

Magnesium

What is Magnesium?

Magnesium is a common light-weight metal known mostly for its use in aluminum alloys, incendiary bombs, flares, sparklers and laxatives. You know how important calcium (another common metal) is in your diet. Magnesium is more important.

Why is it Important?

More than 325 enzymes regulating energy production, muscle strength, nerve cell function, healing, immunity, blood sugar control, hormones and DNA require magnesium. Without magnesium any or all of these processes malfunction.

Can I be Deficient in Magnesium?

You bet. Most of us are deficient in magnesium to some degree. If you are diabetic, have heart disease, hypertension or a long list of common, chronic problems, you are magnesium deficient. Conversely, if you are deficient you may develop those problems.

Don't I get enough from food?

At the turn of 1900, a typical American diet provided 500 mg of magnesium per day. Now it provides about 212 milligrams per day, far below the RDA (recommended daily allowance) of 320 to 420 mg per day.

But wait, there's more!

The RDA is calculated on 6mg/kg per day, so 420 is the estimate for a 154 (70 kg) pound male, hardly the current average. A 200 lb. male needs 540 mg per day. And yet, the need can go much higher as explained below. It's no wonder that 80% of Americans do not meet the RDA. Through time, we gradually become more and more magnesium deficient leading to many of the problems we assume are just aging.

What Foods Contain Magnesium?

Magnesium is contained in wheat germ, wheat bran, whole grain oats, millet and barley, buckwheat, mature lima beans, navy beans, kidney beans, green beans, soybeans, black-eyed peas, spinach, Swiss chard, bananas, blackberries, dates, dried figs, mangoes, watermelons, almonds, Brazil nuts, cashews, hazelnuts, shrimp and tuna.

Processed foods ... sugar, white flour products, most things that come in a box or can have lost their magnesium. Paradoxically the phytates in bran and soybeans and the oxalates in spinach and chard can bind with the magnesium to prevent absorption.

Why are we Deficient?

Life evolved in an ocean environment high in magnesium and potassium. Our bodies didn't need to worry about holding onto enough magnesium. Things have changed because ...

- *We don't eat enough magnesium*
 - Industrial farming techniques deplete the soil of magnesium.
 - Modern food processing removes most of the magnesium from the food ... vegetable oils, white flour and sugar are completely devoid of magnesium

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- Cooking, especially boiling, removes magnesium
- Magnesium is not a required on package nutritional labeling.
- ***We don't drink enough magnesium***
 - Water treatment plants remove magnesium to “soften” water.
 - Fluoridation binds the remaining magnesium.
 - Most bottled waters are devoid of magnesium
- ***We absorb less magnesium***
 - These bind with magnesium preventing absorption
 - Phosphoric acid in sodas
 - Phosphates in processed meats
 - Phytic acid in wheat bran and soy products
 - Oxalic acid in greens
 - These block absorption
 - Calcium supplements (yes the ones you have been told to take)
 - Antacids and acid suppressing pills such as Nexium and Prilosec
- ***We excrete too much magnesium in the urine if ...***
 - You eat sugar and salt or drink alcohol, coffee or tea
 - You are diabetic
 - You exercise and/or sweat
 - You are under stress
 - You are frequently exposed to loud noises
 - You take diuretics for your blood pressure

Doesn't the Doctor Test for Magnesium Deficiency?

Most of the time no. Standard metabolic profiles test for potassium, sodium and chloride but not magnesium. When the doctor does order a magnesium blood test, it is a “serum” magnesium, that is, it measures the amount of magnesium in the liquid of the blood, only 0.3% of the magnesium in your body. The other 99.7% is stored inside cells and not measured by this test. The serum magnesium level is a very poor measure of your total body magnesium supply, yet most doctors don't know this. Your body stores can be very deficient yet the serum magnesium level is normal. In other words, only if your magnesium deficiency is very severe will your doctor diagnose it with a blood test.

Think about it. You were advised to take calcium supplements yet no one took a blood test. Magnesium is no different.

Give me more details about what magnesium does

Magnesium is involved in all the following:

- **ATP is the primary energy compound in the body.** Without ATP, no energy, no life. At the heart of the ATP molecule is magnesium, providing the dynamic link that holds it together. No magnesium, no ATP, no energy. It's not hard to realize that deficiency will lead to muscle weakness, decreased athletic performance and fatigue.
- **Magnesium regulates calcium movement into skeletal muscle cells.** When calcium moves into muscle cells, muscles contract. This need to be controlled to prevent too much of a good

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thing. Magnesium is that control. Deficiency will lead to tics, twitches, spasms, cramps, restless legs, muscle tension and pain. It may lead to chronic headaches and backaches.

- **Magnesium regulates calcium movement into smooth muscle cells.** Smooth muscles are those you have no control over such as your bowel muscles, the small muscles around the airways in your lungs or small arteries. Deficiency may lead to abdominal cramps, asthma, hypertension, Raynaud's (spasm of the finger arteries in cold weather), angina, overactive bladder and menstrual cramps.
- **Magnesium regulates calcium movement into heart pacemaker cells.** Too much calcium in these cells can lead to heart rhythm problems, extra beats, atrial fibrillation, palpitations, sudden death in athletes and mitral valve prolapse.
- **Magnesium regulates calcium movement into nerve cells.** If too much calcium gets into the cells, the nerves are too active leading to anxiety, depression, insomnia, irritability, tremors and PMS.
- **Magnesium regulates calcium movement into other tissues** preventing calcium deposits.
- **Magnesium activates Vitamin D and the enzyme that builds bone.** Without magnesium you will get osteoporosis.
- **Magnesium works in the kidneys** to prevent kidney stones.
- **Magnesium is necessary for protein production.**
- **Magnesium is necessary for DNA and RNA production.**
- **Magnesium is necessary for ear cell functioning.** A deficiency can lead to deafness.
- **Magnesium affects arteriosclerosis.** Magnesium controls the enzymes that produce good and bad cholesterol, prevents blood clots and preserves the lining of your arteries.
- **Magnesium affects your blood sugar.** Deficiency leads to insulin resistance and diabetes.

Recap so far

- You are at high risk of magnesium deficiency.
- You become magnesium deficient slowly through time. Sometimes a little, sometimes a lot.
- Deficiency has no single symptom. Your symptoms will be varied, vague, ill-defined and almost always ascribed to some other problem.
- Your doctor won't recognize your deficiency.
- A serum magnesium blood test is worse than useless. It tells you nothing about your magnesium body stores and may falsely lead you to believe you are fine.
- Magnesium is a very safe supplement. The only exceptions are relatively uncommon ... severe kidney disease, a very slow heart rate, myasthenia gravis or a bowel obstruction. That's it. The only significant side effect is loose stools if you take too much as one time.
- Eat foods rich in magnesium.
- Drink mineral water high in magnesium when you can.
- Reduce your consumption of sugar, salt, alcohol, coffee and tea.
- Take a daily magnesium supplement ... more below.
- If you have symptoms, it can take weeks to months to restore your magnesium supplies.

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How Much Should I Take?

Shoot for a total of 600 to 900 milligrams per day including food, liquids and supplements. A good basic supplement is 300 mg once or twice a day, perhaps more if you are very symptomatic. This easily meets the recommended daily intake and provides extra for healing, repair and special needs. Try not to take more than 300 mg at one time, spread your dose throughout the day to minimize loose stools or diarrhea.

Where Can I get Magnesium?

You may find magnesium oxide over-the-counter very easily in any grocery store, drug store or health food store. Go to the latter to find the better forms. Unlike potassium, you do not need a prescription to buy magnesium.

Which form should I take?

Magnesium comes in many different forms. Some of these are:

- Magnesium oxide - Common, cheap, poorly absorbed. Avoid this.
- Magnesium chloride - Found in topical (applied to the skin) preparations.
- Magnesium citrate - Affordable, good all-rounder, prevents kidney stones, constipation
- Magnesium gluconate - Less likely to cause diarrhea
- Magnesium glycinate - Less likely to cause diarrhea
- Magnesium malate - Good for fibromyalgia, a chronic pain syndrome
- Magnesium taurate - Good for heart disease and depression
- Magnesium aspartate - Avoid this
- Magnesium glutamate - Avoid this
- Super Mag - Powdered combination of taurate, gluconate, carbonate and citrate

Isn't Magnesium Citrate what I used before my colonoscopy!

Magnesium citrate can be used for the "bowel prep" prior to a colonoscopy. It's all in the dose. A daily supplement is 300 mg twice a day while a bowel prep uses 12,000 mg!!!

Is Magnesium Expensive?

In general, no. The oxide is the cheapest but also the least effective.

Don't I Get Enough Magnesium in my Multivitamin?

Probably not. A standard Centrum has 50 mg of magnesium oxide while the Advanced Formula has 100 mg. The absorption rate for magnesium oxide is 4% so you are only getting 2 mg in the first and 4 mg in the latter, hardly worth it. The other minerals in Centrum aren't any better. The magnesium absorption rate for food and water is about 50% and the other versions about 30%. Good multivitamins use magnesium citrate or similar.

What are the dangers of Magnesium?

Very few. People with bad kidneys on dialysis should not take magnesium or any other supplement without the express approval of their doctor. Taking too much magnesium at one time can cause loose stools or diarrhea. If you are a diabetic it might lower your blood sugar enough to reduce your medication. Same for hypertension.