

Is Magnesium the Missing Link in Your Heart Healthy Routine?

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STORY AT-A-GLANCE

- › Magnesium is important to the health of every cell and organ, playing a role in over 600 different reactions in your body
- › Research demonstrates the vital role magnesium plays in your cardiovascular health, reducing your risk for hypertension, stroke, heart attack and coronary artery calcification
- › Your body loses magnesium with sweating, certain drugs and when you are insulin-resistant; improve your levels through good dietary choices or taking a supplement balanced with vitamin K2, vitamin D3 and calcium

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Magnesium is a mineral important to the health of every cell and organ in your body, especially your heart, kidneys and muscles. Symptoms of a deficiency can include unexplained fatigue or muscle weakness, abnormal heart rhythms, eye twitches and muscle spasms.

Unfortunately, determining a deficiency of magnesium from a simple blood sample isn't possible, as only 1% of the magnesium in your body is found in your blood stream. Instead, most of your magnesium will be found stored in your bones and organs.

It is quite possible to be unaware of a deficiency, which is why it has been dubbed the "invisible deficiency." Researchers estimate that up to 75% of Americans do not get

enough magnesium from their diet to replace the magnesium lost.¹

Studies have also demonstrated that only 25% of U.S. adults are getting the recommended daily amount of 310 to 320 milligrams (mg) for women and 400 to 420 mg for men.² Even more concerning to your overall health, these amounts are just enough to stop your body from experiencing the overt symptoms of a deficiency, but not enough to support optimal health.

Adequate Levels of Magnesium Linked to Improved Heart Health

In one study, researchers conducted a dose-response meta-analysis of over 40 studies with over 1 million participants, published between 1999 and 2016,³ looking for a correlation between **magnesium** intake and diabetes, cardiovascular disease (CVD) and all-cause mortality.

They found no significant association between increasing the intake of magnesium above 100 mg per day and the risk of CVD or congestive heart disease (CHD).⁴

However, the same increase in magnesium intake per day was linked with a 22% reduction in the potential risk of heart failure and a 7% decrease in the risk of stroke. The increase in magnesium was also linked to a 10% drop in the risk of death from all causes and a 19% drop in the potential risk of diabetes.⁵

While the analysis was based on observational studies and did not prove a direct link, researchers wrote that the results of their meta-analysis supported the theory that increasing your daily dietary intake of magnesium may provide you with overall health benefits.⁶

A deficiency of magnesium at the cellular level can lead to a deterioration of metabolic and mitochondrial function at the cell level, and lead to more serious health problems.

Although a mineral, **magnesium also functions as an electrolyte**, crucial in electrical activity throughout your body.⁷ Without healthy levels of electrolytes, such as calcium,

magnesium or potassium, electrical signals throughout your body aren't sent and received properly, affecting your heart, brain and muscle function.

Cardiovascular Health Has a Significant Public Health Impact

Cardiovascular diseases claim more lives than all forms of cancer combined.⁸ In the U.S., someone has a heart attack every 40 seconds and someone dies every 33 seconds from a cardiovascular disease.⁹ The impact of CVD is not limited to your health and finances, but creates a large cost to the community and your employer.

Immediate costs include hospitalization, ambulance, diagnostic tests and immediate treatments, including surgery. Long-term costs include drugs, time off work and cardiac rehabilitation. The combined direct and indirect costs were estimated to be \$444 billion in 2010, or \$1 of every \$6 spent on health care.¹⁰

Heart disease is the leading cause of death in women, killing 398,086 in 2013.¹¹ Although it is sometimes thought of as a man's problem, approximately the same number of men and women die from CVD each year.

Unfortunately, symptoms in women are less obvious than they are in men, with 64% of women who die from CVD having no previous symptoms.¹²

Magnesium May Be Key to Controlling Your Blood Pressure

One in every 3 adults in America suffers from hypertension, or high blood pressure.¹³ Having high blood pressure increases your risk of having heart disease and stroke, and only 1 in 4 people with hypertension have their condition under control.¹⁴

Magnesium has a direct effect on the relaxation of vascular smooth muscle and the regulation of ions important to blood pressure control. **Hypertension** is labeled the "silent killer" as there are usually no symptoms of the condition or warning signs.

A meta-analysis funded by the Indiana University School of Medicine Strategic Research Initiative made a direct link between those who were deficient in magnesium and

hypertension.¹⁵ Lead author, Dr. Yiqing Song, professor of epidemiology at Indiana University, noted:¹⁶

"With its relative safety and low cost, magnesium supplements could be considered an option for lower high blood pressure in high-risk persons or hypertension patients.

Consistent with previous studies, our evidence suggests that the anti-hypertensive effect of magnesium might be only effective among people with magnesium deficiency or insufficiency.

Such suggestive evidence indicates that maintenance of optimal magnesium status in the human body may help prevent or treat hypertension."

Since approximately 80% of Americans are deficient in magnesium and 33% suffer from hypertension, balancing your magnesium levels may be the strategy you need to prevent the development of hypertension.

As blood pressure is related to the relative stiffness of your arteries, it is important to note blood levels of magnesium are also associated with **coronary artery calcification (CAC)**.¹⁷

Past studies demonstrated this association in patients suffering from chronic kidney disease, but this study found the same correlation in an otherwise healthy population. Participants in this study were without signs of CVD.

Those with the highest serum level of magnesium enjoyed a 48% lower risk of hypertension, 69% lower risk of Type 2 diabetes and a 42% lower risk of an elevated CAC score.

Magnesium Is Essential to Overall Health

In this short video you'll discover some of the more common symptoms of magnesium deficiency. However, don't rely on experiencing these symptoms before evaluating

lifestyle choices that deplete your magnesium stores and dietary choices that may not provide you with enough daily magnesium.

Magnesium is involved in over 600 different reactions in your body, and so is important to your overall health.¹⁸ Other cardiovascular benefits of magnesium include reducing your potential risk for atherosclerosis, or thickening and stiffening of the arterial walls.¹⁹

Low levels of magnesium have been associated with the risk of developing fatal cardiac arrhythmias. There are several different types of arrhythmias, but each have an abnormal electrical conduction that governs your heart rate and heartbeat.²⁰

Optimal levels of magnesium may also reduce your potential risk for developing painful and debilitating migraine headaches.²¹ In fact, some studies suggest magnesium can help prevent and treat [migraine headaches](#).^{22,23}

Magnesium plays an essential role in brain function and mood stabilization. Low levels of magnesium are connected with depression as well.²⁴ Magnesium is important to your metabolism and has a significant impact on Type 2 diabetes. Some experts believe that up to 48% of people suffering from diabetes are magnesium-deficient.²⁵

Low magnesium levels also affect insulin resistance, important in metabolic syndrome and a precursor to [Type 2 diabetes](#).²⁶ High levels of insulin in the blood, common with insulin resistance, lead to further loss of magnesium.²⁷

Lifestyle Choices That Deplete Magnesium

In this short video, Dr. Carolyn Dean discusses magnesium deficiency and the effect it has on your health. One of the primary reasons for a magnesium deficiency is a diet rich in processed foods. Heat and processing depletes magnesium from real foods. Experts believe low levels of magnesium may be the result of low levels found in food.²⁸

Magnesium is also lost through sweating during heavy exertion, as a result of lack of sleep and alcohol consumption. Certain drugs tend to reduce the amount of magnesium in your body, such as antibiotics, proton pump inhibitors and corticosteroids.²⁹

Unfortunately, there is no easy blood test to determine your magnesium levels. Some specialty labs do provide an RBC magnesium test that can give you a reasonable estimate, but the test is costly and not all labs can do the testing. **Serum levels of magnesium** are not a good indication of whether your muscles and bones have enough magnesium for optimal health. Perhaps the best way to determine your status is to carefully evaluate and track your symptoms.

Symptoms of low levels of magnesium are related to the functions the mineral plays in your body. Muscle spasms, heart arrhythmias, anxiety, nausea and high blood pressure are some of the signs and symptoms of magnesium insufficiency.³⁰ Muscle spasms present as a "Charlie horse," or spasm in your calf muscle, that happens when you stretch your leg.

An increased number of migraines or **headaches**, loss of appetite and fatigue are other early signs of magnesium deficiency. More chronic and serious symptoms include abnormal heart rhythms, coronary spasms and seizures, as well as changes in personality and behavior.

Magnesium Threonate Best Magnesium Supplement?

Magnesium threonate is often considered the best form of magnesium for enhancing cognitive functions because it is uniquely effective at increasing magnesium levels in the brain. Unlike other forms of magnesium, magnesium threonate has the ability to cross the blood-brain barrier, a critical factor in its efficacy.

This capability allows it to directly influence brain health by supporting synaptic density and plasticity, which are essential for learning and memory. Studies suggest that increasing brain magnesium levels can lead to improved memory, enhanced learning abilities, and overall better cognitive function.

Additionally, magnesium threonate has been shown to potentially alleviate symptoms of anxiety and depression, making it a multifaceted supplement for mental health and cognitive performance. Its targeted action on the brain sets it apart from other

magnesium supplements, which may be more beneficial for bone health, muscle function, and general metabolism but less impactful on neurological health.

Balance a Magnesium Supplement With Calcium, Vitamin D3 and Vitamin K2

Since magnesium is inexpensive, safe and readily available, you may want to consider supplementation. There are also instances when supplementation is particularly advisable:³¹

- You have suffered or are at risk of a heart attack
- You have experienced ventricular arrhythmia
- You have had or are planning heart transplant or open heart surgery
- You are taking diuretics
- You have hypertension or **congestive heart failure**

There are several considerations if you choose to take a supplement as it is easy to end up with lopsided nutrient ratios. In general, most real foods have most of the cofactors and other nutrients in the correct ratios. It is important to maintain the proper balance between vitamin K2, vitamin D, magnesium and calcium. Considerations include:

- The ideal ratio between magnesium and calcium is currently thought to be 1-to-1. Keep in mind that since you're likely getting far more calcium from your diet than you are magnesium, your need for supplemental magnesium may be two to three times greater than calcium.
- Vitamin K2 (MK7 form) has two crucial functions, one is in cardiovascular health and the other is in bone restoration. By removing calcium from the lining of the blood vessels and shuttling it into your bone matrix, vitamin K2 helps prevent occlusions from atherosclerosis. Meanwhile, vitamin D helps optimize calcium absorption.

- Vitamins D and K2 also work together to produce and activate Matrix GLA Protein (MGP), which congregates around the elastic fibers of your arterial lining, thereby guarding your arteries against calcium crystal formation. Magnesium and vitamin K2 also complement each other, as magnesium helps lower blood pressure, which is an important component of heart disease.
- While the ideal or optimal [ratios between vitamin D and vitamin K2](#) have yet to be determined, Dr. Kate Rheaume-Bleue (whom I've interviewed on this topic) suggests taking 100 micrograms (mcg) of K2 for every 1,000 to 2,000 international units (IUs) of vitamin D you take.

I strongly recommend getting your vitamin D level tested twice a year (summer and winter) to help determine your personal recommended dosage. Sensible sun exposure is the ideal way to optimize your levels, but if you opt for a supplement, your "ideal dosage" is one that will put you into the therapeutic range of 60 to 80 nanograms per milliliter (ng/ml).

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