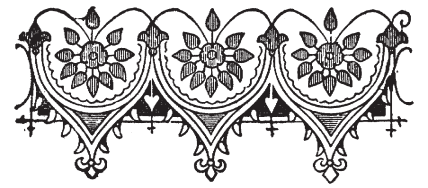


Health & Wellness



Magnesium Deficient? Join the Club.



Dr. Kate Thomsen and Silky

Not sleeping well? Suffer from migraine headaches? Experiencing muscle contractions and cramps? Fatigue? Palpitations? Maybe you are magnesium deficient. You would not be alone.

In 2009, The World Health Organization published a report stating that 75% of Americans consumed less magnesium than they needed. The NHANES dietary survey of 2013 – 2016 showed that 48% of Americans of all ages ingest less magnesium from food and beverages than their respective Estimated Average Requirements. They found the groups most likely to have low intakes are: adult men aged 71 years and older, adolescent males, and females. Why is this?

First the average American diet is disproportionately high in refined grains and these are poor sources of magnesium. Nuts and vegetables which are high in magnesium are less prominent in the American diet. The average American diet continues to evolve toward more fast foods which are not nutrient dense. Processed foods, fat, refined flour, and sugars are all devoid of magnesium.

Secondly, healthy eaters of fruits and vegetables are also at risk of magnesium deficiency due to modern farming practices. While the "Green Revolution" has increased availability of food energy per capita by 35%, it has led to growing nutrient deficiencies in plants and animals. Worsened by global warming and high concentrations of CO₂, there has been a tremendous decline in the micronutrient density of foods. The magnesium content of fruits and vegetables has dropped precipitously in the last fifty years with about 80% of the magnesium lost during food processing. Since 1968, the magnesium content in wheat has dropped 20%.

Thirdly, other nutrients can interfere. Increased calcium and

phosphorous intake increases magnesium requirements so that a high dairy, especially cheese (high calcium, phosphorous) and soft drinks (high phosphoric acid) diet will cause magnesium depletion. High Vitamin D supplementation will increase magnesium requirements and vitamin B6 deficiency will increase magnesium excretion.

Fourth: there is alcohol. While modest consumption of alcohol can double or quadruple the excretion of magnesium from the body, heavy drinking and alcoholism can result in chronically low magnesium levels.

Fifth: health conditions can deplete magnesium levels. These include gastrointestinal conditions such as Crohn's disease and celiac disease. Type 2 diabetes can cause the kidneys to excrete too much magnesium, and in turn lead to a magnesium deficit.

Sixth: there can be interactions with medications. Diuretics (water pills), the heart drug digoxin, proton pump inhibitors (stomach acid blockers) and penicillamine (used for rheumatoid arthritis) can all interfere with magnesium in the body.

Seventh: we age. Older adults have both less efficient absorption of magnesium from the gut and less ability to retain magnesium at the level of the kidneys and are at risk of low magnesium status.

Worse yet, we may be underestimating our needs. Studies of Paleolithic nutrition have found that the usual diet of these hunter-gatherer ancestors of ours contained about 600mg magnesium/day, much higher than our intake today. It is argued that while the lifestyle of modern man has changed, the physiology has not and that nutritional requirements across human populations remain universal. This adds further evidence of our magnesium inadequacy. Today, the USDA recommended dietary allowance (RDA) for magnesium is between 300 and 420mg/day for most modern humans. This is designed to prevent frank magnesium deficiency; it is unlikely to provide optimal health and longevity.

The US Department of Agriculture reports that the average magnesium intake in women and men is 228mg/day and 323mg/day, respectively. Clearly we are a nation of magnesium deficient people.

Magnesium is the eighth most

abundant element on the earth's surface and is essential to the life of plants and animals. Magnesium plays a role in more than 300 reactions in the body – more than any other mineral. Magnesium is needed to synthesize DNA and RNA and the antioxidant glutathione. It transports calcium and potassium ions across cells and supports nerve function, muscle contraction, heartbeat, insulin sensitivity, healthy bones, and acts as a sedative. Magnesium is the second most prevalent electrolyte in the human body, found in every organ. About 55 % of the magnesium in the body is located in the bones, 25 % is in muscle, and 19.3 % is in soft tissues. Only about 1% is found in the blood. This is one of the reasons magnesium deficiency goes unnoticed. Blood levels have little correlation with total body magnesium levels. A blood test measuring magnesium inside the red blood cells is more accurate especially if combined with clinical signs of magnesium deficiency. True magnesium deficiency with loss of appetite, nausea, vomiting, fatigue, weakness, muscle cramps, seizures, abnormal heart rhythms and personality changes occurs with chronic alcoholism or certain medication interactions but is uncommon in the typical adult. Chronic low/normal magnesium levels however is common and produces chronic inflammation and oxidative stress reflected in high C-Reactive Protein (C-RP) and Lipid peroxides (TBARS) in a blood test. This inflammation is a common denominator in conditions associated with low grade chronic magnesium deficiency.

Magnesium has been linked to several chronic diseases and research studies show that healthy magnesium intake and/or magnesium supplementation can have beneficial effects lowering blood pressure (minimally) and lowering risk for: coronary artery disease and stroke, type 2 diabetes and insulin resistance, osteoporosis and migraine headache. Magnesium is used to treat pre-eclampsia and eclampsia of pregnancy. There is some data that magnesium can be used to prevent hearing loss, kidney stones, restless leg syndrome and insomnia. Low magnesium status has been linked to anxiety, depression and ADHD. Magnesium can be used in the treatment of PMS, asthma, COPD,

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INTEGRATIVE AND HOLISTIC HEALTH AND WELLNESS

Magnesium Supplementation

- Supplemental magnesium is available over the counter in many forms: amino acid chelates (citrate, ascorbate, orotate, glycinate, malate, taurate, l-threonate) chloride, carbonate, oxide, hydroxide... which vary in absorption, concentration, and bioavailability.
- The standard dose for supplementation is 200-400mg of elemental magnesium. Magnesium should be taken daily, with food.
- The Supplement Facts label on the back of the bottle gives the elemental amount per dose. (One 400mg tablet of magnesium oxide is 61% elemental magnesium so will list as 242mg of magnesium)
- Magnesium glycinate or bisglycinate is one of the most bioavailable forms and has few side effects. Take at bedtime as the glycinate may have an additional sedative effect.
- Magnesium taurate can lower blood pressure, and is cardioprotective due to its antioxidant effects.
- Magnesium malate has shown improvements in mood, blood sugar control, exercise performance, and chronic pain due to the malic acid component.
- Magnesium L-threonate can be used for cognitive enhancement but it contains low elemental magnesium per dose.
- Forms of magnesium that can cause diarrhea include magnesium carbonate, chloride, gluconate, citrate, and oxide. They are not well absorbed and osmotically pull water into the intestines stimulating gastric motility. The effect is dose dependent. The laxative, Phillips' Milk of Magnesia® uses magnesium hydroxide at 500mg elemental calcium per dose.
- Magnesium hydroxide is also used for acid indigestion, heartburn, upset stomach at a lower dose of 55mg of elemental magnesium per tablet (Rolaids).
- The suggested dose for migraine prevention is 300 mg magnesium twice a day, either alone or in combination with medication.
- If there is too much magnesium, the body will only absorb as much as it needs. However, excessive doses may cause gastrointestinal distress and diarrhea.
- Magnesium supplements can interact with several drugs. Taking magnesium too close to a dose of some antibiotics, (ciprofloxacin, moxifloxacin, doxycycline, tetracycline) may interfere with how the body absorbs the medicine. Similarly, magnesium can interfere with some osteoporosis drugs (bisphosphonates) if the doses are taken too close together. Magnesium can also interfere with some thyroid medications. Magnesium can worsen side effects of some blood pressure medications and increase the potency of some diabetes medicines. Check with your doctor or pharmacist and read your medications information.



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multiple sclerosis, fibromyalgia and chronic fatigue syndrome. Magnesium has been claimed to improve athletic performance, altitude sickness, hay fever, Lyme disease, skin infections and muscle cramps.

The Recommended Dietary Allowance (RDA) of a nutrient is the average daily level sufficient to meet the nutrient requirements of 97-98% of healthy individuals. The RDA for magnesium in adults is 400 – 410 for males and 310 – 360 for females (with the higher levels for teens building bones and for pregnancy and lactation). Only 30 – 40% of dietary magnesium consumed is typically absorbed by the body but this is considered in setting the RDA.

Foods with high magnesium content include dark leafy greens (especially kale, chard, and spinach), legumes, tree nuts (almonds, cashews) and peanuts,

seeds (pumpkin and chia), oily fish, beans, lentils, whole grains, avocado, yogurt, bananas, dried fruit, dark chocolate, and molasses. Tap, mineral, and bottled waters can contain from 1 mg/L to more than 120 mg/L of magnesium depending on the source.

Dr. Kate Thomsen's office for holistic health care is located in Pennington, NJ. She is trained in Family Medicine, and Board Certified in Integrative Medicine. She is an Institute for Functional Medicine Certified Practitioner. She has been practicing Functional Medicine for 23 years. For more information see www.drkatethomsen.com or call the office at 609-818-9700.