

MAGNESIUM

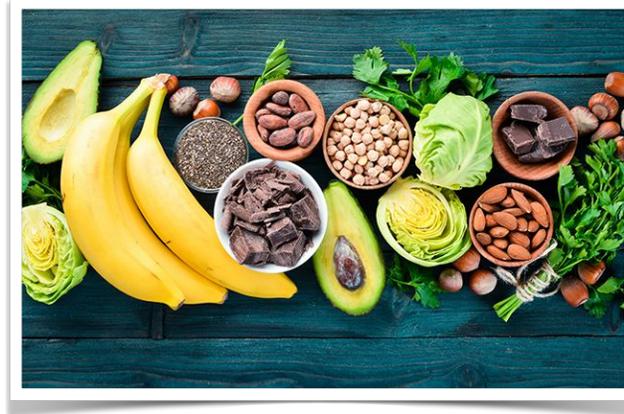
Written by | Dr. James Oliver Jacques DC | Luminous Chiropractic

What is it?

- It is considered a Master Mineral or Essential Element.
- Considered the 3rd most important mineral for the body.
- Has ~700 metabolic functions and counting...
- ~50% stored in bone, ~50% stored in intracellular matrix like muscles and ~1% remaining can be found in the blood.
- ~99% is inside cells making it hard to diagnose Magnesium Deficiency.
- There are NO KNOWN Hormones that regulate Magnesium.

Where do we find it?

- Magnesium is found in the Chlorophyll of plants.
- Leafy greens such as spinach, chard, kale.
- Avocados.
- Wild caught fish.
- Red meats.
 - A large amount of it is stored in muscle cells, meaning meat from other animals does too.
- Hazelnuts, almonds, walnuts, chia seeds and pumpkin seeds.
- Figs.
- Cocoa.
 - General craving of chocolate has been said to mean you are needing Magnesium. Whether that is true is tough to find research in.
- Garlic.
- Kidney beans.



Require Daily Intake

- Recommended Daily Allowance (RDAs) for women is between 310-360mg while men is 400-420mg.
- BUT these guidelines are set to prevent any sort of deficiency and provide the bare minimum of proper body function.
- On average, Americans are getting roughly 200-300mg.
- The ideal range recommended is **~500-800mg**.
- This range depends on an individuals deficiency, intake, ability to absorb and what is consumed that can deplete Magnesium levels.
- Mainly absorbed via the Intestinal Tract.
- Magnesium can also be absorbed through the stomach, either from an ion channel or a bigger channel. The bigger channel allows for higher absorption rate.

Who should NOT be taking Magnesium?

- People experiencing poor kidney function or going through kidney failure. (Ask your MD for more information)
- Those with slow heart rates.
- Those with bowel obstruction.
- High intake of medication. (Ask your MD for approval)

Side Effects of too much Magnesium?

- Fatigue or feeling lethargic.
- Can have a laxative effect or cause diarrhea.



Symptoms of Magnesium Deficiency:

- Muscle cramps, spasm, involuntary twitches or inability to relax.
- Heart Problems/Disease such as atrial fibrillation.
- Irritable bowel Syndrome (IBS), Constipation.
- Fatigue.
- Insomnia.
- Depression.
- Decrease flexibility.
- Stress.
- PMS.
- Sugar Cravings.
- Heartburn.
- Migraine/Headaches.
- High Blood Pressure.
 - Can cause Pre-eclampsia in women.
- Fibromyalgia.
- Myopathy.
 - A muscle pain not from exercise or trauma, just unexplained pain.
- Diabetes.
- Hypothyroid.
 - Magnesium is needed for Thyroid Stimulating Hormone (TSH) creation.
- Osteoporosis.
- Smelly feet.

Main Benefits of Magnesium

- 1) It's a vasodilator.
 - Limited blood circulation in muscles are prone to cramps.
 - Limited blood flow to the brain causes sluggishness or headaches.
- 2) Helps decrease blood pressure.
 - Blood pressure measurements specifically test the strength/constriction of blood vessel walls.
 - The more constriction the higher the blood pressure and vice versa.
 - Strength of blood vessel walls can be increased by their ability to constrict/dilate or depending on the muscle tone surrounding them.
 - If blood vessel walls are unable to dilate/contract due to low Magnesium, muscle tension will increase on the arterial walls and increase blood pressure.
 - Calcium-Blocking Medication for hypertension have been found to be less successful than providing Magnesium supplementation.
- 3) It's an electrolyte.
 - Helps membranes regulate electrical conduction and regulation of neurotransmitters.
 - Without it you can not release Serotonin and Dopamine in the synapses.
- 4) Helps maintain low Sodium levels inside our cells.
- 5) Helps regulate absorption of Potassium.
 - Helps maintain high Potassium levels inside our cells.
 - Helps stimulates the Kidneys to reabsorb Potassium.
- 6) Regulates Calcium in muscles and neurons.
 - Helps open up and control the Calcium released for muscle contraction.
 - Helps prevent neuron excitement/stress from happening by blocking NDMA Receptors from allowing Calcium into nerve cells.
 - Helps maintain low Calcium levels inside our cells.
 - Generally want a 2:1 Ratio of Calcium:Magnesium.
- 7) Helps with DNA Reconstruction.
- 8) Activates Vitamin D.
- 9) Helps prevent kidney stones.
- 10) Regulates production of sex hormones, thyroid hormone, insulin, cortisol and progesterone.
- 11) Regulates energy/ATP production.
- 12) Helps with Methylation (stimulates ComT) which helps with detoxification and activation of many enzymes.



How a Cramp Happens:

- A cramp is a muscle contraction that doesn't let go.
- Magnesium helps reduce Neuromuscular Excitability.

Steps:

1. An action potential from a Neuron will trigger the release of Calcium to the muscle cell.
 2. The Calcium binds to a protein which triggers the muscle to contract.
 3. It takes energy (ATP) to release the Calcium from the protein and take it all back into the muscle storage.
 4. Potassium is required to take Calcium back to muscle storage. Without potassium the muscle will stay tightened up and cramp due to it still being bound to Calcium, hence why intense workouts can cause cramps due to lack of Potassium.
 5. Magnesium helps slow down the amount of Calcium released when a nerve Action Potential happens and thus allows better control of Calcium usage and storage.
- Magnesium is like the speed bump or Gatekeeper that controls the rate of Calcium released to be used for contraction of the muscle. Allowing Potassium to do its job with out being overwhelmed.
 - If you cramp during the night that is a Magnesium issue, due to the Neuromuscular Excitability from not having enough Magnesium during your recovery period.
 - If you cramp during a workout that is usually a Potassium issue and not necessarily a Magnesium issue. If you're deficient enough in Magnesium though, it can be both.

What can deplete Magnesium?

While finding foods and supplementing with Magnesium is vital, it is just as important to know what depletes it.

1) Processed Sugar.

- To break down one molecule of sugar, there are 8 steps to break it and half of those steps require Magnesium which is stolen from your own storage.

2) Chronic prolonged stress and losing sleep.

- The more stressed out you are, the more energy (ATP) your body will create and deplete your Magnesium supply.

3) Alcohol, Coffee and Tea.

- These are Diuretics meaning you will lose Magnesium through kidney excretion/urination.

- The level of kidney function is important. The healthier the kidney the more you retain.

- Also helps in getting rid of excess Magnesium.

- 1 cup of coffee/alcohol a day is fine, but if you drink 3-4 cups or glass a day, expect your body to lose a good amount.

- Coffee is NOT rich in Magnesium as rumors say.

4) Medicine.

- Birth control pills/Estrogen pills, blood pressure pills, Anti-Acids, Seizure meds, etc..

5) Gut Inflammation.

- Magnesium gets absorbed in the small intestines. If your gut is inflamed it can't be absorbed as efficiently as it should.

6) Sweating.

- Magnesium and Potassium both get depleted through sweat.

- Different workouts can deplete one more than the other.

7) Excess Calcium.

8) Low stomach acids can cause lack of absorption.

9) Phosphoric Acid in sodas.

10) Too much salt.

11) Diabetes.

- Insulin resistance prevents absorption of Magnesium. Plus the increased sugar in the blood system further depletes the Magnesium.



Types of Magnesiums:

Magnesium Glycinate: (Quality Level: GREAT!)

- Bound to the amino acid Glycine which is a precursor of the neurotransmitter GABA that helps you relax.
- It is a Chelated form of Magnesium meaning a more wholesome bioactive form that gets absorbed really well.
- Gentle on the stomach and less likely to cause diarrhea/laxative effect unless you take too much.
- Also helps with producing the neurotransmitter Serotonin.
- Helps increase blood flow into extremities.
- Supports blood sugar levels.
- Good for headaches.
- Is Anti-Inflammatory

Magnesium Threonate: (Quality Level: GREAT!)

- Better access through your blood/brain barrier.
- Helps neurons shorten the gap between them for better function and sensitivity of the synapses.
- Positively affects your short and long term memory
- Has shown benefits in depression & anxiety.
- A Chelated form that helps with sleep. Can make you sleepy or groggy so it's better to take before bed.
- Generally expensive to buy.

Magnesium Taurate: (Quality Level: GREAT!)

- Helps with muscle pain.
- Bound to Taurine which helps with clearing out waste in muscle cells.
- Being low on Taurine can cause an over stimulated Nervous System.
- Good for Heart Disease and depression.

Magnesium Chloride: (Quality Level: GOOD)

- A Chelated form that has an extra Chloride molecule which helps with gastric juice production in your stomach.
- Good for metabolic function and detoxing.
- Usually found as a topical/lotion.
- Has 12% absorption rate.
- No diarrhea effects.

Magnesium Malate: (Quality Level: GREAT!)

- The body is able to produce its own Magnesium Malate.
- Known to be energizing.
- It aids in ATP production.
- Chelated form as well.
- Helps for those who work out a lot.
- Good for fibromyalgia.
- No laxative effect.
- Helps with fatigue

Magnesium Citrate: (Quality Level: GOOD!)

- Helps with constipation and inducing bowel movements, due to its focus on smooth muscles.
- Not good at systemic absorption of magnesium for general relaxation and other functions.
- It interferes Ceruloplasmin which means it stops iron transportation.
- Prevents kidney stones.

Magnesium Sulfate: (Quality Level: GOOD)

- Epsom Salt bath type.
- No real studies that have been conclusive to show its benefits in recovery and relaxation.
- It does help as a laxative.
- Also used in IVs.

Types of Magnesiums: (Continued)

Magnesium Orotate: (Quality Level: GREAT!)

- Good for circulation, muscles and heart health.
- Goes deeper into cells.
- Great for athletes.
- Expensive.

Magnesium Oxide: (Quality Level: POOR)

- Seen Everywhere.
- Mostly just Oxide and not enough Magnesium.
- It's basically burned with pure oxygen.
- Bound to a fatty acid.
- 4% Absorption Rate.
- Throw away.

Magnesium Glutamate & Aspartate: (Quality Level: POOR)

- They are both bound to excitotoxins which end up stressing your body and wasting Magnesium.
- Throw away.

Magnesium Supplement Dr. James Oliver Jacques Recommended:



Magtech has 3 of the TOP Magnesiums highlighted above:
Magnesium Threonate
Magnesium Glycinate
Magnesium Taurate

* All information given on this article was based off of +10hrs of video and article research. Quality levels scale are purely opinion based on information collected and what Dr. James Jacques has experienced personally and from patient feedback.