Magnesium

Mg — sold as bisglycinate (glycinate), citrate, malate, chloride, taurate, L-threonate and oxide

Magnesium has a genuine population-level rationale — roughly 48 percent of Americans take in less than the estimated average requirement from food — and measured effects that run consistently smaller than its marketing. The largest 2026 synthesis, 78 randomized trials, found statistically significant but modest shifts in blood pressure, glucose and lipids, concentrated in people who are hypertensive or already depleted. Sleep evidence is weak, leg-cramp evidence is effectively negative, and laboratory testing has found that most retail “glycinate” products are not chemically what the label implies.

SUMMARY TABLE

Attribute	Summary
Primary uses	Correcting low intake; lowering blood pressure in hypertension or hypomagnesemia; modest glycemic and lipid improvement; migraine prophylaxis.
Evidence strength	Moderate for blood pressure in hypertensive or depleted adults and for cardiometabolic markers (78 RCTs, 2026). Low for migraine and mood. Low to very low for sleep. Negative for idiopathic leg cramps.
Effective dose	200–400 mg/day elemental magnesium; trial median 365 mg for 12 weeks. Migraine trials used 600 mg/day trimagnesium dicitrate. Dose on elemental, not compound, weight.
How to take	With food; split doses above 200 mg. Separate from bisphosphonates by 2 hours, and from tetracycline or quinolone antibiotics by 2 hours before or 4–6 hours after.
Time to effect	Blood-pressure and glycemic change needs 8–12 weeks. Bowel effects are immediate. Subjective sleep effects, where reported, do not replicate.
Serious risks	Hypermagnesemia in impaired kidney function — the one hard contraindication. Otherwise dose-limiting diarrhea. The 350 mg/day supplemental UL rests on diarrhea alone and was challenged in 2023.
Who should avoid it	Chronic kidney disease or reduced eGFR without physician supervision; heart block; myasthenia gravis.
Quality markers	Elemental magnesium stated separately from compound weight; “fully reacted” rather than “buffered” bisglycinate; third-party ICP-OES testing; USP or NSF certification.

WHAT THE POOLED TRIAL DATA SHOW

A dose-response meta-analysis in *Nutrients* (July 2026) pooled 78 randomized trials. Magnesium lowered systolic blood pressure by 2.50 mm Hg (95% CI −4.08 to −0.91), fasting glucose by 3.60 mg/dL, HbA1c by 0.15 percent, HOMA-IR by 0.48, LDL by 3.21 mg/dL and interleukin-6 by 1.10 pg/mL. Nearly 80 percent of trials used 300 mg/day or more for at least 12 weeks. The authors' own verdict is the honest one: modest effects of uncertain clinical relevance.

A November 2025 meta-analysis in *Hypertension* (38 trials, 2,709 participants, median 365 mg over 12 weeks) sharpens the point. Overall reduction was 2.81/2.05 mm Hg, but hypertensive participants already on medication saw systolic reductions of 7.68 mm Hg and those with hypomagnesemia 5.97 mm Hg, while normotensive groups reached no significance at all. This is repletion of a deficit, not a drug effect.

SLEEP, MIGRAINE, MOOD AND CRAMPS

The two claims that sell the most magnesium are the two the evidence supports least. A systematic review in the *Journal of Dietary Supplements* (August 2026) covering twelve sleep and insomnia trials found results inconsistent across subjective scales, EEG, actigraphy and wearables, rated certainty low to very low, and concluded that the evidence does not support magnesium as a routine insomnia treatment. For cramps the finding is firmer and worse: the 2020 Cochrane review (11 trials, 735 participants) found 0.18 fewer cramps per week in older adults (95% CI −0.84 to 0.49) and no difference in the share achieving a 25 percent reduction.

Migraine and mood are more form-specific. A 2026 review in the *Egyptian Journal of Neurology, Psychiatry and Neurosurgery* (6 trials, 502 participants) found trimagnesium dicitrate at 600 mg/day cut attack frequency and severity versus placebo while magnesium aspartate did not, with diarrhea reaching 18.6 percent and certainty rated low. A 2023 meta-analysis of seven small trials in 325 adults with depressive disorder reported a standardized mean difference of –0.92, a large figure resting on largely unblinded work.

THE FORM AND LABEL PROBLEM

NIH's Office of Dietary Supplements notes the aspartate, citrate, lactate and chloride forms are absorbed more completely than oxide and sulfate. The bigger retail problem is the label. ICP-OES testing of sixteen magnesium glycinate products sold on Amazon found twelve met their total-magnesium claim, but only the sponsor's own met the claim for soluble chelated magnesium; several listed compound rather than elemental weight; and glycine was present but apparently unbound — the signature of cheap oxide blended with loose glycine. That work was competitor-funded, so read it as directional.

Formulation matters even when the salt is identical. An in vitro study published in early September 2026 compared two commercial bisglycinates of similar magnesium content and found 17 percent higher availability and more dialyzable magnesium in one (53 versus 39 mg, $p = 0.0009$). Industry-run and unconfirmed in humans, but it supports the practical rule: buy on stated elemental content and "fully reacted" chelate, not on the name of the salt.

BOTTOM LINE

Magnesium is worth taking if you have a plausible reason to be low — habitually low intake, long-term proton-pump inhibitor or diuretic use, type 2 diabetes, heavy alcohol use, or age past seventy — and worth modest expectations otherwise. Two hundred to 400 mg/day of elemental magnesium as bisglycinate, citrate or malate, with food, is the defensible protocol; oxide is a laxative, not a repletion strategy. Confirm kidney function first, separate it from bisphosphonates and the antibiotics named above, and buy on stated elemental content. Do not buy it for leg cramps, and do not expect it to fix insomnia.

SOURCES

1. "Comprehensive Effects of Magnesium Supplementation on Cardiometabolic Risk Factors." Nutrients, July 2026 (78 RCTs).
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3. "Magnesium Supplementation for Sleep in Adults." Journal of Dietary Supplements, August 2026.
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6. NIH Office of Dietary Supplements, "Magnesium — Health Professional Fact Sheet"; Costello R, et al., Advances in Nutrition, 2023.
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