

Magnesium Glycinate: What the evidence shows.

A plain-language look at one of the most studied minerals in medicine, how the body uses it, why the form on the label matters, and what the published research does and does not support.

About this guide. Magnesium glycinate is the shared base of all three MGB+ formulas: *Clear*, *Cool*, and *Calm*. It is elemental magnesium bound to the amino acid glycine, a pairing chosen for gentler absorption and less stomach upset than the cheaper forms like magnesium oxide and magnesium citrate. This handout covers the published evidence on magnesium itself, and on the glycinate form specifically, so you can read it yourself and decide what makes sense for you.

What is magnesium glycinate?

Magnesium is an essential mineral, which means your body cannot make it and has to get it from food or supplements. It is one of the most abundant minerals in the human body, and it is involved in more chemistry than almost any other.^{1,2}

Magnesium sits in the background of an enormous amount of everyday biology. It is a required helper, called a cofactor, in more than 300 separate enzyme reactions. Those reactions include making energy from food, building proteins and DNA, moving other minerals like calcium and potassium across cell membranes, and steadying the electrical signals that run nerves and muscles.^{1,2,3} When magnesium is low, a wide range of small things in the body run less smoothly at once. That is why the symptoms of low magnesium are vague and scattered rather than pointing to one organ.^{3,4}

Why the form on the label matters

Magnesium never exists by itself in a bottle. It is always paired with something else, and that something else changes how much actually gets absorbed and how the supplement feels in your stomach. The paired compound is called a salt or a chelate. The two words you will see most often on labels are oxide and glycinate, and they behave very differently.^{5,6}

Magnesium oxide is the cheapest and most common form. It packs a lot of elemental magnesium by weight, but the body absorbs only a small fraction of it. The magnesium that is not absorbed stays in the gut, pulls water in behind it, and acts as a laxative. That is exactly why magnesium oxide and the related milk of magnesia are sold as constipation remedies. It is a fine choice when a laxative effect is the goal, and a poor choice when it is not.^{5,6,7}

Magnesium glycinate, also written as magnesium bisglycinate, is magnesium bound to two molecules of the amino acid glycine. Amino acids are the building blocks of protein, and the gut has dedicated, efficient pathways for absorbing them. Bound to glycine, magnesium tends to be better tolerated and is generally chosen specifically to minimize the loose-stool and cramping effect that oxide and citrate can cause.^{5,6,8} The tradeoff is that glycinate carries less elemental magnesium per milligram of total compound, so the label has to account for that, a point covered in the dose chapter.

Glycine is not just a carrier

The glycine half of the molecule is not dead weight. Glycine is itself an amino acid that the nervous system uses as a calming, or inhibitory, neurotransmitter. It has been studied on its own for its effect on sleep onset and subjective sleep quality.⁹ So the glycinate form pairs magnesium, which supports normal nerve and muscle function, with a carrier molecule that has its own quiet biology. This is part of why glycinate is a common choice in formulas aimed at calm and rest rather than at moving the bowels.

How common is low magnesium

Outright magnesium deficiency severe enough to show up on a standard blood test is uncommon in healthy people, because the body works hard to keep blood levels steady by pulling magnesium out of bone. But that stability on a blood test can hide a quieter problem. Dietary surveys in the United States consistently find that a large share of adults take in less magnesium than the recommended amount from food, a state some researchers

call subclinical or chronic latent magnesium deficiency.^{3,4,10} A normal blood level does not rule it out, because less than one percent of the body's magnesium is in the blood at any moment.^{1,3}

THE SHORT VERSION

Magnesium is an essential mineral and a required helper in more than 300 enzyme reactions, especially those that run nerves and muscles. The form on the label matters: oxide is poorly absorbed and acts as a laxative, while glycinate, magnesium bound to the amino acid glycine, is chosen for gentler absorption and less stomach upset. Glycine itself is a calming neurotransmitter.

CHAPTER TWO

How it works in your body

Magnesium is a quiet regulator. It does not drive any one system hard. Instead it sets the baseline tone for nerves, muscles, and the stress response, which is exactly why it shows up in conversations about both the gut and the brain.

It steadies nerve and muscle signaling

Nerves and muscles run on a flow of charged minerals, mainly calcium, potassium, sodium, and magnesium, moving in and out of cells. Calcium is the accelerator that triggers a nerve to fire or a muscle to contract. Magnesium acts as a natural counterweight, sitting at the same channels and keeping calcium from flooding in too easily.^{1,2} In plain terms, calcium turns things on and magnesium helps turn them back off. When magnesium is low, nerves fire more readily and muscles are quicker to twitch or cramp, because the brake is weaker.^{1,2,3}

It modulates the NMDA receptor

One specific place this counterweight matters is a receptor in the brain and nervous system called the NMDA receptor. It is one of the main switches for the excitatory signaling that underlies learning, pain transmission, and general nervous-system arousal. Magnesium physically sits in the mouth of this receptor channel and blocks it until a strong enough signal arrives to push the magnesium out.^{1,2} This is one of the cleanest mechanistic reasons magnesium is connected to nervous-system tone. When magnesium is plentiful, the NMDA channel is harder to over-activate. This is a documented mechanism, not a claim that magnesium treats any condition.

The gut-brain and stress connection

The gut and the brain talk to each other constantly through the nervous system and a shared set of stress hormones, a network often called the gut-brain axis. Magnesium has a foot in several parts of it.^{11,12}

Magnesium plays a role in the body's central stress system, the HPA axis, which is the chain of signals running from the brain down to the adrenal glands that releases cortisol, the main stress hormone. Animal and human work links low magnesium with a more reactive stress response and higher cortisol output, and links adequate magnesium with a more settled one.^{11,12} The relationship runs both ways: stress itself causes the body to lose magnesium in the urine, which can set up a loop where stress lowers magnesium and lower magnesium makes the stress response more reactive.¹²

The vagus nerve, the long nerve that carries calming signals between the brainstem and the gut, sits inside this same picture. Because magnesium steadies nerve signaling broadly, it is part of the background chemistry that

keeps this calming arm of the nervous system working normally.¹¹ The honest framing is that magnesium supports the normal function of these systems. It does not override them.

Smooth muscle and gut motility

The gut wall is lined with smooth muscle that contracts in waves to move food along, a process called motility. Smooth muscle, like all muscle, relies on the calcium-magnesium balance described above, and magnesium has a relaxing effect on it.^{1,2} This smooth-muscle relaxation is one reason magnesium is connected to digestive comfort. It is also, in the poorly absorbed oxide and citrate forms, part of how magnesium produces a laxative effect: unabsorbed magnesium draws water into the bowel through simple osmosis, separate from any relaxing action.^{5,7} The glycinate form is chosen specifically because it is well absorbed and so produces much less of that osmotic pull.

WHY THIS MATTERS ACROSS CLEAR, COOL, AND CALM

Magnesium glycinate is the shared base of all three MGB+ formulas because its mechanism is foundational rather than narrow. Steadying nerve and muscle signaling, modulating the NMDA receptor, supporting a settled stress response, and relaxing gut smooth muscle are background functions that sit underneath whatever each formula is built around. Glycinate is the form chosen so that this support comes without the laxative effect of cheaper magnesium salts.

CHAPTER THREE

What the studies show

Magnesium is one of the most studied minerals in medicine, but the strength of the evidence varies a lot by topic. Some areas rest on solid physiology and decent trials. Others rest on small or mixed studies that the authors themselves call low quality. Here is an honest breakdown, area by area.

Magnesium status and deficiency

STRONG EVIDENCE · POPULATION DATA · WELL CHARACTERIZED

The physiology of magnesium and the consequences of running low are well established. A 2015 review by de Baaij, Hoenderop, and Bindels in *Physiological Reviews* is a standard reference on how the body handles magnesium and what goes wrong when it is depleted.¹ Multiple analyses, including a 2018 review by DiNicolantonio, O'Keefe, and Wilson in *Open Heart* and a 2017 review by Schwalfenberg and Genuis in *Scientifica*, document that a meaningful share of the population takes in less magnesium than recommended, and argue that a normal blood test can miss this.^{3,4}

What this means: this is the most solid part of the magnesium story. Magnesium is genuinely essential, low intake is genuinely common, and the case for getting enough is not in dispute. This is structure-function territory, not a disease claim.

Constipation and motility

ESTABLISHED EFFECT · MOSTLY OXIDE AND CITRATE

Magnesium's laxative effect is real and long established, but it belongs almost entirely to the poorly absorbed forms. Oxide and citrate leave unabsorbed magnesium in the bowel, which pulls in water by osmosis and loosens stool.^{5,7} This is a property of those forms, not a general feature of all magnesium.

What this means, and an honest distinction: magnesium glycinate is chosen specifically to *minimize* this effect, not to produce it. It is well absorbed, so very little is left in the bowel to draw water. If your goal is a laxative, glycinate is the wrong magnesium. The glycinate in MGB+ is there for the nerve, muscle, and stress-tone biology, with gentle gut tolerability, not for an osmotic push.

Sleep quality

SOME RCTS · MODEST AND MIXED

A 2012 randomized controlled trial by Abbasi and colleagues in the *Journal of Research in Medical Sciences* gave 500 mg of magnesium daily to older adults with insomnia and reported improvements in subjective sleep measures and in some sleep-related blood markers compared with placebo.¹³ A 2022 systematic review by Mah and Pitre in *BMC Complementary Medicine and Therapies* pooled the available randomized trials and found that the evidence for magnesium and sleep is of low quality, with small studies and inconsistent results.¹⁴ The glycine carrier in glycinate has separately been studied for sleep onset.⁹

What this means: there is a real signal worth knowing about, but it is modest and the trials are small. Magnesium supports normal sleep biology. It is not a sleep medication and the studies do not support calling it one.

Anxiety and stress

SYSTEMATIC REVIEW · MODEST EFFECT · LOW-QUALITY EVIDENCE

The most cited synthesis here is a 2017 systematic review by Boyle, Lawton, and Dye in *Nutrients*, which looked at magnesium supplementation and subjective measures of anxiety and stress. The authors found suggestive evidence of a modest effect, but were explicit that the existing trials are of low quality and that better controlled studies are needed before firm conclusions can be drawn.¹⁵

What this means: the honest reading is a possible, modest benefit on self-reported stress, sitting on a weak evidence base that the reviewers themselves flag. Magnesium supports a normal, settled stress response. The published evidence does not support a claim that it treats anxiety.

Migraine

GUIDELINE-SUPPORTED · STRONGEST DISEASE-AREA EVIDENCE

This is the area where magnesium has the most formal clinical standing. A 2018 review by von Luckner and Riederer in *Headache* summarizes the evidence for magnesium in migraine prevention, and the American Headache Society and the Canadian Headache Society have graded oral magnesium as having Level B evidence, meaning it is probably effective, for migraine prevention.^{16,17}

What this means: among all the topics in this chapter, migraine prevention is where magnesium has actual guideline support. That said, MGB+ is a daily-support supplement and is not a migraine treatment. Anyone with migraine should work with the physician managing it; the guideline standing is included here because it is part of an honest picture of the magnesium evidence.

Muscle cramps

MIXED EVIDENCE · MECHANISM PLAUSIBLE

The mechanism is sensible: magnesium steadies the calcium-magnesium balance that nerves and muscles depend on, so the idea that it would ease cramps is biologically reasonable. The trials, however, are mixed. Reviews of magnesium for skeletal muscle cramps, including in older adults and in pregnancy, have generally found little consistent benefit, while leaving open that specific groups might respond.^{2,4}

What this means: the cramp evidence does not match the strength of the mechanism. This is a case where the biology is cleaner than the trial data, and the honest answer is that results are mixed.

The honest summary

WHERE MAGNESIUM SITS IN THE EVIDENCE HIERARCHY

Magnesium earns the label of one of the most studied minerals in medicine. But that phrase deserves a caveat, and so does the relationship between the broad magnesium literature and this specific product.^{1,3,4}

Most of the strongest magnesium trial evidence is not gut-brain specific. The migraine guideline standing, the deficiency physiology, the cardiovascular and metabolic literature: these are the firmest parts, and they sit outside the gut-brain story. The sleep and anxiety areas, which are closer to why people reach for a calming magnesium, rest on smaller and lower-quality trials. On top of that, the great majority of magnesium randomized trials used whichever form the researchers picked, often oxide, citrate, or unspecified, at a wide range of doses. Glycinate-specific randomized trials are far fewer than total-magnesium trials. The glycinate form is chosen here for absorption and tolerability, which is well supported, but the disease-area trial data largely come from other forms.^{5,6,8}

READ THIS BEFORE THE MARKETING

When magnesium is called one of the most studied minerals in medicine, that is true of magnesium broadly, not of any single product, form, or dose. The trials vary widely in which magnesium salt they used and how much. Glycinate, the form in MGB+, has strong support for being well absorbed and gentle, but fewer head-to-head clinical trials than the cheaper forms. Anyone reading this brief deserves to know that the words "most studied" are doing some quiet generalizing.

CHAPTER FOUR

About dose and timing

Magnesium is dosed by its elemental content, the actual amount of magnesium metal in the compound, not by the weight of the whole salt. This is the single most confusing thing on a magnesium label, and it is why two products with the same number can deliver very different amounts.

The RDA and where supplements fit

The recommended dietary allowance for magnesium, set by the Institute of Medicine, is roughly 310 to 320 mg per day for adult women and 400 to 420 mg per day for adult men, counting both food and supplements.^{1,18} Most people are meant to get the bulk of that from food: leafy greens, nuts, seeds, beans, and whole grains are the richest sources. A supplement is meant to fill a gap, not to replace a diet.^{3,4}

The amount of supplemental magnesium used in studies varies widely, commonly in the range of about 200 to 400 mg of elemental magnesium per day, taken on top of food.^{13,15,16} There is a separate, lower safety ceiling for supplemental magnesium specifically, discussed below, because supplements behave differently in the gut than magnesium from food.

Why glycinate is dosed by elemental magnesium

WHAT THE LABEL SAYS	WHAT IT ACTUALLY MEANS	WHY IT MATTERS
Magnesium glycinate, total compound weight	The weight of magnesium plus its two glycine molecules combined. Only a fraction of that weight is elemental magnesium. ^{5,6}	A large number here can still be a modest amount of actual magnesium.
Elemental magnesium	The amount of actual magnesium delivered. This is the number that should be compared to the RDA and to study doses. ^{1,18}	This is the honest number, and the one to read.
Magnesium oxide equivalent	Oxide carries more elemental magnesium per milligram but is poorly absorbed, so a big elemental number does not mean a big absorbed dose. ^{5,7}	Elemental content and absorbed content are not the same thing.

How to read that table

The practical takeaway is to look for the elemental magnesium figure on any magnesium product and compare like with like. Glycinate's advantage is not that it packs the most magnesium per pill, it is that more of what it does carry is actually absorbed and that it is gentle on the gut.^{5,6,8} A well-formulated glycinate aims for a sensible daily elemental amount that supports normal nerve and muscle function alongside food, not a megadose.

Timing

Magnesium does not have to be timed tightly. It can be taken with or without food, though taking it with a meal can further reduce any chance of stomach upset.⁵ Because magnesium supports a settled nervous-system tone and the glycine carrier has been studied around sleep, an evening dose is a reasonable and common choice, but it is a preference, not a requirement.^{9,13} As with most foundation minerals, the realistic window for noticing a change in background symptoms is steady daily intake over several weeks, not a single dose.

Who should be cautious

The most important caution is kidney function. The kidneys are responsible for clearing excess magnesium from the body. In people with reduced kidney function or kidney disease, magnesium can build up to unsafe levels, so supplemental magnesium should only be taken under the direction of the physician managing the kidney condition.^{1,18} Magnesium can also bind certain medications in the gut and reduce their absorption, including some antibiotics in the tetracycline and fluoroquinolone families and the bone drug class called bisphosphonates, so those are generally spaced a few hours apart from a magnesium dose.¹⁸ Anyone on prescription medication should run a new supplement past their physician or pharmacist first.

THE HONEST DOSE FRAMING

Magnesium glycinate is dosed by elemental magnesium, taken alongside a magnesium-containing diet, with the goal of supporting normal nerve and muscle function rather than hitting a therapeutic target for any disease. The form is chosen for absorption and gut comfort. People with kidney disease should not take supplemental magnesium without their physician's direction, because the kidneys are what clear it.

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