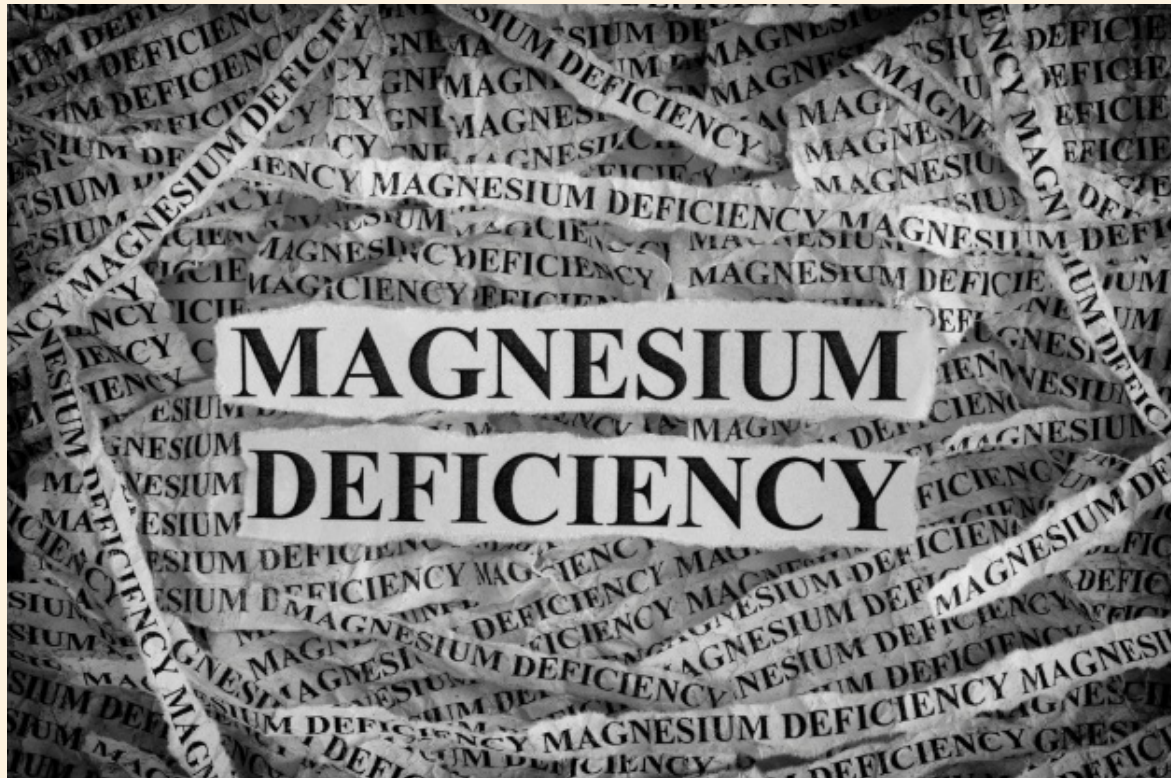


Volume 8, Issue 2

January 9, 2022



Part 2 of 4 Additional Information About Magnesium

We frequently receive requests for dietary suggestions from individuals who list some or all of the following symptoms, despite the fact that they have been strictly following a diet that should be safe.

- muscle pain or muscle spasms
- leg or foot cramps
- joint or lower back pain
- nausea
- difficulty sleeping
- hypertension
- headaches
- brain fog
- anxiety
- panic attacks
- depression
- constipation
- fatigue or weakness
- always thirsty
- frequent and/or urgent urination

Of course, there are other issues that can cause some or possibly even most of these symptoms. Fatigue and brain fog, for example, may be lingering symptoms of MC. These MC symptoms can take up to 2 years to resolve, in some cases. But all of the symptoms listed above (and more) can be caused by a chronic magnesium deficiency. And the fact that IBD's deplete magnesium, emphasizes the significance of symptoms in this group. Consider, for example, muscle spasms, joint pain, lower back pain, and similar issues. These occur because



magnesium is necessary to relax muscles, and a magnesium deficiency causes them to tense up, or spasm, causing cramps and pain.

Nausea can also be caused by a magnesium deficiency. Although you won't find this explanation for nausea by Googling either magnesium deficiency or nausea, a primary pathway by which this can happen, is caused by tenseness or spasms of the pyloric sphincter. This sphincter, between the stomach and small intestine, regulates the flow of gastric juices and partially digested food (chyme) from the stomach into the small intestine. A magnesium deficiency can cause that sphincter to tighten or spasm, which can cause chyme that is ready to be released into the duodenum, to instead be retained in the stomach, causing a condition known as gastroparesis. This causes a feeling of fullness, and often nausea. Interestingly, diabetes patients often suffer from gastroparesis.

Even more interesting, is the fact that magnesium deficiency is closely associated with diabetes. In fact, the last 2 items on this list are prediabetes symptoms that are attributed by medical research, to a chronic magnesium deficiency. Published medical research shows that in such cases, restoring magnesium levels to normal can often prevent the development of diabetes.



The relaxing effect of magnesium also helps to prevent sleeping difficulties. Gamma-aminobutyric acid (GABA) is an amino acid, and it's probably the main neurotransmitter in the brain that's able to slow down or block certain nerve signals that exacerbate anxiety or mental stress. While a magnesium

deficiency causes increased feelings of stress, and anxiety, taking a magnesium supplement increases GABA, which helps us to relax, get to sleep, and stay asleep.

Studies show that magnesium lowers blood pressure by increasing the production of nitric acid, which helps to relax blood vessels, allowing them to expand, which increases the arterial volume, thereby reducing the pressure. Symptoms such as hypertension, headaches, and even cardiac issues, can occur when magnesium is deficient. Note that published medical research shows that not only do IBDs reduce available nitric oxide, but a reduction in nitric oxide is associated with initiating and maintaining inflammation.

Magnesium deficiency decreases cognizance and the ability to concentrate, which is usually interpreted as brain fog. Medical research has associated it with anxiety, depression, and even panic attacks. In the brain, the N-methyl D-aspartate (NMDA) receptors are ligand-gated cation channels that are activated by glutamate. Magnesium ions block



the ion channel of those receptors, to prevent excessive activation, thereby helping to prevent panic attacks, anxiety, and depression.

Magnesium helps to reduce constipation by drawing water into the intestines. This increases motility and stool volume, thereby prompting more normal bowel movements.

Medical research suggests that the fatigue or weakness caused by magnesium deficiency is due to an associated loss of potassium in muscle cells. Note, however, that this does not necessarily imply a potassium deficiency. The issue is due to magnesium deficiency, and the cellular potassium deficiency is often a side effect of the magnesium deficiency.

As noted above, the symptoms of excessive thirst, and frequent, urgent urination, are prediabetes symptoms, that definitely should not be ignored. The window of opportunity that allows the use of magnesium to prevent the development of diabetes is unpredictable, and it may close at any time, if the problem is not promptly and properly addressed.

Note that taking too much magnesium at one time is pointless, because we can only absorb so much during any given time span. The rest of it will stay in the intestines where it sometimes acts as a laxative, and whether it does or not, it all goes down the toilet. The proper way to use oral magnesium is to divide up the daily dose and take one third of it with or after each of 3 meals, or adjust this dosing schedule to fit however many meals, or snacks, you eat each day.

Although the serum magnesium test that most doctors have traditionally ordered, may be fine for an emergency department setting, it's almost totally worthless for determining magnesium reserves, because serum magnesium is carefully regulated by the body within the normal range. Consequently, the results you receive will virtually always show that your magnesium level is normal, despite the fact that your muscle and bone cells may contain insufficient reserves. Therefore, if you ask your doctor to order a magnesium test to check your magnesium level, request a red blood cell (RBC) magnesium test. This test will provide much more useful results because it measures magnesium reserves in the red blood cells.



TYPE OF MAGNESIUM
Magnesium chloride
Magnesium sulfate
Magnesium citrate
Magnesium oxide
Magnesium glycinate
Magnesium orotate
Magnesium L-threonate
Magnesium malate

Many forms of oral magnesium supplements are available. Rather than to discuss the details of all the different forms on the market, please note that most MC patients seem to have the best results using magnesium glycinate (chelated magnesium). Magnesium glycinate is easily absorbed, and it's probably the least likely form to cause diarrhea

for most patients.

How much magnesium glycinate should you take? While this requirement surely varies by the individual, most of us seem to do well by basing our dose on the RDA, and adjusting it up or down from there. The RDA is roughly 400 mg for men and 300 mg for women. Many MC patients need a significantly larger dose early on in their recovery. But taking a larger amount (or even any amount, for some MC patients) while still trying to reach remission, can cause diarrhea for some patients, although this isn't a problem for others.

If you are one for whom oral magnesium causes problems, a better option might be to use a magnesium lotion or oil on your skin frequently during the day, or soak your feet in a container of water in which Epsom salts have been dissolved, or add about a cup of Epsom salts to your bathwater and soak in it for 15 or 20 minutes.



Too much magnesium can be toxic. Note that an excessive magnesium level (hypermagnesemia) can be toxic, and interestingly, an excessive magnesium level tends to cause basically the same symptoms as a magnesium deficiency. Typically, this issue occurs in individuals who have compromised kidney function. For anyone whose kidneys are working normally, any excess magnesium is promptly flushed from the body. But if kidney function is compromised, the level can build up, and reach a toxic level. So if you suspect, or know that you have reduced kidney function, please check with your doctor before starting to take magnesium, or making any changes in your magnesium dose.

Many medications deplete magnesium. While a few foods, such as coffee, and certain antioxidants, such as phytates and phytic acid, may tend to deplete magnesium, the biggest problem, by far, in this category is medications. Many medications deplete magnesium, including corticosteroids, certain antibiotics, antacids, contraceptives, cardiovascular medications. diuretics, proton pump inhibitors (PPIs), and possibly others. Rather than discuss all the details of each of these medications, suffice to say that if you're taking one or more of them, you may soon be magnesium deficient, if you're not already (deficient). If you're using any of them, you almost surely need to be taking a magnesium supplement, but definitely do not take them at the same time. Take the magnesium either 2 hours after you take the medication, or 4 to 6 hours before you take the medication. Many of the medications that deplete magnesium, are also depleted by magnesium, so in the case of certain antibiotics, this is especially important, because taking them too close together will deplete the magnesium, while causing the antibiotic to lose some or all of its efficacy.



The antibiotic Ciprofloxacin (Cipro) is a good example here. Despite the fact that it is the only antibiotic that can be used by MC patients, without a risk of causing diarrhea, its use has fallen out of favor among doctors because it contains so many dire black box warnings on the label. Consequently, many doctors will not prescribe it. Yet epidemiological evidence shows that all of the debilitating side effects listed on the label, are due to patients taking Cipro while having a magnesium deficiency. Not only does Cipro severely deplete magnesium, but magnesium severity compromises the efficacy of Cipro.