

# Benefits of Magnesium Is Far Greater Than Previously Imagined

By [Dr Mercola](http://www.mercola.com), [www.mercola.com](http://www.mercola.com) | November 5, 2014 | Last Updated: November 5, 2014 10:29 am



You don't hear much about magnesium, yet an estimated 80 percent of Americans are deficient in this important mineral and the health consequences of deficiency are significant. One reason could be because magnesium, like vitamin D, serves so many functions it's hard to corral.

As reported by GreenMedInfo, researchers have now detected 3,751 magnesium binding sites on human proteins, indicating that its role in human health and disease may have been vastly underestimated.

Magnesium is also found in more than 300 different enzymes in your body, which are responsible for:

Creation of ATP (adenosine triphosphate), the energy molecules of your body	Proper formation of bones and teeth	Relaxation of blood vessels
Action of your heart muscle	Promotion of proper bowel function	Regulation of blood sugar levels

## The Health Benefits of Magnesium have Been Vastly Underestimated

A number of studies have previously shown magnesium can benefit your blood pressure and help prevent sudden cardiac arrest, heart attack, and stroke. For example, one meta-analysis published earlier this year in the American Journal of Clinical Nutrition looked at a total of seven studies collectively covering more than 240,000 participants. The results showed that dietary magnesium intake is inversely associated with risk of ischemic stroke.

But its role in human health appears to be far more complex than previously thought, and—like vitamin D—its benefits may be more far-reaching than we've imagined. GreenMedInfo.com's database project has indexed over 100 health benefits of magnesium so far, including therapeutic benefits for:

Fibromyalgia	Atrial fibrillation	Type 2 diabetes	Premenstrual syndrome
Cardiovascular disease	Migraine	Aging	Mortality

According to the featured report:

*"The proteome, or entire set of proteins expressed by the human genome, contains well over 100,000 distinct protein structures, despite the fact that there are believed to be only 20,300 protein-coding genes in the human genome. The discovery of the "magneseome," as its being called, adds additional complexity to the picture, indicating that the presence or absence of adequate levels of this basic mineral may epigenetically alter the expression and behavior of the proteins in our body, thereby altering the course of both health and disease."*

Magnesium also plays a role in your body's detoxification processes and therefore is important for helping to prevent damage from environmental chemicals, heavy metals and other toxins. Even glutathione, your body's most powerful antioxidant that has even been called "the master antioxidant," requires magnesium for its synthesis.

## Signs of Magnesium Deficiency

There's no lab test that will give you a truly accurate reading of the magnesium status in your tissues. Only one percent of magnesium in your body is distributed in your blood, making a simple sample of magnesium from a blood test highly inaccurate. Other tests that your doctor can use to evaluate your magnesium status include a 24-hour urine test, or a sublingual epithelial test. Still, these can only give you an estimation of your levels, and doctors typically need to evaluate them in conjunction with the symptoms you exhibit.

An ongoing magnesium deficiency can lead to more serious symptoms, including:

Numbness and tingling	Muscle contractions and cramps	Seizures
Personality changes	Abnormal heart rhythms	Coronary spasms

With that in mind, some early signs of magnesium deficiency to keep an eye out for include:

- Loss of appetite
- Headache
- Nausea and vomiting
- Fatigue and weakness

## One of the Best Ways to Optimize Your Magnesium Levels

If you suspect you are low in magnesium one of the best ways to consume this mineral is through organically bound magnesium, found in whole foods. As explained in the featured article:

*"Chlorophyll, which enables plants to capture solar energy and convert it into metabolic energy, has a magnesium atom at its center. Without magnesium, in fact, plants could not utilize the sun's light energy."*

In many ways chlorophyll is the plant's version of our hemoglobin as they share a similar structure but have magnesium plugged in the middle rather than iron. Green leafy vegetables like spinach and Swiss chard are excellent sources of magnesium, as are some beans, nuts and seeds, like almonds, pumpkin seeds, sunflower seeds and sesame seeds. Avocados are also a good source. Juicing your vegetables is an excellent option to ensure you're getting enough of them in your diet.

In order to ensure you're getting enough, you first need to be sure you're eating a varied, whole-food diet like the one described in my [nutrition plan](#). But there are other factors too, that can make you more prone to magnesium deficiency, including the ailments listed below. If any of these conditions apply to you, you may want to take extra precautions to make sure you're getting a sufficient amount of magnesium in your diet, or, if needed, from a magnesium supplement, in order to avoid magnesium deficiency.

An unhealthy digestive system, which impairs your body's ability to absorb magnesium (Crohn's disease, leaky gut, etc.)	Alcoholism — up to 60 percent of alcoholics have low blood levels of magnesium
Unhealthy kidneys, which contribute to excessive loss of magnesium in urine	Age — older adults are more likely to be magnesium deficient because absorption decreases with age and the elderly are more likely to take medications that can interfere with absorption
Diabetes, especially if it's poorly controlled, leading increased magnesium loss in urine	Certain medications — diuretics, antibiotics and medications used to treat cancer can all result in magnesium deficiency

## Foods with the Highest Amounts of Magnesium

Most people can keep their levels in the healthy range without resorting to supplements, simply by eating a varied diet, including plenty of dark-green leafy vegetables. One important point to mention though is that the levels of magnesium in your food are dependent on the levels of magnesium in the soil where they're grown. Organic foods may have more magnesium, as most fertilizer used on conventional farms relies heavily on nitrogen, phosphorous, and potassium instead of magnesium.

The featured article lists more than 20 specific foods that are exceptionally high in magnesium, including the following (for the full list, please see the original report). All portions are listed equate to 100 grams, or just over three ounces:

Seaweed, agar, dried (770 mg)	Spices, basil, dried (422 mg)
Spice, coriander leaf, dried (694 mg)	Flaxseed (392 mg)
Dried pumpkin seeds (535 mg)	Almond butter (303 mg)
Cocoa, dry powder, unsweetened (499 mg)	Whey, sweet, dried (176 mg)

## Different Types of Magnesium Supplements

If for whatever reason you decide you need a supplement, be aware that there are a wide variety of

magnesium supplements on the market, which includes Magnesium glycinate, Magnesium carbonate, and Magnesium citrate. Courtesy of the fact that magnesium must be bound to another substance. There's simply no such thing as a 100% magnesium supplement. The substance used in any given supplement combination can affect the absorption and bioavailability of the magnesium, and may provide slightly different, or targeted, health benefits:

**Magnesium glycinate** is a chelated form of magnesium that tends to provide the highest levels of absorption and bioavailability and is typically considered ideal for those who are trying to correct a deficiency

Magnesium oxide is a non-chelated type of magnesium, bound to an organic acid or a fatty acid. Contains 60 percent magnesium, and has stool softening properties

Magnesium chloride / Magnesium lactate contain only 12 percent magnesium, but has better absorption than others, such as magnesium oxide, which contains five times more magnesium

**Magnesium sulfate / Magnesium hydroxide** (milk of magnesia) are typically used as a laxative. Be aware that it's easy to overdose on these, so **ONLY** take as directed

**Magnesium carbonate**, which has antacid properties, contains 45 percent magnesium

Magnesium taurate contains a combination of magnesium and taurine, an amino acid. Together, they tend to provide a calming effect on your body and mind

**Magnesium citrate** is magnesium with citric acid, which has laxative properties

Magnesium threonate is a newer, emerging type of magnesium supplement that appears promising, primarily due to its superior ability to penetrate the mitochondrial membrane, and may be the best magnesium supplement on the market

## Balance Your Magnesium with Calcium, Vitamin K2 and D

One of the major benefits of getting your nutrients from a varied whole food diet is that you're far less likely to end up with too much of one nutrient at the expense of others. Foods in general contain all the cofactors and needed co-nutrients in the proper amounts for optimal health, which takes out the guess work. When you're using supplements, you need to become a bit more savvy about how nutrients influence and synergistically affect each other.

For example, it's important to maintain the proper balance between magnesium, calcium, vitamin K2, and vitamin D. Lack of balance between these nutrients is why calcium supplements have become associated with increased risk of heart attacks and stroke, and why some people experience vitamin D toxicity.

Part of the explanation for these adverse side effects is that vitamin K2 keeps calcium in its appropriate place. If you're K2 deficient, added calcium can cause more problems than it solves, by accumulating in the wrong places. Similarly, if you opt for oral vitamin D, you need to also consume it in your food or take supplemental vitamin K2. Taking mega doses of vitamin D supplements without sufficient amounts of K2 can lead to vitamin D toxicity symptoms, which includes inappropriate calcification.

While the ideal or optimal ratios between vitamin D and vitamin K2 have yet to be elucidated, Dr. Kate Rheaume-Bleue (whom I've interviewed on this topic) suggests that for every 1,000 IU's of vitamin D you take, you may benefit from about 100 micrograms of K2, and perhaps as much as 150-200 micrograms (mcg). The latest vitamin D dosing recommendations, which call for about 8,000 IU's of vitamin D3 per day if you're an adult, means you'd need in the neighborhood of 800 to 1,000 micrograms (0.8 to 1 milligram/mg) of vitamin K2.

Now, getting back to magnesium...

Magnesium may actually be more important than calcium if you are going to consider supplementing. However, maintaining an appropriate calcium-to-magnesium ratio is important regardless. Research on the paleolithic or caveman diet has shown that the ratio of calcium to magnesium in the diet that our bodies evolved to eat is 1-to-1. Americans in general tend to have a higher calcium-to-magnesium ratio in their diet, averaging about 3.5-to-1.

Magnesium will also help keep calcium in your cells so they can do their job better. In many ways it serves as nutritional version of the highly effective class of drugs called calcium channel blockers, used in the treatment of high blood pressure, angina, and abnormal heart rhythms. Magnesium and vitamin K2 also complement each other, as magnesium helps lower blood pressure, which is an important component of heart disease.

So, all in all, anytime you're taking any of the following: magnesium, calcium, vitamin D3 or vitamin K2, you need to take all the others into consideration as well, since these all work synergistically with each other.

*\*Image of "coriander" via Shutterstock*

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