# MAGNESIUM: THE FORGOTTON MIRACLE NUTRIENT

## Part 1 of 2 Articles

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### Magnesium Misinformation is Widespread, Untreated, and Potentially Deadly!

There are hundreds of ways that our bodies utilize magnesium, which makes it impossible for science to identify its "most important function". This approach of looking for the single pivotal function of a supplement is based on the medical model of "one symptom, one diagnosis, and one drug." Science depends on this model to isolate one variable at a time for scientific testing. They don't seem to realize that it would be unreasonable and impossible to limit a food nutrient such as magnesium in that way, since it is involved in as many as 800 enzyme systems, affects 80 percent of the body's biochemistry, and interacts with dozens of other nutrients.

There are stacks of papers from researchers all over the world proving the value of magnesium. However, those thousands of papers, unfortunately, seem to have done nothing to make the public aware of the importance of magnesium. Researchers will just keep getting funding to repeat the same studies and doctors will continue to ignore them because they never learned anything about the clinical application of magnesium in medical school.

We can't wait for a multibillion-dollar clinical trial to "prove" that magnesium is a necessary nutrient. We have enough research showing its therapeutic value, safety, and efficacy. What's more, people can do their own personal clinical trial by following their magnesium RBC test results and taking magnesium as they watch their symptoms subside.

I have been studying magnesium and using it in my practice for almost 37 years. I discovered this incredible element during my clinical practice. I have since learned that magnesium is critical for the health of not only blood vessels, but also every tissue and organ in the body. Deficiencies of this essential element are linked to many maladies.

These include:

- Heart disease
- Strokes
- Atherosclerosis
- Abnormal kidney function
- Muscle weakness
- Diabetes
- Insulin resistance
- Metabolic syndrome
- Inflammation
- Excitotoxicity
- Neurodegenerative diseases
- Impaired lung function
- Cancer
- Immune system disorders

Magnesium has also been shown to be a major weapon against depression and even suicide.

## Doctors Misread Magnesium Levels

Unfortunately, most doctors know very little about magnesium, and they rarely order tests to determine if a patient is magnesium deficient. And even on the rare occasions when they do think to test magnesium levels, they usually test blood levels—which is a poor measure of body content. Why?

Because 99 percent of the magnesium in our bodies is located within the cells, only 1 percent is in the blood. Doctors who order a blood test and then tell their patients they have normal magnesium levels are not looking in the right place.

Several studies have shown that a person can be severely depleted of tissue and organ magnesium yet have perfectly normal blood levels.

## Key to Stopping Inflammation

After years of study, it is obvious to me that, in many instances, the damage done by a disease process comes not from outside the body, but rather from inside. In fact, the mechanisms activated by the body to protect itself in the short term can

– if activated persistently – result in considerable damage to tissues and organs in the long term.

A perfect example of this process is viral diseases. In most cases of persistent viral diseases such as herpes viruses and human papillomavirus (HVP), it is not the virus itself that destroys tissues and organs. Instead, it is the body's reaction to the viruses.

When viruses invade the body, the immune system is activated. It releases massive amounts of free radicals and lipid peroxidation products in an attempt to kill the virus. If the virus is not killed rapidly, thus allowing the immune system to return to normal, these oxidation products begin to destroy the body's surrounding tissues.

The same process occurs with exposure to any of the following:

- Industrial pollutants
- Toxic metals (mercury, aluminum, cadmium, and lead)
- Pesticides and herbicides
- Excess iron
- High levels of excitotoxins
- Oxidized fats

This is why normal cholesterol is harmless but oxidized cholesterol is so deadly. When cholesterol (or any other fat) is oxidized, it triggers chronic immune activation.

A subsequent release of storms of free radicals and lipid peroxidation products results in atherosclerosis (hardening of the arteries). This doesn't occur overnight: it takes decades – even a lifetime.

The same is true for cancer. The reason cancer takes so long to develop is that, in most cases, it results from chronic inflammation. Over many years, released free radicals damage the DNA, which results in activating cancer genes and cancer-promoting cell signaling processes.

Studies have shown that in the vast majority of cancers, a smoldering chronic inflammation existed for as long as 17 years before the cancer developed. For instance, HPV does not cause cervical cancer, as many people think. Rather, it

causes chronic cervical inflammation which eventually leads to cancer in a small percentage of women.

This explains why studies show that a number of nutrient supplements can drastically reduce cervical cancer even without curing the virus—because the supplements are all anti-inflammatory substances. We see the same thing with breast cancers and prostate cancers.

So how does magnesium play into all this? Magnesium has been shown to be a very powerful anti-inflammatory element, as well as an antioxidant.

Recent studies have shown that magnesium stops inflammation by inhibiting calcium-triggered inflammation pathways in cells. In one experiment, researchers used a substance known to induce severe inflammation (lipopolysaccharide) and found that if animals were given magnesium prior to exposure to the inflammatory chemical, the inflammation was drastically reduced.

Other studies have shown that calcium itself is a major trigger for inflammation, which should cause concern for everyone – especially women--who have been told to take large amounts of calcium supplements and drink milk to avoid osteoporosis. Magnesium counteracts this negative effect of calcium, which means that if you take calcium supplements, you should take magnesium as well. Animal studies have also shown that as magnesium deficiency gets worse, the release of proinflammatory chemicals (called cytokines) increases dramatically.

So, as your body becomes more inflamed with age, your risk increases for developing inflammation-related diseases such as hypertension, heart disease, cancer, neurodegeneration, and strokes. Unfortunately, magnesium deficiency is very common, especially in those who eat a Western diet in red meats, fats, and sugars, and low in fresh fruits and vegetables.

It is also known that carbonated sodas deplete the body's magnesium. Americans, both young and old, gulp down these dangerous sodas at a frantic pace.

As much as 75 percent of Americans eat diets deficient in magnesium, and two-thirds of these people are significantly deficient on proper laboratory testing.

## Low Magnesium and Heart Disease

Magnesium plays a major role in protecting all of the blood vessel in the body, especially the heart. A growing number of studies show that magnesium plays an important part in preventing heart failure, heart attacks, abnormal heart rhythms, and heart muscle degeneration. As a matter of fact, the number one storage area ini the body of magnesium is the heart!

Studies have shown that low magnesium intake, especially if extended over a long period, can cause significant damage to the heart and can eventually result in complete failure. Convincing evidence suggest this is because low magnesium triggers progressive inflammation of the heart, and even the infiltration of inflammatory white blood cells into the heart muscle.

Low magnesium also causes an elevation in a number of inflammatory, cell-signaling molecules called cytokines, such as interleukin-6 (IL-6) and TNF-alpha. Both of those substances are associated with a poor prognosis in cases of heart attack and congestive heart failure.

Studies have also shown that levels of another inflammatory substance, called P, rise in the heart muscle and blood with low magnesium, and that substance P stimulated histamine release, which worsens inflammation. In animal models of magnesium deficiency, as the deficiency worsens the animals develop progressive heart damage (cardiac lesions). This is accompanied by a rise in inflammatory cytokine levels both in the heart and within the endothelium the lining of blood vessels).

High levels of substance P are common in human heart disease.

Yet another important study demonstrated that substance P came from the spinal cord ganglion (a bundle of nerve cells) supplying nerves to the heart, and glutamate (an excitatory neurotransmitter) caused it to be released. Once substance P entered the heart muscle and blood, it triggered intense inflammation in the heart and caused a depletion of essential glutathione—one of the cell's most important antioxidant systems.

The study also found that after magnesium had been at low levels for two weeks, one inflammatory marker (PGE2) rose 300 percent higher than normal. Either blocking the glutamate receptors or raising magnesium levels quickly lowered the PGE2 to normal levels.

These results confirm that inflammation of the heart muscle plays a major role in congestive heart failure, and that reducing the inflammation dramatically improves heart function. This may explain why hawthorn is so effective in treating heart failure—because it reduces inflammation and excitotoxicity (immunoexcitotoxicity), a condition in which nerve cells are damaged or killed by excessive stimulation by glutamate due to low levels of magnesium.

Studies have shown that the entire nerve system of the heart is controlled by glutamate-type receptors, and that when these receptors are over-stimulated they can cause the heart to beat abnormally (a condition called an arrhythmia) or possibly even destroy nerves within the heart.

The heart muscle itself contains numerous glutamate receptors. When they are over stimulated, they can lead to congestive heart failure caused by excitotoxicity.

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