

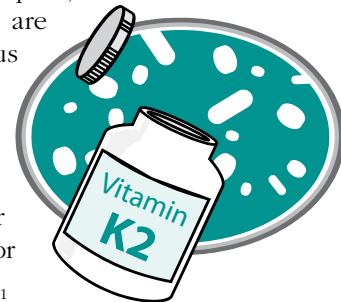
Vitamin K2

a little known vitamin with great effect

by Michael Smith PhD MDsc

Until about a decade ago most researchers had **no idea there were TWO versions** of this fat soluble vitamin. Most people knew that **VITAMIN K1 (phylloquinone) is required for proper blood clotting.** For instance, lack of K1 may result in hemophilia. That there is a **SECOND, related VITAMIN K2** called menaquinone **required for calcium deposition in bone is NEWS.**

Osteoporosis is the underlying cause for breakage of the large supporting bones in humans, especially post-menopausal women and seniors of both sexes. Osteoporosis is a syndrome in which the bone micro-architecture is disrupted, the minerals calcium and magnesium are lost and the amount and variety of non-collagenous proteins in bone are also altered. Accidental falls are nearly always morbid and often become mortal. The onset of osteoporosis is now considered direct clinical indicator of overall health. The measured rate of Bone Mineral Density (BMD) loss, from our senior citizens, has even become a hi-tech predictor of death for both men and women from all causes.¹



For many people osteoporosis is directly related to long-term, insufficient dietary intake of calcium, magnesium, vitamin D3 and K2—in other words nutrient starvation. This dire condition may be due to the decreased appetite of the elderly, decreasing ability to absorb important nutrients with age, lack of sunshine and exercise, substitution of regular meals with non-nutritious snacks (the American favorite), the lack of will power to follow a healthy diet and/or the final phases of chronic alcoholism.² Additionally, certain gastrointestinal disorders—particularly those involving the small intestines such as Celiac Sprue, Crohn's, Candidiasis, etc.—can affect nutrient metabolism, absorption and ultimately utilization.



It appears the requirement for vitamin K2 also increases with age; bloodstream markers of vitamin K2 deficiency increase with age despite similarities in diet and a steady ingestion of dietary K2 independent of age.³ Correlating with these findings, vitamin K2 deficiency is becoming common in the US as the average citizen age. Unfortunately, vitamin K2 is not a common nutrient supplied from fruits and vegetables but is only available in small amounts from meats, fish and eggs. A major source for vitamin K2 in Asia, where women do not suffer osteoporosis at the US rate, is fermented legumes such as soybeans—not a common dietary source in the US at all. Luckily, purified, natural vitamin K2 has recently become available and this has encouraged a number of recent clinical investigations and reports.

Long-term supplementation of post-menopausal Japanese women with vitamin K2, in combination with vitamin D3, resulted in increased vertebral bone mass without any increase in possible adverse effects such as blood coagulation.⁴ This is a wonderful result since the question used to be—does vitamin K2 also affect and even encourage blood coagulation? These results have been confirmed by several studies in Europe which have even shown that BMD is sometimes increased with vitamin K2 supplementation. X-ray scans of the femoral necks of women taking vitamin K2 for three years evidenced that actual bone strength, as well as bone density increased with time, as judged by this important indicator.⁵ Vitamin K2 has also been shown safe for adult women at the level of several mg/day for several years, which is many times the amount thought necessary to save BMD. A very recent study has shown that vitamin K2 is also safe for children, even in

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Vitamin K2

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high amounts.₆

The diets of many US adults are also deficient in vitamin D₃ because the richest source of this nutrient is fortified milk and our intake and exposure to sunlight drops after the teen years. At the same time, wide-spread D₃ deficiency of North Americans has risen because people are scared and many now avoid sunshine and the great outdoors. The majority of Americans, of all ethnic backgrounds, are now seriously deficient in vitamin D₃, especially during winter, and this deficiency increases with age.₇ Most likely this includes you and me. Likewise, calcium intake decreases with advancing age except for those taking supplements, drinking milk and eating plenty of red meats. Calcium and vitamin D₃ supplementation has been shown to increase BMD in the femoral neck and spine and to coincidentally reduce the incidence of nonvertebral fractures.₈ Concerns over the safety of vitamin D₃ supplementation have been raised but are not at all well-founded; only persons ingesting more than 40,000 IU per day have been reported suffering vitamin D₃ toxicity. People enjoying the sun need not worry about vitamin D₃ toxicity because the biosynthesis is tightly controlled and shuts down after a short time under the sun.₉



To place all of these facts together we can write that seniors are more prone to falls and bone breakage than younger adults and many breaks are the result of low Bone Mineral Density (BMD) and not necessarily directly due to age. Reduced BMD is most often caused by insufficient calcium, magnesium, vitamins K₂ and D₃ which is traced to poor diets and poor nutrient absorption. Dietary supplementation with vitamins K₂, D₃ and especially a combination of K₂ and D₃ has been shown to benefit BMD. Vitamin K₂ and vitamin D₃, taken together in a dietary supplementation program may reduce the incidence of bone fractures for all ages, sex and race. Finally, overdoses of vitamins K₂ or D₃ are extremely rare.

Mike Smith PhD, MDSc, has advanced studies in biochemistry, physiology and medicine. Dr. Smith has co-authored more than 30 scientific and medical articles in journals and lectured extensively. He has designed many new diagnostic tests for clinical use. Dr. Smith became interested in nutritional supplements after reading Linus Pauling and while doing research on oxygen and carbon monoxide toxicities.



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