

THE DANCE OF LIFE

Calcium for bones, Magnesium for muscles

by Margy Squires

When you picture a waltz, your mind creates a vision of grace and symmetry between two people. A dance of harmony. A similar event occurs in nature, a blending of equal forces that results in a whole. The bones and muscles, which make the dance and any movement possible, depend on a perfect balance of two critical minerals, calcium and magnesium, along with a host of other supporting players. Shall we dance?

Minerals themselves are necessary for life. The composition of your whole body, from cell fluids to muscles to bones depend on minerals, in balance. All enzymes in the body require minerals. Along with their cofactor vitamins, minerals keep the body operating, growing and repairing. Minerals also help the central nervous system by supplying energy, relaying messages and reducing inflammatory responses.

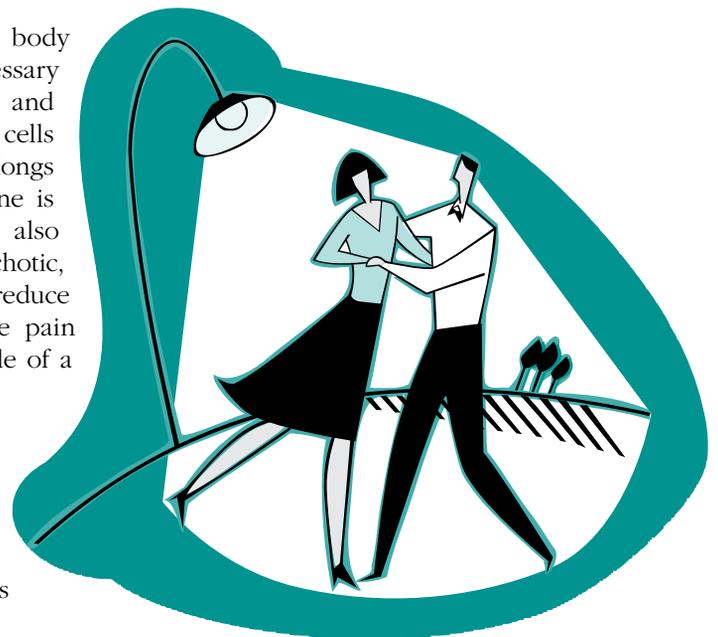
Unfortunately, you're more apt to be deficient in minerals than vitamins. Nearly half of women between the ages of 45-75 showed signs of osteoporosis. A USDA report says 78% of adult women and 56% of men don't get enough calcium. More than 78% of Americans are deficient in magnesium. The latest studies reveal that there is a widespread vitamin D deficiency. Our food supply, when compared to a mere 50 years ago, no longer adequately covers these necessary nutrients through diet. Safe supplementation is the answer. What do you need and why?

The Chelate Factor

Don't reach for any mineral or multi on the shelf. Minerals often compete with each other in gaining access across cell membranes and into the cells where they can be utilized. Albion is the maker of true mineral chelates with a neutral charge, allowing them equal access into the cell to be fully used. The mineral is bound to an amino acid in a special patented bond that crosses the cell barrier easier. Two common non-chelate mineral forms are calcium carbonate (which is basically chalk) and magnesium oxide. Both have low absorption factors. Chelates give you more of the mineral and thus more what the mineral does, as well as the added benefit of what the chelate offers. Two of Albion's preferred chelates are glycine and di-malate.

Glycine is considered a nonessential amino acid, meaning the body can make it. It's the simplest of the amino acids and yet necessary for the synthesis of proteins like creatine for muscle energy and glutathione for immunity. Glycine helps maintain the hydration of cells through proper calcium and magnesium balance, which also prolongs their life. It also mobilizes glucose into the bloodstream. Glycine is also a neurotransmitter for the nervous system. Newer studies also suggest glycine may boost the immune system and has antipsychotic, antispasmodic properties. One study relates that glycine helped reduce sensitivity to touch pressure, which is often evident in muscle pain conditions like fibromyalgia. Magnesium glycinate is one example of a glycine mineral chelate.

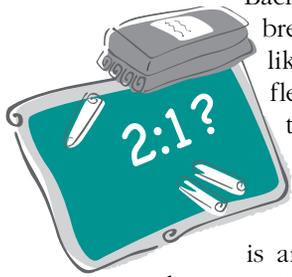
Albion's newest chelate complex is dimethylhydroxymalate or di-malate. Di means two. Simply put, it doubles the amount of carrier chelate which doubles the amount of mineral available to the body. In addition malates do not cause the stomach acid problems carbonates do. More of what malic acid does is described later.



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What About Ratio?



Back to the chalk. If you drop it, it will break. Calcium makes bones brittle like chalk. Magnesium makes them flexible. It's the combination of the two that makes them strong. Muscles also need to contract and relax to move. Calcium contracts a muscle, magnesium relaxes it. The heart is another example of the harmony of the two minerals, in terms of muscle and nerve impulses. If the heart is deficient in either mineral, your body will steal from your bones to maintain function.

Historically, a 2:1 calcium to magnesium ratio was believed to keep these two minerals in balance. Some magnesium experts like Mildred Seelig, M.D. and Guy Abraham, M.D. offer that the ratio should be changed to an equal 1:1 or even reversed 1:2. This is based on numerous studies which show that lower doses of calcium, even at 500 mg a day, maintain the health of bones especially, if enough magnesium is taken. Without sufficient magnesium to transport calcium into the cells, you'll end up with calcium hardening up in places where it does not belong, like in arteries and tissues. Plus, too much calcium actually blocks magnesium, adding insult to injury in any condition that involves muscular health or energy production.

Individually Speaking

While calcium and magnesium are the two biggies in bone and muscle health, don't forget the support of the little guys! Although each mineral does so much more than what's listed here, we think you'll get the picture that harmony among the nutrients is critical. Zinc and copper, which also promote bone building, are needed in such small amounts that a good multiple will supply them.

Calcium You'll find 98% of calcium in the bones and teeth. The other 2% helps muscle contract, nerve activity and blood clotting. Since bones are active tissue, they are constantly building and breaking down. Another balancing act—when bone breakdown occurs more than bone buildup, you risk increased fractures, bone thinning and osteoporosis. A little known fact about calcium is that sufficient HCl acid in the stomach is needed for absorption. Since antacids neutralize stomach acid, they negatively affect calcium levels. Conditions related to low calcium include osteoporosis, hypertension, PMS and heart arrhythmia. Too much calcium is implicated in rheumatoid arthritis, kidney stones, hypomagnesia

and cardiovascular disease. The RDA for calcium varies from 1000-1300 mg a day.

Magnesium. Where most of calcium is in the bones, most of magnesium is in the muscles. All muscle related jobs need magnesium, including the heart. Magnesium helps transport calcium in and out of cells. Magnesium is also responsible for more than 325 enzyme reactions in every cell from producing energy to conducting nerve impulses. Magnesium is often called the anti-stress mineral as it relaxes muscles and nerves. Conditions of low magnesium include cardiac arrhythmia, fibromyalgia, chronic fatigue, spastic colon, diabetes, depression, restless legs, stress, PMS and headaches. Chocolate cravings and sensitivity to loud noises both indicate a need for more magnesium. As mentioned, too much calcium blocks magnesium absorption and many women are on 1300-1600 mg of calcium to prevent bone loss. In one study, women given higher magnesium than calcium increased their bone mass better than on high calcium intake. The RDA for magnesium is only 400 mg.

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Vitamin D. The most important mineral for bones after calcium and magnesium is vitamin D. Although a fat soluble vitamin and stored in the body, new research suggests a widespread deficiency. A University of Minnesota study found that 93% of participants had deficiency,

55% severe and 5 people had no vitamin D at all! Only 10-15 minutes a day of sun is needed to trigger the skin into making vitamin D but 2/3 of the U.S. do not get enough sunshine. The wide use of sunscreens also block vitamin D synthesis. Vitamin D enhances the absorption of calcium through the stomach and small intestines. The NIH suggests 200-600 IU a day. A new study suggests a link between nonspecific musculoskeletal pain and D deficiency (Plotnikoff, 2003). Conditions associated with vitamin D deficiency include hypertension, rheumatoid arthritis, multiple sclerosis, rickets, osteoporosis, colon and prostate cancers.

Manganese. A trace mineral critical to development of cartilage and bone, manganese is important yet often overlooked. A deficiency increases bone loss and a risk of osteoporosis, as well as cartilage and bone malformation. Manganese also plays a role alongside magnesium in producing energy via the Krebs cycle and is needed for the utilization of vitamin B1.

Malic Acid. In fibromyalgia and chronic fatigue, mitochondrial



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energy is compromised. Malic acid in combination with magnesium has been shown to reduce the symptoms of pain, fatigue and poor sleep by increasing energy production in the mitochondria. Malic acid is a weak acid found in fruits such as apples, is considered nontoxic and safe, even in large quantities, and has historically been used for soft tissue rheumatism for years.

Boron. Considered a nonessential, trace mineral, boron is anything but. In fact, boron is believed to backup vitamin D and magnesium if either one is low in order to help calcium in building bones. In one osteoarthritis study, bone nearest the joint had less mineralization, including boron, than those from control or fracture patients. Boron may inhibit cyclooxygenase (COX) and lipoxygenase (LOX), two enzymes that cause inflammation and joint problems (Gaby, 1999). Studies have shown boron may have a role in brain cognition also (Hellwell et al, 1996).

Vitamin K. Another fat soluble vitamin, vitamin K helps your blood clot and also influences osteocalcin, a protein that builds bones. Many experts think that you need a higher intake than RDA suggests. The Institute of Medicine suggests 120 mcg for males, 90 mcg for females. A Tufts study safely used 420 mcg, four times the RDA in one of its bone studies (Booth, 2001). Interestingly, half of the vitamin K needed is manufactured in the friendly bacteria in the gut, another reason you need a healthy gut.



B₁ (Thiamine). B₁ is essential for metabolism of carbohydrates necessary for energy, particularly for the brain and nervous system. It promotes healthy skin and growth. B₁ facilitates transmission of select nerve signals to the brain and spinal cord and is needed for any kind of physical or mental stress. Low levels can cause symptoms of mental confusion, fatigue, poor wound healing and depression.

B₆ (Pyridoxine). A critical B vitamin involved in over 60 enzyme reactions, B₆ helps with energy by assisting assimilation of proteins and fats. With B₁₂ and folic acid, B₆ helps break down homocysteine which studies suggest may play a role in joint inflammation as well as heart disease. B₆ reduces nerve related pain. It also assists in the conversion of tryptophan to serotonin, which helps mood, sleep and pain. Low levels are implicated in carpal tunnel syndrome, neuritis, epilepsy, anemia and depression.

Vitamin C. The role of vitamin C as an antioxidant is well known. With less oxidative damage to cells and tissues, your muscles, bones and joints are healthier. Vitamin C is also the cornerstone of collagen, the basis of connective tissue in muscles and joint linings. Vitamin C synergistically

makes every chemical reaction work more efficiently. A neutral pH form, esterified C as in Fibro-C™ will not upset the stomach.

FOS. Fructooligosaccharides establish an environment in the GI tract for friendly bacteria to thrive and grow. A healthy GI tract increases the production of vitamin K. Nutraflora® offers a patented form of FOS which has been shown in human studies to lower the pH of the colon, thus increasing the absorption factor of calcium and magnesium.

Shall We Dance?

As you can see, it takes a lot of coordination to get you up on the dance floor. It's amazing how the body has the ability to orchestrate its intricate system of bones, muscles and nerves in order to do something as simple as a dance. But no matter what kind of movement you're up to, a strong skeleton and flexible muscles will get you where you want to go.

Resources

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