

# What You Really Need to Know About Magnesium

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The content of this document is edited, and excerpted, in part, from "**The Magnesium Factor**", authored by Mildred S. Seelig, M.D., MPH, and Andrea Rosanoff, Ph.D. It is also supported by virtually all of the research we could find on the subject conducted since the early 1980's.

It's not certain which came first, but at the same time the heart disease epidemic of the twentieth century was accelerating, so was the reliance on modern processed foods. There are so many things wrong with such a diet, it's hard to know where to start, but it's high in fat, especially saturated fat; high in cholesterol; high in sugar and also high in salt, just for starters. (Several poignant, related articles appear on the **Featured Article** section on this website) We hear a lot about these short-comings, but very little is said about the fact that such a diet is also low in magnesium, significant because hearts and blood vessels need magnesium to stay healthy. Magnesium deficiency underlies much of the disease epidemic that consumes so many of our health-care dollars.

Numerous studies have linked low magnesium with many of the major risk factors for heart disease. Other studies show that the average Western processed-food diet is even lower in magnesium than is commonly acknowledged. The negative effects of a low intake of magnesium are exacerbated by the high levels of fat, sugar, sodium, and phosphate in this type of diet. Ironically, it can also be worsened by the use of calcium supplements, which has become widespread because of our awareness of calcium's value for bone health, and the exaggerated claims of those promoting calcium as a "cure-all". We'll get back to this phenomenon later in the article. Unfortunately, the studies that have been done on low magnesium, and its impact on heart health, have gone unheeded, so much so that much of the heart disease seen today is a direct result of low magnesium consumption. This vitally important nutrient is not only inadequate in much of our processed foods, but also in our water supplies, and just at a time in history when our stressful lifestyle demands that we have more of this important mineral.

We can't possibly consider everything published on the subject in this brief article, but let's look at some of the convincing evidence that magnesium deficiency can, in fact, cause heart disease. Both animal and clinical studies have shown that chronic magnesium depletion has direct consequences for both

the heart and the blood vessels. These include the following:

**Arrhythmias:** (irregular heart rhythms) and tachycardia (too-rapid heartbeats) due to abnormal shifts of the mineral potassium into and out of heart cells.

**Abnormal electrical activity** in the heart, shown by electrocardiogram (EKG or ECG) results.

**Arteriosclerosis:** (stiffening and inflexibility of the blood vessels). Constriction of the arteries and spasms in blood vessels.

**High blood pressure**

**Angina:** (chest pain due to heart disease).

**Myocardial infarction:** (damage to heart cells - better known as a heart attack) due to is-chemic heart disease (an insufficient flow of oxygenated blood to the heart) that 's associated with too much calcium and not enough magnesium in heart cells.

**Sudden death** due to arrhythmia or infarction.

**The formation of blood clots** within blood vessels, which can lead to heart attack or stroke.

**Heart valve disorders** such as mitral valve prolapse.

**Because it's all they know to do**, the medical profession has responded to all of these symptoms by treating each one, individually, using drugs, or surgery, or both. The result is, the symptoms that may stave off death do get treated, but the treatment doesn't restore health. How much better it would be to prevent much of the damage from this disease, by treating the magnesium deficiency that underlies all of its symptoms. In other words, give the body the simple nutrient it needs for healthy hearts and blood vessels.

Animal studies also show that even low magnesium levels will adversely affect the heart and blood vessels. Clinical studies show that treatment with magnesium, taken at the right time and in the right amount, can lessen heart disease risk factors and even save lives. In addition to the live animal and clinical studies, research has found that there exists very low levels of magnesium in the heart muscle of people who have died of heart disease. In one study, the hearts of such individuals had 24 percent less magnesium than did the hearts of people who had died in accidents. Other studies on cadaver

hearts classified by cause of death - heart disease vs accidents - showed that the "heart-disease" hearts had anywhere from **12 to 27 percent less** magnesium than the other hearts. Beyond that, damaged areas of hearts from people who had died of heart disease had **40 to 50 percent less** magnesium than undamaged areas of the same hearts.

In other studies, cadaver hearts from people who had lived in areas with hard drinking water had higher amounts of magnesium in them - 6 or 7 percent higher, on average, than cadaver hearts from soft-water areas. Maybe this is why death rates from heart disease are lower in hard-water communities. But it wasn't until the late 50's that epidemiological studies (research on populations) pointed to the association. Beginning with a Japanese study, done in 1957, and followed by more studies from places like South africa, England, Finland, and the United states, among others, they all revealed that, when the hardness of drinking water went up, the rate of death from cardiovascular disease went down. It was obvious that there was something about hard water that protected people from heart disease death.

Continued research soon showed that the protective water factor, in most cases, was none other than magnesium . Calcium, another hard water component, can also be protective because it makes water less corrosive and less likely to leach toxic trace minerals, such as cadmium and lead, out of metal pipes. Calcium also shares its direct effect - interfering with the absorption of fat from the intestines - with magnesium. But, the studies proved it was now time to take magnesium seriously.

Magnesium is a vital structural component of all muscle cells, and the heart is mainly muscle. Heart muscle, when healthy, contains even more magnesium than other muscles do. And when magnesium levels drop, they can drop more in heart muscle cells than in other muscles. Each molecule of myosin (muscle protein) has an atom of magnesium in it. Muscles therefore have to have magnesium to work. About 27 percent of the body's magnesium is in muscle tissue. If a magnesium deficiency begins to affect the heart's muscle cells and the "nervous conduction system" of the heart, this organ, which must beat regularly and continuously, may run into trouble.

The availability of magnesium within the heart affects the rhythm of the heart, both directly and indirectly, by controlling potassium and calcium levels. This also affects the conduction system. A low level of magnesium in the heart muscle cells can bring on heart arrhythmias, ranging from the merely disturbing, such as palpitations, to the severe, including disturbances that can be life-threatening.

Blood vessel muscle cells need healthy amounts of magnesium to relax properly

after each contraction. They can become stiff and inflexible if their magnesium gets too low. Magnesium is a necessary catalyst for all sorts of life reactions. For example, among the enzymes that have been studied intensively, over 350 of them need magnesium, directly, to do their jobs properly. Zinc is required for about 200 enzymes; copper, for less than 20; and selenium, for only 10 that have been identified in animal studies so far. Without adequate magnesium, these enzymes either will not act or will act at the wrong rate or at the wrong time - or both.

In addition to the more than 350 enzymes for which magnesium is directly necessary, it is indirectly required for thousands of others. One especially important reaction that needs magnesium is the one that controls the molecule adenosine triphosphate, or ATP. ATP is present in all the living world. You can think of it as life's batteries - a substance that can store and release energy back and forth, like a switch. But to do so, it needs magnesium.

Again, literally every energy-consuming reaction in life involves ATP, but it needs magnesium to proceed. This is what puts the number of enzymes that need magnesium into the thousands. Truth be known, it would be very difficult to over-estimate the importance of magnesium in enzyme function, both directly (as a co-factor), and indirectly (via ATP reactions).

Muscle contraction requires energy, and thus requires ATP, and magnesium. The pumping heart is a muscle that alternately contracts and relaxes. The contracting and dilating of blood vessels are due to muscles contracting and relaxing. All of this activity requires magnesium, both directly and indirectly, through ATP. It's no wonder that low magnesium levels can negatively affect the heart and its blood vessels.

In addition to all of its enzyme functions, magnesium is an important component of cell membranes. As a result, it is vitally important in regulating what goes into, and what comes out of, all the body's cells. This makes magnesium crucial to mineral balance. In simple solutions, such as salt water, all dissolved minerals are evenly dispersed. This is not so in living cells, where they're distributed differently, depending on their functions. This specialized distribution requires energy, and it's absolutely vital to life processes and health. Calcium and sodium ions, for the most part, are kept outside the cells, while magnesium and potassium are kept inside the cells. These four minerals are the most plentiful in the body, and collectively they are known as electrolytes.

When the level of magnesium within the cells falls below normal, calcium and sodium rush inside, while potassium and magnesium leak out. This can cause

big problems. If this occurs in heart muscle cells, normal function is impaired, and there is a tendency toward excess contractility, the shortening and thickening of functioning muscles. During cardiac surgery, this can cause what doctors call a "stone heart." In the arteries, this phenomenon can lead to stiffness and high blood pressure; drastic results, indeed. Doctors routinely prescribe calcium-channel-blocking drugs, like Captopril, to forestall this abnormal movement of calcium into cells because it is so dangerous for hearts and blood vessels. Magnesium is nature's calcium-channel blocker.

### **A Delicate Magnesium/Calcium Balance is Required:**

Magnesium and calcium are very similar in their chemistry, but biologically, these two elements function and react very differently. In effect, they are two sides of a physiological coin; they have actions that oppose one another, yet they function as a team.

#### **For example:**

Calcium exists mainly outside of cells, whereas almost all magnesium is found inside cells.

Calcium excites nerves, whereas magnesium calms them down.

Calcium (along with potassium) is necessary for muscle contractions, whereas magnesium is necessary for muscles to relax.

Calcium is necessary for the blood-clotting reaction, which is so necessary for wound healing, whereas magnesium keeps the blood flowing freely, and prevents abnormal coagulation within blood vessels, where clotting reactions would be dangerous.

Calcium is mostly found in bones and gives them much of their hardness, whereas magnesium is found mainly in soft structures.

Bone matrix, the soft structure within bone, contains protein and magnesium, and gives the bones some flexibility and resistance to brittleness.

The normal concentration of magnesium ion inside cells is easily 10,000 times more than that of intracellular calcium ions - under healthy conditions. But if the amount of magnesium in a cell falls, for any reason, calcium ions flow into the cell. With this abnormal situation, a couple of things happen:

Higher than normal calcium inside a cell excites a lot of reactions. It puts the cell into hyperactive state. Heart and blood-vessel cells are especially excitable because they need to react rapidly during sudden stress situation. As such, they are truly vulnerable to deficits in magnesium that allow abnormal

rises in calcium, with resulting hyperactivity. Sometimes, a hyperactive state is just what you want. It is the essence of the body's "fight-or-flight" reaction to danger. Without calcium, there is no muscle contraction, and without muscle contraction there is no fight or flight.

But in usual circumstances, you don't want excess muscle contractions. The muscles would soon cramp, bringing on severe muscle pain. To relax, the muscles need magnesium. Magnesium, physiologically the opposite of calcium, relaxes muscles. Under normal, healthy cellular conditions, magnesium levels inside muscle cells are high and calcium levels are low, so that the muscles can relax. This is just one way in which calcium enhances and allows the fight-or-flight reaction while magnesium calms it all down.

If calcium levels inside a cell get especially high because of low magnesium, the cell physically changes. High calcium tends to make things stiff and hard. But if soft tissue begins to get hard, it's a real problem - and the problem is calcification. In artery and heart cells, the stiffness caused by calcification hampers proper function and can be an important aspect of heart disease. If magnesium intake is low, a high calcium intake can make people more vulnerable to heart disease than are people who do not have a high calcium intake.

The current promotion of calcium-rich foods and supplements to protect our bones encourages the consumption of calcium. This is fine as long as magnesium nutrition is adequate. But calcium intakes that are unduly high, relative to magnesium, can intensify the problems caused by the low magnesium content of most modern diets. Clearly, calcium is an important essential nutrient, but it must be guarded and controlled, and balanced by adequate magnesium if it is not to cause damage to the cells, and the body as a whole.

For years, even though in nature the ratio does not exist, we have been encouraged to consume twice the amount of calcium as magnesium. **This can be dangerous**, for the reasons outlined above. A large and growing segment of researchers believe that the growing phenomenon of heart disease is the direct result of too much of a good thing ... calcium. In nature, magnesium can appear in ratios of **17 to 34:1** to calcium.

We also know that the human body can only assimilate 12.5 mg of organic calcium per day. Women, in particular, are often encouraged to take 800-1500 mg of calcium, daily, in spite of this fact. Of course, most calcium is inorganic, and almost worthless, anyway. So, we find a situation where most Americans are over dosing on poor calcium, rather than properly-dosing on natural,

organic calcium that is guaranteed to be fully and properly utilized by the body. That's not easy to find.

We believe that the finest, most balanced, and most effective mineral supplement available today is OR-ION Concentrated Mineral Complex. It comes to you straight from nature. The minerals are liquid, organic, ionic, charged with Fulvic acids, infused with subtle-energy technology, and found in ratios dictated by the Creator, not propagated and promoted by self-serving interests. 15-20 drops of OR-ION minerals, twice daily, will, in addition to all of the benefits offered by minerals, promote clarity of thought, and increased energy, something most people really need, today. You will find more information about OR-ION natural ionic minerals on the **Nutritional Supplement** section of this website. Try them, you'll really notice the difference, and you'll be well on your way to eliminating the unwanted, excess calcium in your body, and to achieving the mineral balance that will assure better health, in numerous ways. That's our story, and we're sticking to it.

I strongly believe in everyone taking more responsibility for their own health, and avoiding doctors and hospitals, if at all possible (My wife and I have successfully done that for well over 30 years). If you wonder why we feel that way, consider this, just for starters:

\* Doctors have become the third leading cause of DEATH in America! (See **Death by Friendly Fire** in this same section.)

\* 1 in 5 patients is completely MIS-diagnosed by their doctor!

\* Hospital errors cause an estimated 195,000 DEATHS every year!

\* Every year, an estimated 1 MILLION patients, nationwide, are injured DURING hospital treatment!

\* Your chances of being MIS-diagnosed in America's hospitals run from 67% to 75%!

\* 3 out of 4 doctors DON'T tell patients about the TOXIC effects of prescriptions!

\* NO more than 15% of medical interventions are supported by reliable scientific evidence!

\* 70% of doctors treating Medicare patients flunked an exam on prescribing for the elderly!

SHOCKING, BUT TRUE! I have prepared several powerful articles about this problem, and they appear on this same section on this website. They expose the truth about our "modern" ? medical system, and how its a much bigger threat to your life than terrorism, guns and lots of other things we are concerned about.

Thank you for taking the time to consider this information. If you have questions, or need more information about OR-ION Liquid Ionic Minerals, or any of the other world-class, all-natural, infused nutritional supplements we handle, call me at 800-829-9913, e-mail me at [ultrahealth@cs.com](mailto:ultrahealth@cs.com). **Lyle**