

Magnesium Buffered Chelate



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Magnesium Buffered Chelate contains highly absorbable magnesium, with each 2-capsule serving providing 300 mg of elemental magnesium. Owing to a process that forms a stable chelate between each magnesium ion and two molecules of the amino acid glycine, this product should not cause the unfavorable gastrointestinal symptoms associated with magnesium supplementation, such as loose stools or upset stomach.* Because of this, this chelated form of magnesium may be especially beneficial for those who require high doses of this mineral.

Magnesium (Mg) is an essential mineral that serves as an enzyme cofactor for over three hundred biochemical reactions in the body.¹ Magnesium follows potassium as the second most abundant intracellular cation (positively charged electrolyte) in the body.² The adult human body contains approximately 25 grams of Mg, over 60% of which is found in the skeleton. Muscle tissue contains about 27%, with the bulk of the balance found in other intracellular areas, and less than 1% occurring in the blood.³ As a structural component of the hydroxyapatite mineral matrix of bone, a natural calcium channel blocker, muscle relaxant, facilitator of calming effects upon the nervous system, and a required element for electrolyte balance and proper functioning of sodium-potassium pumps, Mg plays a crucial role in muscle contraction and relaxation, cardiovascular and neurological function, calcium homeostasis and more. Magnesium's role as an enzyme cofactor for processes that generate ATP underlies its importance for maintaining energy levels and healthy metabolic function.

May be beneficial for*:

- ATP generation and overall metabolism
- Bone health
- Skeletal and cardiac muscle function
- Physical and mental relaxation
- Neurological health
- Healthy blood glucose metabolism
- Kidney health
- Blood vessel health and maintenance of healthy blood pressure

Why Magnesium Buffered Chelate?

The magnesium amino acid chelate in this product is absorbed via dipeptide channels, bypassing the usual active transport and passive diffusion routes for intestinal ion absorption, where Mg would otherwise compete with other minerals. This method of delivery allows larger amounts of Mg to be absorbed more quickly and be better retained by the body, as compared to many other forms.⁴

The Mg-glycine complex protects Mg from binding to dietary phytates and tannins, thereby reducing absorption interference and enhancing bioavailability.⁴ This unique form of Mg has been shown to be effective for individuals with the greatest impairments in magnesium absorption, such as those with inflammatory bowel conditions, among whom the prevalence of overt Mg deficiency may be as high as 86%.⁵ Compared to healthy subjects, those with compromised intestinal mineral absorption excrete twice as much Mg when given insoluble salt forms (such as Mg oxide), as opposed to a chelate.

Benefits*

Bone health: The practice of supplementing solely with calcium in the absence of required vitamin and mineral cofactors—such as Mg—may not have the intended effect of reversing or preventing bone loss. Magnesium is an essential element of the physical structure of bone tissue and helps contribute to maintaining bone mass. It was recently discovered that vitamin D bioactivity is Mg-dependent, as all enzymes involved in vitamin D metabolism appear to require Mg.⁶ Researchers have written, "Consuming the RDA of magnesium may be more effective in preventing bone thinning than vitamin D, as magnesium potentiates vitamin D activities, possibly by increasing its absorption and endogenous activation."⁶ Mg also plays a role in secretion of parathyroid hormone (PTH) and expression of PTH receptors, further contributing to proper calcium homeostasis and bone remodeling.⁷

Digestive health: Patients with compromised digestive function—such as those who have been on long-term proton pump inhibitors (PPIs) or other stomach acid-reducing drugs—may benefit from supplemental Mg, as hypochlorhydria may prevent adequate liberation of minerals from their food bases, including Mg. Numerous reviews and meta-analyses show that long-term use of these popular drugs is associated with hypomagnesemia and increased risk for bone fractures and adverse cardiovascular outcomes.⁸⁻¹⁷

Cardiovascular function: Owing to its role in muscle contraction and relaxation, healthy endothelial function and nerve conduction, Mg may help support cardiovascular function and healthy blood pressure. Hypomagnesemia and/or low Mg intake are associated with hypertension, dyslipidemia, endothelial dysfunction, coronary artery disease, arrhythmias, heart failure and sudden cardiac death.^{18,19} Moreover, Mg is a cofactor for the desaturase enzymes involved in synthesizing anti-inflammatory and vasodilating prostaglandins (PGE1). As such, it has been shown to reduce blood pressure in hypertensive patients, with those having the highest blood pressure exhibiting the most favorable and significant responses.

Additionally, Mg supplementation may have an additive effect when combined with hypertensive drugs, contributing to an even greater reduction in blood pressure.²⁰ Magnesium may contribute to proper calcium trafficking in the body, and low serum Mg is independently associated with greater coronary artery calcification (CAC).²¹ Mg promotes healthy cardiovascular function via several mechanisms, such as helping to regulate cardiac muscle function (protecting against development of arrhythmia and heart failure), protecting against calcification, and supporting healthy endothelial function and blood vessel relaxation, which contributes to healthy blood pressure.^{22,23}

Glucose metabolism & insulin resistance: Research supports an association between Mg deficiency, insulin resistance and type 2 diabetes (T2D). Estimated Mg intake has a significant inverse association with T2D²⁴ as well as stroke in a dose-dependent manner.²⁵ As much as 48% of those with T2D may have hypomagnesemia,²⁶ and serum Mg levels have been found to correlate negatively with HbA1c, fasting glucose and insulin, duration of diabetes, and 2-hour post-load glucose response to an oral glucose tolerance test.^{27,28}

Magnesium is a required cofactor for several individual biochemical reactions in glycolysis and oxidative phosphorylation (the Krebs cycle), making it essential for proper metabolism of glucose and converting carbohydrates and fats into energy (ATP).²⁹ Mg plays a key role in insulin-mediated glucose uptake. Reduced intracellular Mg concentration results in lower activity of the tyrosine-kinase enzyme required for proper functioning of the insulin receptor, which may contribute to insulin resistance.^{30,31} Many studies have demonstrated positive effects on the metabolic profile of type-2 diabetics supplementing with Mg.^{31,32} Cardiovascular disease is the leading cause of death among those with T2D; higher estimated dietary Mg intake and higher plasma Mg levels were associated with a lower prevalence of coronary heart disease in T2D patients.³³

Kidney function: Lower serum Mg levels and lower estimated dietary Mg intake are associated with increased risk for chronic kidney disease (CKD) and progression to end-stage renal disease (ESRD).³⁴ Serum magnesium concentration also shows a consistent inverse association with all-cause and cardiovascular mortality in CKD patients. Hypertension and T2D are the leading causes of CKD and ESRD,³⁵ so the beneficial effects of Mg on glycemia and insulin sensitivity may cascade into protecting kidney health as well. Low serum Mg was independently associated with all-cause mortality³⁶ as well as declining estimated glomerular filtration rate (eGFR) in a large multiethnic cohort, and eGFR decline was greater in subjects with diabetes.³⁷

Regarding kidney stones, low Mg levels are common in patients prone to developing stones. Increased urinary Mg concentrations have been shown to reduce the formation and decrease the size of calcium oxalate crystals, possibly by forming soluble complexes with oxalate. Mg may also reduce absorption of oxalates by binding exogenous oxalate in the intestine.^{38,39} The delicate balance between calcium and Mg suggests that adequate Mg levels may protect against inappropriate deposition of calcium in the soft tissue, particularly when combined with vitamin K2.⁴⁰ Among patients with CKD, serum Mg levels were inversely correlated with CAC density.⁴⁰

Chronic headaches: Magnesium supplementation has long been known to reduce the frequency and severity of migraines and milder forms of headaches.^{42,43} With this in mind, and noting that as many as half of all migraine sufferers may be Mg-deficient, researchers have gone so far as to say that “oral magnesium is warranted in all migraine sufferers.”⁴² Regarding migraine prophylaxis, adequate Mg is critical for maintaining the electrolyte balance that contributes to proper polarization of neuronal membranes.³ Overlapping pathophysiologic mechanisms have been noted between migraine and epilepsy; it is possible that abnormalities in neuronal polarization and excitability may contribute to migraine, as they are known to do in seizure disorders.⁴⁴

Women’s health: A review of the use of Mg in gynecology determined that Mg deficiency may contribute to numerous women’s health concerns, such as dysmenorrhea, premenstrual syndrome, menstrual migraine, and postmenopausal symptoms, and that supplementation may help prevent or relieve these.^{45,46} Supplemental Mg may also positively impact eclampsia, pre-eclampsia and leg cramps during pregnancy.^{47,48}

Supplement Facts

Serving Size 2 capsules
Servings Per Container 30

Amount Per Serving	% Daily Value	
Magnesium	300 mg	71%
(as TRAACS® Magnesium Bisglycinate Chelate Buffered- from Magnesium Bisglycinate Chelate and Magnesium Oxide)		

Other Ingredients: Cellulose (capsule), vegetable stearate.

Recommended Use:

- Take two capsules per day, or as directed by your health care practitioner.

For a list of references cited in this document, please visit:

<http://www.designsforhealth.com/techsheet-references/magnesium-buffered-chelate-references.pdf>

Dosing recommendations are given for typical use based on an average 150 pound healthy adult. Healthcare practitioners are encouraged to use clinical judgement with case-specific dosing based on intended goals, subject body weight, medical history, and concomitant medication and supplement usage.

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*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

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