatty fish.

Reference: Bouwens M, van de Rest O, Dellschaft N, et al. Fish-oil supplementation induces antiinflammatory gene expression profiles in human blood mononuclear cells. *American Journal of Clinical Nutrition*, 2009;90:415-424. ❑

## N-Acetylcysteine Can Improve Breathing in People with COPD

Long-time smokers of tobacco have the highest risk for developing chronic obstructive pulmonary disease (COPD). The diagnosis reflects a serious decline in lung function that usually gets worse with time.

But an over-the-counter antioxidant, N-acetylcysteine (NAC) can lead to improvements in lung function in people with COPD.

David Stav, MD, and Meir Raz, MD, of the Assaf Harofeh Medical Center, Israel, asked 24 COPD patients to take either 600 mg of NAC or placebos twice daily for six weeks. At that time, Stav and Raz switched the supplements for another six weeks, so that everyone took NAC and placebos at some point during the study.

Continues on next page

# Quick Reviews of Recent Research

**• Most children don't get enough vitamin D**

Researchers from the Albert Einstein College of Medicine in New York City analyzed vitamin D levels of more than 6,000 children and young adults, drawing on data from a national survey. They found that 61 percent of children had "insufficient," or less than optimal, levels of vitamin D. In addition, 9 percent of children had outright deficiencies. In effect, two of every three children did not have optimal vitamin D levels.

Kumar J. *Pediatrics*, 2009;124:epub ahead of print.

**• Mitochondrial nutrients may boost brain**

Mitochondria are the energy factories of cells, and reductions in mitochondrial function accelerate the aging process. Researchers at the University of California, Irvine, fed supplemental alpha-lipoic acid and acetyl-L-carnitine to old rats. Both nutrients are necessary for normal mitochondrial activity. The supplements partially restored mitochondrial function in the brains of old rats to levels comparable to young rats.

Long J. *Neurochemistry Research*, 2009;34:755-763.

**• Chinese herb helps in rheumatoid arthritis**

A Chinese herb, known as Triperygium wilfordii Hook F, lei gong teng, and thunder god vine, works better than the drug sulfasalazine (Azulfidine) in reducing symptoms of rheumatoid arthritis. Researchers at the U.S. National Institutes of Health in Bethesda, Maryland, gave either the herb or drug to 121 patients for 24 weeks. Both groups had a high dropout rate, although substantially more people stopped taking the drug because of side effects. Based on the patients who remained in the study, 65 percent taking the herb had a reduction of arthritic symptoms, compared with only 33 percent of those taking the drug.

Goldbach-Mansky R. *Annals of Internal Medicine*, 2009; 151:229-240.

**• Green tea linked to lower risk of death**

Japanese researchers analyzed the relationship between green tea consumption and the risk of death among 14,000 elderly subjects. Over six years, people who consumed seven or more cups of green tea daily (compared with those who consumed one cup or less) were 76 percent less likely to die of any cause. The subjects were also 75 percent less likely to die from cardiovascular disease and about 31 percent less likely to die from colorectal cancer.

Suzuki E. *Annals of Epidemiology*, 2009;19:732-739.

**• High fructose corn syrup bad for bees, too**

High-fructose corn syrup (HFCS) increases the risk of obesity, diabetes, and coronary artery disease. It may also be a factor in "colony collapse disorder," a disease that has wiped out more than one-third of the U.S. honeybee population. Beekeepers often feed HFCS to honeybees, and researchers discovered that when temperatures increase, HFCS forms hydroxy-methylfurfural (HMF), a toxic compound. Researchers from the US Department of Agriculture noted that HMF could pose a hazard to people as well.

LeBlanc BW. *Journal of Agricultural and Food Chemistry*, 2009;57:7369-7376.

**• Lying down reduces feelings of anger**

According to researchers at Texas A&M University in College Station, Texas, body movements can affect emotions. In a study, researchers found that subjects who were lying down developed less anger, compared with people sitting in a chair, when they were insulted.

Harmon-Jones E. *Psychological Science*, 2009;epub ahead of print.

## N-Acetylcysteine and COPD...

Continues from previous page

The researchers measured several indicators of lung function during rest and after exercise at the beginning and end of the study.

They reported in the journal *Chest* that several indicators of lung function improved when the patients took NAC supplements. The patients had improvements in the amount of air they were able to inhale and exhale, and their exercise endurance also improved.

Stav and Raz attributed the improvements to a reduction in "air trapping" – that is, a better exchange of air in alveoli, the parts of the lung where inhaled and exhaled air are transfered.

Reference: Stav D, Raz M. Effect of N-acetylcysteine on air trapping in COPD. *Chest*, 2009;136;381-383. ❑

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