

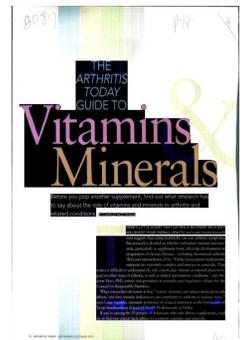
THE
ARTHRITIS
TODAY
GUIDE TO
**Vitamins
Minerals**

Before you pop another supplement, find out what research has to say about the role of vitamins and minerals in arthritis and related conditions. BY CAMILLE NOE PAGÁN

HERE'S LITTLE DOUBT THAT EATING A NUTRIENT-RICH DIET WILL BOOST YOUR OVERALL HEALTH, and some recent research even suggests that eating healthfully can ease arthritis symptoms. But research is divided on whether individual vitamins and minerals, particularly in supplement form, affect the development or progression of chronic diseases – including rheumatoid arthritis (RA) and osteoarthritis (OA). “Unlike prescription medications, nutrients are extremely complex and interact in networks. That makes it difficult to understand the role a particular vitamin or mineral plays in regard to either form of arthritis, as well as related autoimmune conditions,” says Andrew Shao, PhD, senior vice president of scientific and regulatory affairs for the Council for Responsible Nutrition.

What researchers do know is that “certain vitamins can reduce medication side effects, and that vitamin deficiencies can contribute to arthritis in various ways,” says Lona Sandon, assistant professor of clinical nutrition at the University of Texas Southwestern School of Health Professionals in Dallas.

If you're among the 50 percent of Americans who take dietary supplements, read on to find out crucial facts about 11 common vitamins and minerals.



Calcium

WHAT WE KNOW: Calcium is a major component of bones, and numerous studies have shown that adequate intake helps to prevent osteoporosis, which is the loss of bone density. It's especially important for individuals who take corticosteroids, such as prednisone, to get enough calcium with vitamin D, which helps the body absorb calcium, because these medications markedly increase the risk of osteoporosis, says Donald Marcus, MD, professor of medicine and immunology in the Department of Medicine at Baylor College of Medicine in Houston.

RECOMMENDED DOSAGE: 1,000 mg daily; 1,200 mg daily if you're older than age 50. Calcium citrate supplements tend to be better absorbed by the body than calcium carbonate.

PRECAUTIONS: Don't take more than 1,200 mg of calcium (in supplement form) a day unless instructed by a doctor or dietitian. Excess amounts (more than 2,500 mg a day) can harm the kidneys and can reduce the absorption of other minerals like iron, zinc and magnesium. Also, avoid taking calcium supplements at the same time as some kinds of medications, including bisphosphonates like alendronate (*Fosamax*) and ibandronate (*Boniva*) and certain antibiotics, because it can block their absorption by the body.

Best Food Sources:
Dairy products, sardines, tofu and green leafy vegetables.



Folate

WHAT WE KNOW: Folate (which is called folic acid in supplement form) is a B vitamin that offsets side effects of the arthritis drug methotrexate, including nausea, mouth ulcers, blood problems, liver cirrhosis, hair loss and folic acid deficiency, says James McKoy, MD, chief of rheumatology at Kaiser Permanente in Honolulu. "That's why it's almost always prescribed alongside the drug," he says.



Folate also reduces homocysteine, an amino acid that tends to be found at high levels in individuals with RA – which, according to studies, may account for their increased risk of heart disease and related mortality.

RECOMMENDED DOSAGE: The RDA for folic acid is 400 micrograms, or ug, daily, but individuals taking methotrexate typically take 1,000 to 2,000 ug daily.

PRECAUTIONS: A high intake of folic acid can mask vitamin B12 deficiency, which can lead to anemia, a condition marked by low red blood cell levels that can cause exhaustion, cognitive issues and blood-clotting problems, nerve damage and even tremors, especially in the elderly. If you're taking more than 1,000 ug daily, ask your doctor to check your blood levels of vitamin B12.

Best Food Sources: Green leafy vegetables like spinach and kale; fortified cereal and bread.

Iron

WHAT WE KNOW: Autoimmune diseases, including arthritis, can contribute to anemia by affecting levels of hormones required to produce red blood cells, says Sandon. "In addition, nonsteroidal anti-inflammatory medications used to treat OA and RA can cause gastric bleeding, which can also cause anemia," she notes. That's why individuals with arthritis – particularly those who don't eat a lot of red meat – should ask their physician to check their blood iron levels to see if they need iron supplements. One recent study also found that people with fibromyalgia have low blood levels of iron, although the connection isn't clear.

RECOMMENDED DOSAGE: 8 mg daily for men of all ages and women older than age 50; 18 mg for women younger than the age of 50. If you have anemia, your doctor may recommend more. Ferrous iron supplements are more easily

absorbed than ferric iron supplements.

PRECAUTIONS: Iron supplements can cause constipation. Too much iron can be toxic, and may increase the risk of heart disease, so never take more than the RDA unless instructed by a physician.

Best Food Sources: Almost all forms of meat; dark leafy greens, beans, tofu and raisins. Grain and plant sources of iron (called "nonheme" iron), are better absorbed by the body when combined with a little vitamin C. So consider adding tomatoes or citrus juice to a meal with nonheme iron.

Magnesium

WHAT WE KNOW: Magnesium is involved in more than 300 metabolic reactions, including the growth and maintenance of joint cartilage. For that reason, one 2005 study in the *Critical Reviews of Food Science and Nutrition*, suggests that supplementation of nutrients including magnesium may be helpful for people with OA. Low levels of magnesium cause muscle tension and spasms, which explains why magnesium has been shown to be helpful in easing muscle aches in individuals with fibromyalgia. "With fibromyalgia, muscles are stuck in the shortened position. Magnesium allows them to relax," explains Jacob Teitelbaum, MD, medical director of the Fibromyalgia and Fatigue Centers of America, in Annapolis, Md.

RECOMMENDED DOSAGE: 420 mg daily for men; 320 mg daily for women. It's best absorbed by the body when taken alone, rather than in the form of a calcium/magnesium supplement.

Best Food Sources:

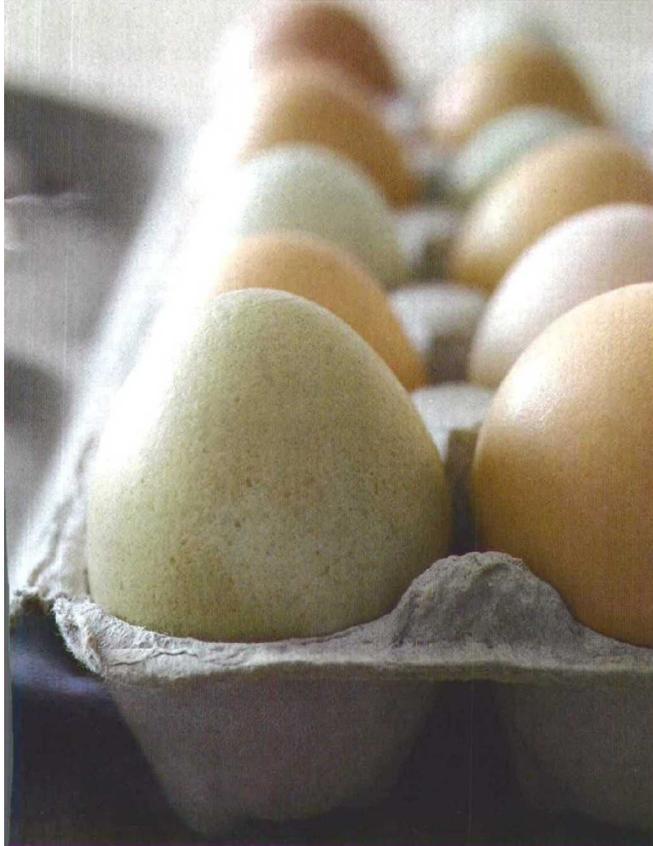
Some kinds of fish, like halibut and tuna; oats; barley and buckwheat; nuts, beans, potatoes and milk.

PRECAUTIONS: Magnesium, particularly in higher doses, may cause diarrhea, and it may interact with certain antibiotics and diuretics. Talk to your doctor before taking supplements if you're using magnesium-containing antacids or laxatives.



Vitamin B3

WHAT WE KNOW: A few studies suggest that a type of vitamin B3 called niacinamide, which is related to niacin but has different actions in the body, may improve OA symptoms. One of the most recent, a 1996 study from the National Institutes of Health, found that niacinamide supplementation decreased the severity of OA symptoms by 29 percent and reduced the need for nonsteroidal anti-inflammatory drugs (NSAIDs) by 13 percent. The mechanism isn't fully understood, but one 1999 study in *Medical Hypothesis* suggests that niacinamide may inhibit interleukin-1, a protein that triggers inflammation.



men older than 50. It's best consumed through food or multivitamin, and not needed as a separate supplement.

PRECAUTIONS: Getting more than 100 mg per day from supplements can damage nerves in the arms and legs. The nerve damage goes away when supplements are stopped.

Best Food Sources: Fortified cereal, potatoes, bananas, garbanzo beans and chicken breasts.

Vitamin C

WHAT WE KNOW: Because it's a powerful antioxidant, researchers have long wondered if vitamin C can counter some of the inflammation-causing free radicals associated with arthritis – but so far, studies have not shown supplementation to benefit OA or RA. However, “several studies have shown that C lowers levels of urate acid in individuals with gout, easing symptoms and even preventing gout flares” says Sandon.

RECOMMENDED DOSAGE: The RDA is 95 mg daily for men; 75 mg for women. Research indicates that about 500 mg a day can reduce levels of uric acid in individuals with gout.

PRECAUTIONS: High levels of vitamin C (around 1,000 mg daily, although some people may be sensitive to lower levels) can cause diarrhea. If you have gout, talk to your doctor before taking vitamin C, as rapid changes in uric acid levels can trigger a gout attack.

Best Food Sources: Orange juice, citrus fruit, broccoli, strawberries, kiwifruit and bell peppers.

Vitamin D

WHAT WE KNOW: In addition to its well-known role in maintaining bone health, a growing body of research shows that vitamin D – which the body makes when exposed to sunlight – has a role in the regulation of cells responsible for immunity and autoimmune function. Studies also have shown that adequate amounts are linked to increased heart health and better

RECOMMENDED DOSAGE: 1 g of niacinamide three times a day

PRECAUTIONS: If you're looking to ease OA, be sure to look for niacinamide, rather than niacin, which is a slightly different form of the vitamin that doesn't appear to have the same benefits. In rare instances, niacinamide can cause nausea; if you experience this, cut the dosage in half. Do not take it if you're pregnant.

Best Food Sources: Yeast, meat, fish, milk, eggs, green vegetables and fortified cereal grains.

Vitamin B6

WHAT WE KNOW: People with RA tend to have low blood levels of vitamin B6, says Sandon. Unfortunately, a 2005 study published in *Arthritis Research and Therapy* found that B6 supplementation did not decrease inflammation in individuals with RA, and other studies have not found it to be useful in reducing inflammatory markers in the blood. Although B6 deficiency is rare, it's associated with low immune function and high blood levels of homocysteine, which increases the risk of heart disease.

RECOMMENDED DOSAGE: 1.3 mg daily for adults younger than 50; 1.5 mg for women older than 50 and 1.7 mg for

How To Get Your Share

Studies show that people with arthritis, particularly RA, tend to have lower-quality diets than those who don't have the disease. For this reason, many dietitians recommend that people with arthritis take a multivitamin. Although research is divided on how beneficial multivitamins really are, they “are inexpensive, cover all your vitamin and mineral bases, so to speak, and there's very little health risk, if any, in taking them,” says Sandon.

blood pressure and insulin regulation. A 2009 study in *The Journal of Clinical Rheumatology* showed that OA progresses and worsens in individuals with low D levels compared with those who get adequate amounts. And in 2004, the Iowa Women's Health study reviewed the diets of thousands of women and found that higher intakes of vitamin D were associated with a lower risk for RA, and vice versa.

"The connection isn't completely understood, but low levels of vitamin D appear to result in higher levels of inflammation-causing cytokines," says Sandon. The body also uses vitamin D to build and maintain strong bones. However, corticosteroids such as prednisone can impair vitamin D absorption, so people who take these medications need more of it.

Several studies have shown that people with chronic pain are more likely to have inadequate levels of vitamin D, and for this reason, it's often prescribed for fibromyalgia. A 2009 placebo-controlled study in the journal *Endocrine Practice* found that the majority of patients treated with 5,000 IUs of D3 for eight weeks saw a reduction in the overall impact of their fibromyalgia but did not have significant improvement in musculoskeletal symptoms.

RECOMMENDED DOSAGE: The current RDA is 400 IU daily; 600 for adults age 71 and older. However, because of recent research, that amount is believed to be lower than it should be, and many health professionals recommend closer to 600 to 1,000 IUs daily.

PRECAUTIONS: Vitamin D increases calcium absorption and may increase the risk of high blood calcium. In a 2006 study, women who took 1,000 mg of calcium and 400 iu of vitamin D daily over seven years, had a slightly increased (17 percent) risk of developing kidney stones. Don't exceed 2,000 IUs daily without a doctor's supervision.

Best Food Sources: Fortified milk and orange juice; cod liver oil and fatty fish like salmon, tuna, sardines and mackerel

Vitamin E

WHAT WE KNOW: Vitamin E is one of the most widely used supplements – nearly a quarter of adults older than age 55 take it regularly. But new studies suggest that the antioxidant doesn't have many health benefits, particularly when consumed in supplement form. A study in the *Journal of the American Medical Association* found that long-term vitamin E supplementation did not prevent cancer or major cardiovascular problems – and in large amounts, actually increased the risk of heart failure. Similarly, an analysis of several studies, in the *Annals of Internal Medicine*, revealed that a daily intake of 400 IUs of vitamin E or more was linked to an increase in death from all medical causes, leading the study authors to recommend that high doses of the supplement be avoided. What's more, a 2007 study in *Rheumatology* found that vitamin E did not improve OA symptoms.

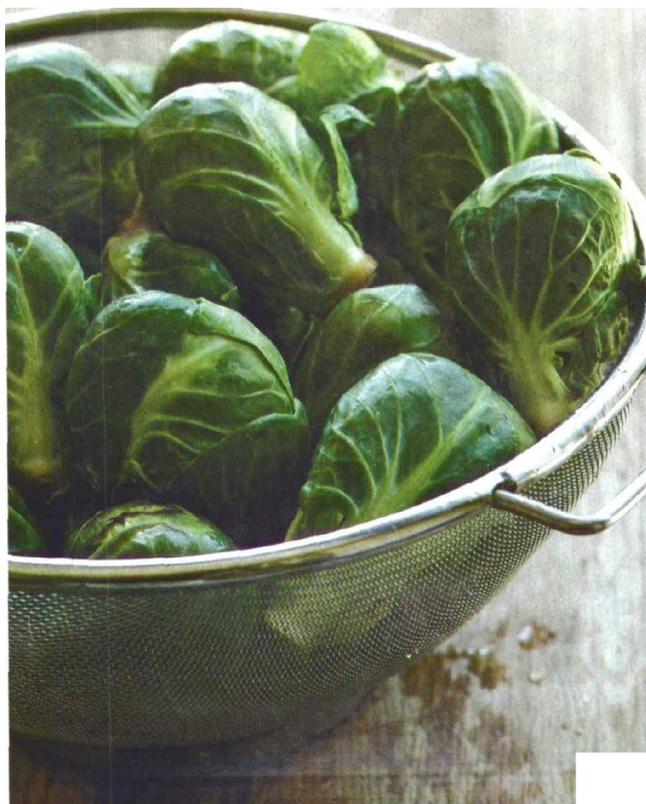
RECOMMENDED DOSAGE: Adults need about 15 mg daily, preferably from dietary sources. Most multivitamins contain a little E, and it's OK to consume it in that form, says Sandon.

PRECAUTIONS: Vitamin E supplements can keep blood from clotting properly and may increase the risk of bleeding, including strokes. Supplements may also interfere with medications like blood thinners and cholesterol drugs and may reduce the effectiveness of cancer treatments.

Best Food Sources: Nuts, seeds, oils like sunflower, safflower, corn and soybean

Vitamin K

WHAT WE KNOW: Early animal studies suggest that vitamin K may damage and even kill inflammatory cells that contribute to arthritis and other autoimmune diseases, and at least one human study found that higher concentrations of vitamin K were associated with decreased inflammatory markers. A recent study in *Arthritis & Rheumatism* also revealed that low vitamin K was associated with OA of the knee and hand. "We [found] that vitamin K deficiency appears to be associated with increased risk of developing radiographically detectable



osteoarthritis as well as cartilage abnormalities on MRI,” says study author Tuhina Neogi, MD, PhD, associate professor of medicine at Boston University School of Medicine. Dr. Neogi says that vitamin K-dependent proteins regulate tissue mineralization, and the absence of vitamin K diminishes the proteins’ functioning, which can lead to abnormalities in bone and cartilage. She stresses that more research needs to be conducted before use of vitamin K supplementation is recommended in humans.

RECOMMENDED DOSAGE: 120 mcg daily for men; 90 mcg for women. Note: “There’s no evidence that taking vitamin K in supplement form, beyond what’s contained in a multivitamin, is a good idea,” says Sandon. Not all multivitamins contain K; if yours doesn’t, it’s best to try to consume more from food sources.

PRECAUTIONS: Vitamin K can interact with blood thinners, including warfarin.

Best Food Sources: Green leafy vegetables, Brussels sprouts, broccoli and cranberries, as well as oils, like soybean, olive and canola

Zinc

WHAT WE KNOW: Zinc is a trace element that plays a role in numerous cellular functions in the body, including the growth and maintenance of articular cartilage. Research has shown that it also helps increase bone mass and plays a crucial role in wound healing. Some studies have suggested that individuals with OA and RA have lower zinc levels, leading researchers in a 2008 British study in *Best Practice & Research: Clinical Rheumatology* to suggest that those with inflammatory diseases, including RA, should be sure they’re getting enough zinc in their diets. Government studies have found that up to 45 percent of adults older than age 60 don’t get enough.

RECOMMENDED DOSAGE: 8 mg a day for women and 11 mg a day for men.

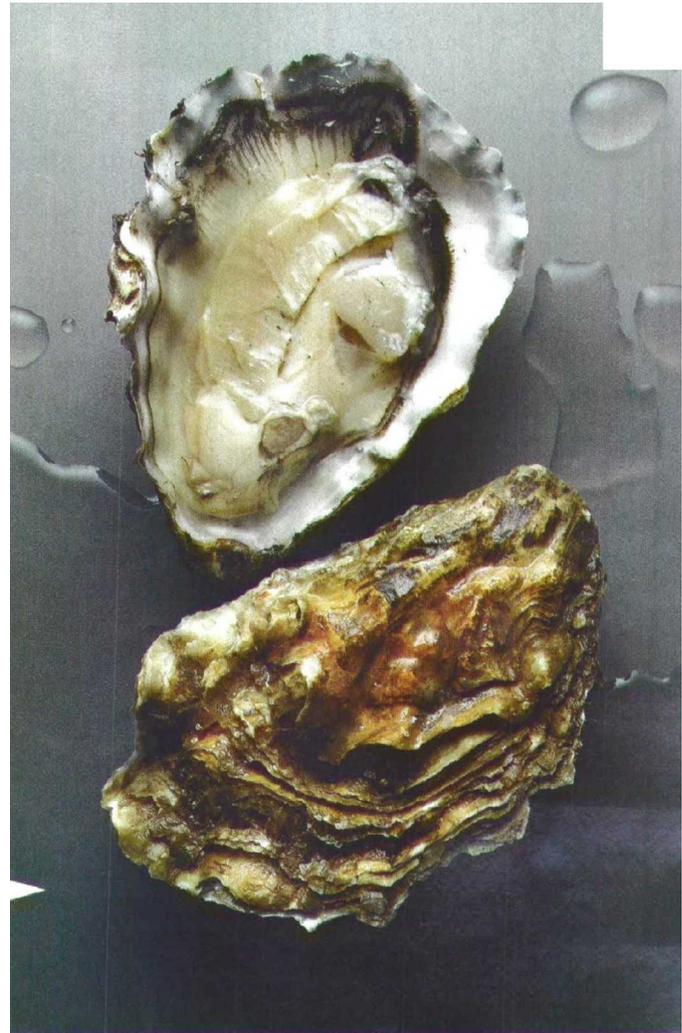
PRECAUTIONS: High intakes of zinc (4,000 mg) have been associated with gastrointestinal distress like vomiting and cramps. At doses of 150 to 450 mg daily, it can also inhibit the body’s ability to absorb copper, another crucial mineral, which is important for functioning of the brain and nervous system. Ⓢ

Best Food Sources: Shellfish including oysters, lobster and crab; most types of meat; yogurt and cashews.

Camille Noe Pagán is a freelance writer in New York City.



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Find out at www.ArthritisToday.org/SO10.



How Much Is Too Much?

Given that everything from energy bars to orange juice is now fortified with added vitamins and minerals, should you be worried about getting too many nutrients? In most cases, no, says Sandon. “The truth is, in spite of fortification, most individuals with arthritis fall short of their nutritional needs.” Plus, the body flushes out many vitamins and minerals when they’re consumed in excess. Some minerals, such as zinc, and fat-soluble vitamins (A, D, E and K) tend to stay in your system for longer periods of time, but take very high doses to reach toxicity. That said, Sandon advises erring on the side of caution, avoiding super-fortified foods (like meal replacement bars or vitamin shakes such as Ensure) unless your doctor or dietitian instructs otherwise.