

Bone health and vitamins D and K

By Todd Stumpf

Recent research has shown there is more to good bone health than calcium alone.

Bone, being a living tissue, undergoes constant transformation. At any given moment there are from 1 million to 10 million sites where small segments of old bone are being broken-down or reabsorbed by osteoclast cells, and new bone is being laid down by osteoblast cells.

Good bone health occurs from maintaining the balance between bone destruction and bone formation, and plays an important role in establishing overall good health.

According to Rodger Murphree, DC, a board-certified nutritional specialist in Homewood, Ala., there are 18 nutrients essential for optimal bone health. “Most people are aware of the importance of calcium for bone health,” Murphree says. “But few know of the vital role vitamin D, and even less about the role of vitamin K, in promoting and maintaining optimal bone health.”

Andrew Halpner, PhD, vice president of product development and technical services for Douglas Laboratories, agrees by saying, “It is important for people to realize that calcium is not the end-all, be-all of bone health.”

VITAMIN D

Vitamin D's key function is the absorption of calcium. “You can take all the calcium supplements you want, but you must have adequate amounts of vitamin D for calcium's absorption. Without vitamin D, calcium supplements are useless,” says Murphree.

Vitamin D is a fat-soluble vitamin found in food, and can also be made in your body after exposure to ultraviolet (UV) rays from the sun. Sunshine is a significant source of vitamin D because UV rays from sunlight trigger vitamin D synthesis in the skin.

Vitamin D is commonly found in fortified milk and dairy products, as well as in certain fish, fortified cereals, and egg yolks. Vitamin D is highly recommended for those who do not get enough sunlight, those with dark pigmented skin, older adults, and those with fat malabsorption.

According to Halpner, research has shown that what



was once thought to be a sufficient intake of vitamin D may, in fact, be well below what is required to achieve optimal health. Many people may require 1,000 to 2,000 IUs of vitamin D daily in order to achieve beneficial blood levels of this important nutrient.

VITAMIN K

Vitamin K is needed for proper bone formation and blood clotting. In both cases, vitamin K does this by helping the body transport calcium. For calcium to be effective in keeping bones strong, Murphree explains that a protein called osteocalcin must be “activated” during a process called gamma-carboxylation. Vitamin K facilitates osteocalcin production. Osteocalcin anchors calcium molecules and helps hold calcium in place within bone. Vitamin K converts osteocalcin into its active, bone-building form.

Halpner states, “Vitamin K is actually part of a family of compounds consisting of K1 and K2, with K2 being a newer supplement linked to bone health.” When you eat vitamin K1 in your food, only 5 to 10 percent of ingested K1 is absorbed and reaches your blood, but significantly greater amounts of K2 is absorbed into your bloodstream where it can be distributed for beneficial use in tissues including bones and arteries. Vitamin K2 also lasts for several days in your bloodstream, compared to K1 which mostly disappears in a few hours.

Green leafy vegetables, such as spinach, collards,


broccoli, and kale, are the best dietary sources of vitamin K1, and such soy products as the recently discovered natto — a Japanese food made from fermented soy beans — is the best dietary source of vitamin K2.

The recommended allowance for vitamin K is about 30 micrograms per day.

GETTING WHAT YOU NEED

Maintaining optimal bone health is a life-enhancing strategy. As Murphree points out, the keys to good bone health are the same as most of the ideals for overall health: lifestyle, diet, and exercise. Unfortunately, typical Americans don't give those things much consideration.

Most people can get vitamins D and K the same way they get other bodily needs: By eating healthy. But, with fewer than 10 percent of Americans eating two fruits and vegetables a day, and worse, only 51 percent eat at least one vegetable a day, Murphree says nutritional supplements are a necessity rather than an option when it comes to having healthy bones.

Bone health can be determined by your healthcare provider with noninvasive, painless bone mineral density tests. No matter the findings, the recommendations will almost be the same: Eat right, exercise, and supplement as recommended. 

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