

Magnesium vs. Disease and Aging

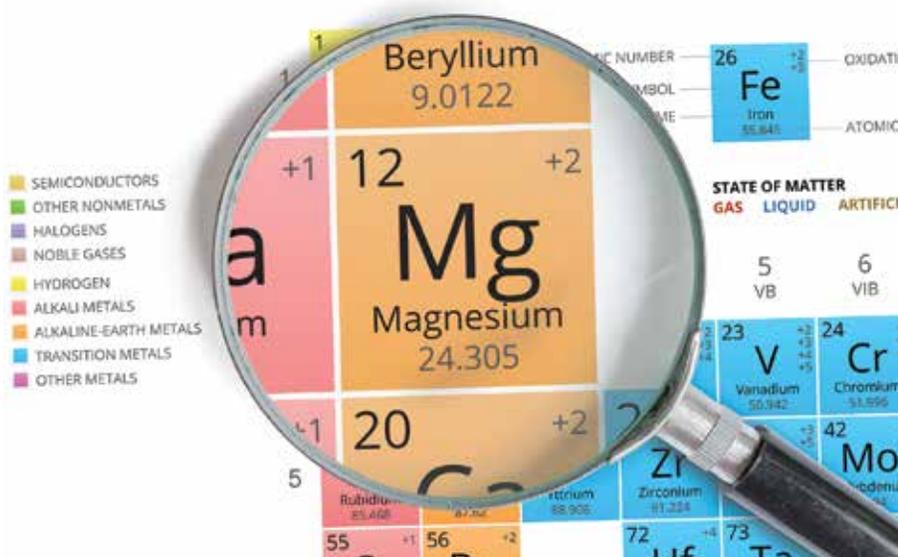
Magnesium is truly one of the most vital minerals for maintaining health and fighting against a wide variety of diseases. In an interview concerning his research on aging, Dr. Bruce Ames of the University of California at Berkley (a leading researcher in the causes of age related cell decay and aging), stated that he found "A lack of magnesium damages cell DNA and accelerates mitochondrial decay that essentially causes cells to age prematurely, lose energy, and become dysfunctional". As we had documented in the September 2015 Albion Research Notes, newer enzymatic databases have listed over 600 enzymes in which magnesium serves as a cofactor and 200 enzymes in which magnesium serves as an activator

(*Nucleic Acid Res.* 28/40, 200/2012). It is due to this high level of involvement that magnesium has an impact in nearly every major metabolic and biochemical process within the cell.

Given this wide range of biochemical and physiological impact and the findings that up to 90% of Americans do not get the recommended intake of magnesium, symptoms of low magnesium have been the subject of much more recent clinical investigation. According to a review by the [University of Maryland Medical Center \(umm.edu\)](http://umm.edu) devoted to the high incidence of low magnesium intake and its medical problems, the following are common signs of low magnesium status:

- Agitation and Anxiety
- Restless Leg Syndrome (RLS)
- Sleep Disorders and Insomnia
- Irritability
- Nausea and vomiting
- Abnormal Heart Rhythm
- Confusion
- Muscle Spasms and Weakness
- Poor Nail Growth
- Seizures

Additional health reviews also include: Intense PMS (premenstrual syndrome), chronic fatigue, hypertension, migraines, weak bones, and hearing problems. As one can see, some of these signs are, in themselves, disease states.



Disease States Associated with Poor Magnesium Intake

Low magnesium intake has been shown to result in more chronic disease and shorter life spans.

The National Institutes of Health (NIH) Office of Dietary Supplements publication, Magnesium Fact Sheet for Health Professionals contains a group of clinical studies, including prospective studies,

that indicate significant chronic diseases associated with low magnesium intake. In one prospective study from the Netherlands (Joosten MM, et al. *Am J Clin Nutr* 2013;97:1299-1306), 7,664 adults (aged 20 to 75 years) who did not have cardiovascular disease, low urinary magnesium excretion levels (a marker for low dietary magnesium intake) were found to be associated with a higher risk of ischemic heart disease over a median follow-up period of 10.5 years.

A systemic review and meta-analysis of prospective studies (Del Gobbo LC, et al. *Am J Clin Nutr* 2013; 98: 160-173) high serum levels of magnesium were significantly associated with a lower risk of cardiovascular disease and higher dietary intakes of magnesium (up to 250mg/day) were associated with a significantly lower rate of ischemic heart disease caused by a decreased blood supply to the heart muscle.

An earlier study (Song Y, et al. *Diabetes Care* 2005 Jun; 28(6) 1438-44) aimed to examine whether, and to what extent, magnesium intake is related to systemic inflammation and metabolic syndrome. The study involved 11,686 women (ages 45 and over) free of cardiovascular disease and cancer and not using postmenopausal hormone replacement. A cross sectional analysis of the data found that, after adjusting for confounding lifestyle and dietary factors, women in the highest

quintile of magnesium intake had a 27% lower incidence of metabolic syndrome compared to those in the lowest quintile of intake. Researchers concluded that magnesium intake is inversely associated with systemic inflammation and the prevalence of metabolic syndrome.

According to the NIH, most investigations of magnesium intake and the risk of type 2 diabetes have been prospective cohort studies. In a meta-analysis (Schulze MB, et al. *Arch Intern Med* 2007; 167:956-965) of 8 prospective cohort studies following 271,869 women and men over a period of 4 to 18 years, the researchers found a significant inverse association between the intake of magnesium from food and the risk of developing type 2 diabetes; the relative risk reduction was 23% when comparing the highest to the lowest magnesium intake.

According to a review article (Sun-Edelstein C, et al. *Expert Rev Neurother* 2009; 9:369-376), magnesium deficiency is implicated in factors that promote headaches including neurotransmitter release and vasoconstriction. People who experience migraine headaches have lower magnesium levels in serum and tissue than those who do not.

In an earlier study (Phaffenrath V, et al. *Cephalgia* 1996;16(6): 436-440), the

researchers evaluated the prophylactic effect of oral magnesium on migraine in 81 patients aged 18-65 with migraine disorder as defined by the International Headache Society (mean attack frequency of 3.6 per month). The researchers divided the patients into two groups. One group received 600mg of oral magnesium per day, divided into two 300mg doses. The other group received placebos. The dosing took place for 12 weeks. In weeks 9-12, the magnesium group had a 41.6% reduction in migraines and the placebo group had a reduction of 15.8% compared to baseline. In addition, the number of days with migraine and the drug consumption for migraine symptoms decreased significantly for the magnesium group.

Up to 68% of Americans have marginal magnesium deficiency is cause for concern

In more recent years, magnesium has become the subject of much more medical interest. Given the amount of bodily functions that require magnesium, this should not be surprising. Low magnesium levels have become known as a major factor in many chronic disorders and annoying symptoms such as: chronic fatigue syndrome, fibromyalgia, asthma, type 2 diabetes, major depression, a variety of cardiac disorders (ischemic heart disease, angina, arrhythmias, hypertension), ADHD, pre-eclampsia, leg cramps in

pregnancy, cystic fibrosis, colon cancer, and more. The finding that up to 68% of Americans have marginal magnesium deficiency is cause for concern and a good reason for medical research to look into this problem more deeply.



To give further support to the concept that magnesium can effectively improve certain chronic diseases in which low magnesium levels have typically been seen - chronic asthma and cystic fibrosis, Gontijo-Amaral investigated the use of Albion's Magnesium Bisglycinate Chelate in asthma (*C. Gontijo-Amaral, et al. European Journal of Clinical Nutrition (2007) 61, 54-60*) and cystic fibrosis (*C. Gontijo-Amaral, et al. AJCN (published ahead of print 5/30, 2012)*). In both studies, disease symptoms in patients receiving supplemental magnesium dramatically improved. The children in the asthma study who received supplemental magnesium had reduced bronchial reactivity and required less use of their asthma medication. The children in the cystic fibrosis study receiving supplemental magnesium suffered from less oxidative stress and showed significant improvement in the functional status of their respiratory musculature.

Many of these chronic diseases are the result of low grade inflammation. Low magnesium intake has been seen as one of the major factors that lead to chronic low grade inflammation, which has come to the forefront with the vastly increased incidence of Metabolic Syndrome.

Aging and Magnesium

There is no question that low magnesium causes one to age faster. Magnesium fights aging in a variety of ways. For one, magnesium fights against premature aging by maintaining adequate levels of dehydroepiandrosterone (DHEA), known as the youth hormone responsible for the adrenal production of testosterone and estrogens. The levels of DHEA peak at age 25 and decreases steadily as we age. As stated earlier, low magnesium also damages cell DNA and accelerates mitochondrial decay that causes cells to age prematurely, lose energy, and become dysfunctional. The damage from low magnesium does this to all cells where magnesium is involved (which is a vast majority of them). As cells from various body parts or organs lose energy and become dysfunctional, the signs and symptoms of aging begin to show.

In Conclusion

As one can see, magnesium is one of the most vital nutrients where silent deficiency can result in a variety of chronic diseases. Low magnesium levels are one of the larger factors behind aging of the human body. Supplementing magnesium is one way to help prevent magnesium deficiency. Even marginal magnesium deficiency (below 70% of the RDA), can lead to chronic low grade inflammation which leads to a variety of unwanted health problems.

Albion manufactures several excellent bioavailable and digestible forms of magnesium. Most forms of magnesium cause laxation. Albion's chelated forms of magnesium are much less likely to cause this problem:

- Magnesium Bisglycinate Chelate
- Magnesium Bisglycinate Chelate Buffered
- Magnesium Bisglycinate Chelate Taste Free
- Magnesium Lysinate Glycinate Chelate
- Magnesium Glycinate Glutamine Chelate

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