

# The Nutrition Reporter™

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## Low Vitamin D Increases Risk of Fractures, But Supplements Can Help Prevent Falls

Once shunned because of exaggerated fears of overdose, vitamin D has begun to enter a nutrition renaissance. It is essential for proper calcium utilization, strong bones, and normal muscle strength. Recent studies have found that weak muscles, from a lack of vitamin D, increase the risk of falls and fractures.

People can make vitamin D when their skin is exposed to sunlight, but the sun at northern latitudes is too low to provide any benefit during winter months. Furthermore, heavy clothing and greater time spent indoors further reduces sunlight exposure. As a result, physicians and researchers are increasingly recommending supplemental vitamin D.

In a recent study, Stephen J Gallacher, MD, of Southern General Hospital, Glasgow, Scotland, studied 548 elderly patients who had been hospitalized for hip fracture. Nearly all of the patients – 98 percent – were found deficient in vitamin D. One-fourth of the patients were so deficient that their vitamin D levels were undetectable.

The ability to make vitamin D in the skin decreases with age, as does the ability to absorb it in the gut. "Vitamin D inadequacy is therefore to be expected in the elderly, especially where lifestyle leads to minimal sun exposure, adding further to age-related reduced bone mineralization," Gallacher wrote.

In a separate study, researchers found that supplemental vitamin D could significantly reduce the risk of falls, even when people had normal blood levels of vitamin D.

Leon Flicker, MBBS, PhD, of the University of Western Australia, Perth, tracked the health of 625 elderly subjects, most of whom were women, living in 149 assisted-living and nursing homes. Half of the subjects were given 10,000 IU of vitamin D once a week, which was later adjusted to 1,000 IU daily, for two years. The other half received placebos, and all subjects were given 600 mg of calcium daily.

Overall, subjects were one-fourth less likely to

fall if they had been taking vitamin D supplements. In an analysis of 540 subjects who took at least half of the vitamin D capsules over two years, the risk of falls dropped by more than one-third.

The people in the study were considered a high-risk group for falls because one-third of all hip fractures occur among women in residential care.

After falling, though, subjects had virtually the same odds of suffering a bone fracture regardless of whether they took vitamin D or placebos.

"Older people in residential care can reduce their incidence of falls if they take a vitamin D supplement for two years even if they are not initially classically vitamin D deficient," wrote Flicker.

References: Gallacher SJ, McQuillian C, Harkness M, et al. Prevalence of vitamin D inadequacy in Scottish adults with non-vertebral fragility fractures. *Current Medical Research and Opinions*, 2005;21:1355-1361. Flicker L, MacInnis RJ, Stein MS, et al. Should older people in residential care receive vitamin D to prevent falls? Results of a randomized trial. *Journal of the American Geriatric Society*, 2005;53:1881-1888. □

### Perspectives...

#### Vitamin D – More Is Better than Less

Until the past several years, doctors and dietitians were usually scared off by the thought of vitamin D supplementation. Evidence that now looks terribly archaic suggested that supplemental vitamin D could be toxic in amounts modestly above official "recommended" levels.

What has changed? Vitamin D is needed for both strong bones and strong skeletal muscles, which hold up those bones. A huge body of research has found that a minimum of 800 IU of vitamin D daily is required to reduce the risk of falls and fractures among the elderly.

Some recommendations go far higher, and even the ever-cautious researchers at Harvard University

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are now suggesting higher dosages. In an interview, Harvard's Walter C. Willett, MD, DrPH, told me that many people could benefit from supplements containing 2,000 to 5,000 IU of vitamin D daily.

Still other researchers, such as Reinhold Vieth, PhD, of the University of Toronto, recommend upwards of 10,000 IU daily. Simply spending 15 minutes in the summer sun, in walking shorts and a tee shirt, enables your body to make 10,000 IU. Contrast these numbers with the meager Reference Daily Intake (RDI) of 200 to 500 IU.

Food sources of vitamin D are limited, and it's common for people to develop marginal vitamin D levels or outright deficiencies during the winter months when they are exposed to little sunlight.

Get out a map, and if you live north of Phoenix, Arizona – 35° north – you probably don't get enough winter sun exposure even if you spend lots of time outdoors. That means you should most likely supplement with vitamin D. If you spend most of the year indoors, regardless of your latitude, you may never adequately build up your vitamin D levels, meaning that you will probably benefit from year-round supplementation. – JC

### Reanalysis Finds that B Vitamins, Do In Fact, Lower the Risk of a Second Stroke

Last year researchers reported that supplements of B vitamins had only negligible benefits in reducing the risk of stroke or heart attack. Perplexed, they investigated unexpected confounding factors and then reanalyzed their data.

It turns out that the B-vitamin supplements *did* significantly reduce the risk of a second ischemic stroke (the most common type), coronary heart disease, and death, according to the latest report by J. David Spence, MD, of the Stroke Prevention and Atherosclerosis Research Centre in London, Ontario, Canada.

In retrospect, Spence and his colleagues thought that recent food fortification with folic acid might have reduced the relative benefits of the vitamin supplements. They also felt, based on more recent research, that some patients might need higher amounts of vitamin B12.

So in their reanalysis, the researchers excluded patients who initially had low vitamin B12 levels (suggestive of absorption problems) and those with very high levels (suggestive of supplement use beyond that in the study). They focused on patients "most likely to benefit" from supplements.

In their reanalysis of 2,155 men and women, Spence found that modestly high-dose supplements led to a significant 21 percent reduction in a second stroke, heart disease, or death over two years.

Patients with normal to high vitamin B12 levels at the start of the study benefited most from the supplements, whereas those with relatively low B12 levels fared the worst (again suggesting poor absorption).

"In the era of folate (folic acid) fortification, B12 plays a key role in vitamin therapy for total homocysteine. Higher doses of B12 and other treatments to lower total homocysteine may be needed for some patients," wrote Spence.

The supplements consisted of a combination of 2.5 mg folic acid, 25 mg vitamin B6, and 400 mcg vitamin B12 daily. These vitamins lower blood levels of homocysteine, a known risk factor for cardiovascular disease.

Reference: Spence JD, Bang H, Chambless LE, et al. Vitamin intervention for stroke prevention trial. An efficacy analysis. *Stroke*, 2005;36:2404-2409. □

### Magnesium May Be Underrated for Its Importance in Keeping Bones Strong

High intake of magnesium appears just as important as calcium in maintaining strong bones, according to a study by researchers at the University of Tennessee, Memphis.

Kathryn M. Ryder, MD, and her colleagues investigated magnesium intake from diet and supplements and bone-mineral density – that is, bone strength – in more than 2,000 elderly African-American and white men and women.

"Magnesium is a lesser-studied component of bone that may play a role in calcium metabolism and bone strength...magnesium deficiency...may contribute to a loss of bone-mineral density via lower retention of calcium, [and] decreased intestinal absorption of calcium..." Ryder wrote.

She found that in white men and women, but not African-Americans, higher magnesium intake was associated with greater bone-mineral density in the whole body.

Ryder wrote that white women had a high intake of magnesium because of their more frequent use of magnesium-containing supplements. White men had a high intake of magnesium from both foods and supplements, compared with black men.

However, only about one-fourth of all the people studied consumed the "recommended" dietary intake of magnesium.

For every increase of 100 mg of daily magnesium intake, the subjects had a 2 percent increase in whole-body bone-mineral density. The impact of magnesium was comparable to the effect of calcium on bone-mineral density, Ryder noted.

Magnesium might serve as a buffering agent for the acid produced by the typical Western diet, she added. A more acidic profile increases the release of

calcium from bone.

“Higher magnesium intake through dietary change or supplementation may provide an additional strategy for the prevention of osteoporosis,” she concluded.

Reference: Ryder KM, Shorr RI, Bush AJ, et al. Magnesium intake from food and supplements is associated with bone mineral density in healthy older white subjects. *Journal of the American Geriatrics Society*, 2005;53:1875-1880. □

## Surgery, Not Surprisingly, Increases Vitamin C Requirements

If you're heading into surgery, you're going to need some extra vitamin C.

Andreas Rumelin, MD, of the University of Bonn, Germany, and his colleagues recently investigated how surgery leads to a rapid decrease in vitamin C blood levels and its increased “clearance” from the body.

“A reduction of plasma ascorbic acid [vitamin C] concentrations in the post-operative period has been well documented and is associated with an increase in post-operative complications,” Rumelin wrote in the *Journal of Surgical Research*.

In the study, he gave vitamin C (about 420 mg for a 150-pound person) to 15 middle-age and elderly patients before and after they underwent neck surgery. Rumelin and his colleagues then measured the patients' vitamin C levels before surgery and on the first day after surgery.

They found that the patients had an average drop of 40 percent in their blood vitamin C levels on the first day after surgery. At the same time, there was an average 37 percent increase in “metabolic clearance” of vitamin C from the body.

He calculated that a dose of approximately 1,150 mg of vitamin C would be needed to offset the loss and to return vitamin C to normal levels. But he also acknowledged, “The optimal post-operative plasma concentration of ascorbic acid is not known.”

Reference: Rumelin A, Humbert T, Luhker O, et al. Metabolic clearance and the antioxidant ascorbic acid in surgical patients. *Journal of Surgical Research*, 2005;129:46-51. □

## Fish Oils Supplements Reduce Heart Damage During Bypass Surgery

Taking omega-3 fish oil supplements before heart bypass surgery can reduce damage to the heart and also improve levels of cholesterol and other blood fats.

Philip R. Belcher, MD, a cardiac surgeon at the Royal Infirmary, University of Glasgow, Scotland, and his colleagues asked 40 patients to take either

8 grams of fish oil capsules or placebos daily for six weeks before heart bypass surgery.

The researchers reported that levels of cardiac “troponin,” a marker of cardiac damage, increased immediately after surgery. Troponin levels remained significantly higher in the placebo group 24 hours after surgery. However, Belcher noted that “this was not observed in the fish oil group, thus possibly indicating a protective effect.”

Patients taking fish oils had significant decreases in very-low-density lipoprotein (VLDL) and triglyceride levels and increases in high-density lipoprotein (HDL) levels. “These effects were the opposite of those observed with the placebo group, where there was a reduction in HDL cholesterol and an increase in plasma triglycerides and VLDL,” Belcher noted.

Although he had hoped to measure a decrease in the inflammatory response among patients taking fish oils, no such change was seen. Still, Belcher wrote that pre-operative fish oils “may moderate post-operative myocardial damage.”

Reference: Charman A, Muriithi EW, Milne E, Wheatley DJ, et al. Fish oil before cardiac surgery: neutrophil activation is unaffected but myocardial damage is moderated. *Prostaglandins, Leukotrienes and Essential Fatty Acids*, 2005;257-265. □

## Supplements of the Herb Feverfew Significantly Reduce Migraines

The herb feverfew (*Tanacetum parthenium*) is a traditional herbal remedy for preventing migraine headaches, and many scientific studies have confirmed its benefits. In the latest study, researchers found that a proprietary standardized extract of feverfew significantly reduced the frequency of migraine headaches.

Hans-Christoph Diener, MD, PhD, a neurologist at the University of Duisburg-Essen, Germany, and his colleagues treated 170 patients with either feverfew supplements or placebos for 16 weeks. The feverfew dosage was 6.25 mg three times daily.

Diener reported that patients taking feverfew had a decrease of five to three monthly migraine headaches. Although patients taking placebos also had a decrease in migraine headaches, feverfew was three and one-half times more effective. Patients taking placebos experienced slightly more side effects.

Reference: Diener HC, Pfaffenrath V, Schnitker J, et al. Efficacy and safety of 6.25 mg t.i.d. feverfew Co2-extract (MIG-99) in migraine prevention – a randomized, double-blind, multicentre, placebo-controlled study. *Cephalalgia*, 2005;25:1031-1041. □

More research summaries on next page

# Quick Reviews of Recent Research

**• Vitamin E boosts lifespan, well being**

In a study using laboratory rats, a team of Spanish and Australian researchers found significant benefits from supplemental vitamin E. The animals had a 40 percent increase in their average lifespan and a 17 percent lengthening of their maximum lifespan. The animals also maintained significant advantages in their problem-solving abilities and neuromuscular activity, compared with mice that did not receive extra vitamin E.

Navarro A, et al. *American Journal of Physiology – Regulatory, Integrative and Comparative Physiology*, 2005;289:R1392-1399.

**• Cruciferous veggies benefit some with lung cancer**

Glutathione-S-transferases are a family of potent antioxidants and detoxifying enzymes made by the body. These enzymes are known to also break down isothiocyanates, anti-cancer compounds found in cruciferous vegetables, such as broccoli and cauliflower. In a study of more than 2,100 people with lung cancer, and approximately the same number of people without cancer, researchers found that consumption of cruciferous vegetables provided little benefit to people with active forms of GSTM1 and GSTT1 genes, which program the production of different types of glutathione-S-transferases. However, people with *inactive* forms of these genes *did* have a lower risk of lung cancer if they ate a lot of cruciferous vegetables.

Brennan P, et al. *Lancet*, 2005;366:1558-1560.

**• St. John's wort works as well as Zoloft**

German researchers treated 200 patients with moderate depression with either 612 mg of St. John's wort or the drug Zoloft for 12 weeks. Scores on a standard clinical test for depression decreased significantly in both groups and continued to decline during an additional 12 weeks of therapy. St. John's wort reduced depression scores by almost three-fourths, whereas Zoloft reduced scores by about two-thirds. Eighty-four percent of patients taking the herb were considered responders to the treatment, slightly more than those taking Zoloft.

Gastpar M, et al. *Psychopharmakotherapie*, 2005;12:146-153.

**• Pomegranate juice may protect prostate**

Pomegranate fruit and juice are rich in antioxidant and anti-inflammatory compounds called polyphenolic flavonoids. In a study with an aggressive type of human prostate cell, researchers found that an antioxidant extract of pomegranate juice inhibited cell growth and led to the destruction of the cancer cells. In a related study, the researchers

implanted hormone-sensitive tumors in laboratory mice, but the pomegranate juice extract led to an inhibition of tumor growth and a reduction in prostate-specific antigen levels.

Malik A, et al. *Proceedings of the National Academy of Sciences*, 2005;102:14813-14818.

**• Antioxidants may protect against mercury**

Thimerosal is a mercury-containing compound that has been used for years as a preservative in infant vaccines and flu vaccines. In recent cell experiments, researchers found that thimerosal toxicity was related to an extreme depletion of the antioxidant glutathione. Pretreatment with N-acetylcysteine and glutathione ethyl ester protected cells against thimerosal. The preservative has been removed from many infant vaccines, but it is still used in flu vaccines.

James SJ, et al. *Neurotoxicology*, 2005;26:1-8.

**• Calcium help bones in women using contraceptives**

Women who use oral contraceptives may not achieve optimal bone density, which may increase their risk of osteoporosis later in life. In a study of 135 young women, increases in dietary calcium intake improve bone-mineral content and bone-mineral density over one year.

Teegarden D, et al. *Journal of Clinical Endocrinology and Metabolism*, 2005;5127-5133.

**• Vitamin C helps maintain healthy arteries**

High blood levels of homocysteine, a consequence of low B vitamin intake, stiffens blood vessels and impairs blood flow through a process known as endothelial dysfunction. Researchers increased homocysteine levels in 11 healthy young men by giving them large amounts of supplemental methionine. The increased homocysteine reduced blood flow, but the effect was largely reversed with 2 grams of vitamin C.

Yamashita K, et al. *International Journal of Cardiology*, 2005;104:163-169.

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Post Office Box 30246 • Tucson AZ 85751-0246 USA

Editor and Publisher: **Jack Challeng**

Copy Editor: **Mary E. Larsen**

Medical and Scientific Advisors:

**Richard P. Huemer, MD** Lancaster, Calif • **Ralph K. Campbell, MD** Polson, Montana  
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