Trending Supplements Explained: How to Approach and Practical Applications

Introduction to Supplements

- Plants used for medicinal purposes for thousands of years
- Standardized pharmaceuticals started replacing plants in 1920’s
- Vitamins and supplements are becoming increasingly popular
- United States spent an estimated $64 billion in 2025[5]
- Heavily marketed through different channels
- 74% of adults take at least 1 supplement[6]

Why people take supplements

- Helping with chronic common conditions[7]
- Fill nutritional gaps left open by diet[6]
- Improve overall health and wellness[6]
- Belief that supplements are more natural and safe[8]

Regulation

- Vitamins and herbals are classified as supplements
- Over-the-counter supplements aren’t regulated by the FDA
- Aren’t meant to treat, prevent, or cure diseases
- Fraudulent supplements continue to arise
- Look for United States Pharmacopeia (USP) or National Sanitation Foundation (NSF)
- Be aware of marketing and sources

Magnesium

Magnesium

- Fourth most abundant mineral in the body[9]
- Contained in green leafy vegetables, legumes, nuts, and seeds
- Involved in over 300 essential metabolic reactions[9]
  - Energy production
  - Blood pressure regulation
  - Insulin metabolism
  - Muscle contraction
  - Nerve transmission

Magnesium

- 60% stored within bone[9]
- Mainly absorbed in the small intestine[9]
- 24% - 74% of dietary magnesium is absorbed[9]
- Excretion regulated by the kidney[9]

Magnesium

- Up to two-thirds of Americans don’t obtain enough in diet[11]

- Low magnesium may be involved in various health conditions[9]
  - Alzheimer’s disease
  - Type-2 diabetes
  - Hypertension
  - Migraine headaches

Magnesium

- Magnesium deficiency[9]
  - Not uncommon in general population
  - Serum concentration of <0.75 mmol/L
  - Early signs are non-specific
    - Loss of appetite
    - Lethargy
    - Nausea
    - Vomiting
    - Fatigue
    - Weakness

Magnesium

- Conditions that may lead to low magnesium[9]
  - Alcoholism
  - Poorly controlled diabetes
  - Malabsorption
  - Renal disease
  - Medication use

Forms of Magnesium

- Magnesium citrate
- Magnesium oxide
- Magnesium chloride
- Magnesium lactate
- Magnesium malate
- Magnesium L-threonate
- Magnesium sulfate
- Magnesium glycinate
- Magnesium orotate

Magnesium citrate

- Formed by binding with citric acid
- Easily absorbed[12]
- Common form can be purchased in stores
- Taken to replenish low magnesium levels
- Natural laxative effect
  - Used in higher doses to treat constipation
- Marketed for depression/anxiety[13]
  - More research is needed

Magnesium oxide

- Salt that combines magnesium and oxygen
- Sold in powder or capsule
- Poorly absorbed in GI tract[11]
- Not typically used to treat deficiencies
- Used to treat heartburn, indigestion, and constipation
- Possible use as migraine treatment/preventative[14]
  - More research needed

Magnesium chloride

- Magnesium salt that includes chlorine
- Well absorbed in digestive tract[1]
- Used to treat low magnesium levels, heartburn, constipation[1]
- Also used in lotions/ointments to sooth/relax muscles[15]
  - Little scientific evidence topicals improve levels

Magnesium lactate

- Salt formed when magnesium binds with lactic acid
- Used as a food additive
- Regulates acidity and fortifies foods and beverages
- Less common as over-the-counter supplement
- Easily absorbed in GI tract[11]
- May be easier on digestive system than other types[16]
- Potential benefit for those who need large doses[16]

Magnesium malate

- Includes malic acid
- Well absorbed in GI tract[17]
- Used to replenish magnesium levels[17]
- Gentle on GI system
- Reported less laxative effect
- Studies show fibromyalgia and chronic fatigue benefits[18]
    - Higher quality studies needed

Magnesium L-threonate

- Salt formed by mixing magnesium with threonic acid
- Easily absorbed
- May be effective for increasing brain magnesium concentrations[20]
- Potential benefits in depression, Alzheimer’s disease, memory loss[19]
- More research needed

Magnesium sulfate

- Formed by combining magnesium, sulfur, and oxygen
- Known as Epsom salt
- Found in skin care products
- Dissolved in water to treat stress and sore muscles
- Little evidence it’s well absorbed through skin[21]

Magnesium glycinate

- Formed from magnesium and the amino acid glycine
- Found in fish, meat, dairy, legumes
- Easily absorbed
- May help with anxiety, depression, stress, insomnia[22]
- Limited scientific evidence

Magnesium orotate

- Formed with orotic acid
- Easily absorbed[23]
- Weak laxative effects[23]
- Research suggests promotion of heart health[24]
- Popular among athletes/fitness enthusiasts[23]
- Expensive
- More research is needed

Dosage and formulations

- Maximum recommended daily dose[1]
  - 320 mg for females
  - 420 mg for males

- Watch labels for different forms and dosages

Clinical considerations

- Evidence suggests no benefit if magnesium levels aren’t low
- Dietary intake is preferred
  - Legumes, vegetables, nuts, whole grains
- Supplement if diet alone isn’t adequate
- Use chloride, citrate, gluconate, orotate due to high bioavailability[9]
- Older adults, type 2 diabetes, digestive disorders
  - May be of greater risk of deficiency

Side effects and Safety

- Generally considered safe for most people

- Certain forms or excess doses may cause diarrhea/GI upset[1]

- Toxicity side effects[1](rare)
  - Nausea/vomiting
  - Diarrhea
  - Muscle weakness
  - Irregular breathing
  - Lethargy
  - Urinary retention

Side effects and Safety

- Drug interactions[9,10]
  - Bisphosphonates
  - Fluoroquinolones, Tetracyclines, Nitrofurantoins
  - Gabapentin
  - Diuretics
  - Zinc
  - Calcium
  - Some antivirals

Creatine

Introduction

- One of most widely used dietary supplements worldwide
- Naturally produced in the body
- Found in animal products (beef, chicken, pork, fish)
- Made from glycine, arginine, and methionine[3]
- Plays critical role in cellular energy production[2]
- Popular among athletes and exercising individuals

Potential benefits

- Increasing muscle strength, power, and endurance[24,26]
  - Adequate availability ensures body can replenish ATP
  - Efficient supplement for muscle growth
  - Improving muscle recovery

- Support Brain Health[27,28,30]
  - Improvement in cognitive function
  - Aide in mood support

Potential benefits

- Older adults
  - Improvement in muscle mass and strength combined with resistance training[2,25]
  - Potential to increase brain health[27]
  - Memory improvement[28]
  - More research is needed

Dosage and formulations

- Creatine monohydrate
  - Most widely used, recommended and studied form[2]
  - Other types ethyl ester, hydrochloride, and magnesium

- Powder and liquid

- 3-5 g/day or 0.1 g/kg of body mass/day[2]

Side effects and Safety

- Normally well tolerated at recommended dosages[29]
  - GI upset
  - Cramping
  - Bloating
  - Diarrhea

Side effects and Safety

- Caution in Kidney disease[31]
- Drug interactions: none well documented
  - Caffeine
  - Diuretics
  - Probenecid

Clinical considerations

- Primarily taken to improve athletic performance
- Has been used for centuries
- Hundreds of studies support its safety and effectiveness
- May help keep muscles and bones healthy as age increases
- Little risk if taken at appropriate dose

Ashwagandha

Introduction

- Botanical name: *Withania somnifera*
- Common Names: Ashwagandha, Indian ginseng, Winter cherry
- Small evergreen shrub with yellow flowers
- Found in India, Africa, and parts of Middle East
- Used for thousands of years[33]

How it works

- Contains several biologically active constituents[44]
- May help control mediators of stress[37,44]
- Modulates hypothalamic-pituitary-adrenal (HPA) axis[37,44]
- Modulates sympathetic nervous system[44]
- Exhibits anti-inflammatory, antioxidant, neuroprotective properties[44]

Potential Benefits

- Research shows potential benefit
  - Stress reduction[35,36]
  - Improvement in sleep quality[37]

- Research is inconclusive
  - Anxiety[34,36]
  - Athletic performance[34]
  - Reduce blood sugar levels[38]

Dosage and Formulations

- Available in capsule, powder, gummies, and liquid extracts
- Supplements contain ashwagandha root, leaf, or root/leaf extracts[34]
- 250-500mg suggested by most research[39,40,41,42,43]

Side Effects and Safety

- May cause in some individuals[34]
  - Drowsiness
  - Stomach upset
  - Diarrhea
  - Vomiting
- Rare link to liver injury
- Long term safety inconclusive[34]

Side Effects and Safety

- Likely safe short term (up to 3 months)[34]
- Avoid during pregnancy and breastfeeding[34]
- Not for those with upcoming surgery, autoimmune or thyroid disorders[34]
- Avoid in hormone sensitive prostate cancer[34]

Side Effects and Safety

- Drug interactions[4]
  - Benzodiazepines and other sleep medications[4]
  - Opioid pain medications
  - Barbiturates
  - Thyroid hormone and antithyroid medications
  - Diabetic medications
  - Immunosuppressants
  - Blood pressure medications
  - Antidepressants*

Clinical considerations

- Clinical trials have small sample sizes
- Variety of ashwagandha preparations
- May be effective for insomnia and stress
- Likely safe for most people when used short term

Thank you

References

1. “Magnesium - Health Professional Fact Sheet.” *Office of Dietary Supplements (ODS)*, https://ods.od.nih.gov/factsheets/Magnesium-HealthProfessional/. Accessed 24 Feb. 2026.

2. “Common Questions and Misconceptions about Creatine Supplementation: What Does the Scientific Evidence Really Show? - PMC.” *PMC Home*, https://pmc.ncbi.nlm.nih.gov/articles/PMC7871530/. Accessed 24 Feb. 2026.

3. Brosnan ME, Brosnan JT. The role of dietary creatine. Amino Acids. 2016 Aug;48(8):1785-91. doi: 10.1007/s00726-016-2188-1. Epub 2016 Feb 13. PMID: 26874700.

4. “How Medications and Supplements Can Interact | NCCIH.” *NCCIH*, https://www.nccih.nih.gov/health/know-science/how-medications-and-supplements-can-interact/some-supplements-may-increase-the-effects-and-side-effects-of-medications#:~:text=. Accessed 24 Feb. 2026.

5. “Dietary Supplements Market Size | Industry Report, 2033.” *Market Research Reports & Consulting | Grand View Research, Inc.*, https://www.grandviewresearch.com/industry-analysis/dietary-supplements-market-report. Accessed 24 Feb. 2026.

6. “Three-Quarters of Americans Take Dietary Supplements; Most Users Agree They Are Essential to Maintaining Health, CRN Consumer Survey Finds.” *CRNUSA*, 25 Feb. 2026, https://www.crnusa.org/newsroom/three-quarters-americans-take-dietary-supplements-most-users-agree-they-are-essential.

References

7. Kaufman DW, Kelly JP, Rosenberg L, Anderson TE, Mitchell AA. Recent patterns of medication use in the ambulatory adult population of the United States: the Slone survey. JAMA. 2002 Jan 16;287(3):337-44. doi: 10.1001/jama.287.3.337. PMID: 11790213.

8. Kaptchuk TJ, Eisenberg DM. The persuasive appeal of alternative medicine. Ann Intern Med. 1998 Dec 15;129(12):1061-5. doi: 10.7326/0003-4819-129-12-199812150-00011. PMID: 9867762.

9. Gröber U, Schmidt J, Kisters K. Magnesium in Prevention and Therapy. Nutrients. 2015 Sep 23;7(9):8199-226. doi: 10.3390/nu7095388. PMID: 26404370; PMCID: PMC4586582.

10. Gröber U. Magnesium and Drugs. Int J Mol Sci. 2019 Apr 28;20(9):2094. doi: 10.3390/ijms20092094. PMID: 31035385; PMCID: PMC6539869.

11. Schwalfenberg GK, Genuis SJ. The Importance of Magnesium in Clinical Healthcare. Scientifica (Cairo). 2017;2017:4179326. doi: 10.1155/2017/4179326. Epub 2017 Sep 28. PMID: 29093983; PMCID: PMC5637834.

12. Werner T, Kolisek M, Vormann J, Pilchova I, Grendar M, Struharnanska E, Cibulka M. Assessment of bioavailability of Mg from Mg citrate and Mg oxide by measuring urinary excretion in Mg-saturated subjects. Magnes Res. 2019 Aug 1;32(3):63-71. doi: 10.1684/mrh.2019.0457. PMID: 32162607.

References

13. Kirkland AE, Sarlo GL, Holton KF. The Role of Magnesium in Neurological Disorders. Nutrients. 2018 Jun 6;10(6):730. doi: 10.3390/nu10060730. PMID: 29882776; PMCID: PMC6024559.

14. Domitrz I, Cegielska J. Magnesium as an Important Factor in the Pathogenesis and Treatment of Migraine-From Theory to Practice. Nutrients. 2022 Mar 5;14(5):1089. doi: 10.3390/nu14051089. PMID: 35268064; PMCID: PMC8912646.

15. Engen DJ, McAllister SJ, Whipple MO, Cha SS, Dion LJ, Vincent A, Bauer BA, Wahner-Roedler DL. Effects of transdermal magnesium chloride on quality of life for patients with fibromyalgia: a feasibility study. *J Integr Med*. 2015; 13(5): 306–313

16. Robinson CM, Karet Frankl FE. Magnesium lactate in the treatment of Gitelman syndrome: patient-reported outcomes. Nephrol Dial Transplant. 2017 Mar 1;32(3):508-512. doi: 10.1093/ndt/gfw019. PMID: 26940126; PMCID: PMC5837242.

17. Uysal N, Kizildag S, Yuce Z, Guvendi G, Kandis S, Koc B, Karakilic A, Camsari UM, Ates M. Timeline (Bioavailability) of Magnesium Compounds in Hours: Which Magnesium Compound Works Best? Biol Trace Elem Res. 2019 Jan;187(1):128-136. doi: 10.1007/s12011-018-1351-9. Epub 2018 Apr 21. PMID: 29679349.

References

18. Boulis M, Boulis M, Clauw D. Magnesium and Fibromyalgia: A Literature Review. J Prim Care Community Health. 2021 Jan-Dec;12:21501327211038433. doi: 10.1177/21501327211038433. PMID: 34392734; PMCID: PMC8371721.

19. Zhang C, Hu Q, Li S, Dai F, Qian W, Hewlings S, Yan T, Wang Y. A Magtein®, Magnesium L-Threonate, -Based Formula Improves Brain Cognitive Functions in Healthy Chinese Adults. Nutrients. 2022 Dec 8;14(24):5235. doi: 10.3390/nu14245235. PMID: 36558392; PMCID: PMC9786204.

20. Shen Y, Dai L, Tian H, Xu R, Li F, Li Z, Zhou J, Wang L, Dong J, Sun L. Treatment Of Magnesium-L-Threonate Elevates The Magnesium Level In The Cerebrospinal Fluid And Attenuates Motor Deficits And Dopamine Neuron Loss In A Mouse Model Of Parkinson's disease. Neuropsychiatr Dis Treat. 2019 Nov 11;15:3143-3153. doi: 10.2147/NDT.S230688. PMID: 31806980; PMCID: PMC6857673.

21. Gröber U, Werner T, Vormann J, Kisters K. Myth or Reality-Transdermal Magnesium? Nutrients. 2017 Jul 28;9(8):813. doi: 10.3390/nu9080813. PMID: 28788060; PMCID: PMC5579607.

22. Yablon LA, Mauskop A. Magnesium in headache. In: Vink R, Nechifor M, editors. Magnesium in the Central Nervous System [Internet]. Adelaide (AU): University of Adelaide Press; 2011. Available from: https://www.ncbi.nlm.nih.gov/books/NBK507271/

References

23. Schiopu C, Ștefănescu G, Diaconescu S, Bălan GG, Gimiga N, Rusu E, Moldovan CA, Popa B, Tataranu E, Olteanu AV, Boloș A, Ștefănescu C. Magnesium Orotate and the Microbiome-Gut-Brain Axis Modulation: New Approaches in Psychological Comorbidities of Gastrointestinal Functional Disorders. Nutrients. 2022 Apr 9;14(8):1567. doi: 10.3390/nu14081567. PMID: 35458129; PMCID: PMC9029938.

24. Wax B, Kerksick CM, Jagim AR, Mayo JJ, Lyons BC, Kreider RB. Creatine for Exercise and Sports Performance, with Recovery Considerations for Healthy Populations. Nutrients. 2021 Jun 2;13(6):1915. doi: 10.3390/nu13061915. PMID: 34199588; PMCID: PMC8228369.

25. Candow DG, Chilibeck PD, Forbes SC. Creatine supplementation and aging musculoskeletal health. Endocrine. 2014 Apr;45(3):354-61. doi: 10.1007/s12020-013-0070-4. Epub 2013 Nov 5. PMID: 24190049.

26. Wu SH, Chen KL, Hsu C, Chen HC, Chen JY, Yu SY, Shiu YJ. Creatine Supplementation for Muscle Growth: A Scoping Review of Randomized Clinical Trials from 2012 to 2021. Nutrients. 2022 Mar 16;14(6):1255. doi: 10.3390/nu14061255. PMID: 35334912; PMCID: PMC8949037.

27. Xu C, Bi S, Zhang W, Luo L. The effects of creatine supplementation on cognitive function in adults: a systematic review and meta-analysis. Front Nutr. 2024 Jul 12;11:1424972. doi: 10.3389/fnut.2024.1424972. Erratum in: Front Nutr. 2025 Feb 17;12:1570800. doi: 10.3389/fnut.2025.1570800. PMID: 39070254; PMCID: PMC11275561.

References

28. Avgerinos KI, Spyrou N, Bougioukas KI, Kapogiannis D. Effects of creatine supplementation on cognitive function of healthy individuals: A systematic review of randomized controlled trials. Exp Gerontol. 2018 Jul 15;108:166-173. doi: 10.1016/j.exger.2018.04.013. Epub 2018 Apr 25. PMID: 29704637; PMCID: PMC6093191.

29. Ostojic SM, Ahmetovic Z. Gastrointestinal distress after creatine supplementation in athletes: are side effects dose dependent? Res Sports Med. 2008;16(1):15-22. doi: 10.1080/15438620701693280. PMID: 18373286.

30. Gutiérrez-Hellín J, Del Coso J, Franco-Andrés A, Gamonales JM, Espada MC, González-García J, López-Moreno M, Varillas-Delgado D. Creatine Supplementation Beyond Athletics: Benefits of Different Types of Creatine for Women, Vegans, and Clinical Populations-A Narrative Review. Nutrients. 2024 Dec 29;17(1):95. doi: 10.3390/nu17010095. PMID: 39796530; PMCID: PMC11723027.

31. Vega J, Huidobro E JP. Efectos en la función renal de la suplementación de creatina con fines deportivos [Effects of creatine supplementation on renal function]. Rev Med Chil. 2019 May;147(5):628-633. Spanish. doi: 10.4067/S0034-98872019000500628. PMID: 31859895.

32. NatMed. Creatine. In: *NatMed*. NatMed; 2026.

References

33. Tandon N, Yadav SS. Safety and clinical effectiveness of Withania Somnifera (Linn.) Dunal root in human ailments. J Ethnopharmacol. 2020 Jun 12;255:112768. doi: 10.1016/j.jep.2020.112768. Epub 2020 Mar 19. PMID: 32201301.

34. "Ashwagandha: Usefulness and Safety | NCCIH." *NCCIH*, https://www.nccih.nih.gov/health/ashwagandha. Accessed 25 Feb. 2026.

35. Lopresti AL, Smith SJ, Malvi H, Kodgule R. An investigation into the stress-relieving and pharmacological actions of an ashwagandha (Withania somnifera) extract: A randomized, double-blind, placebo-controlled study. Medicine (Baltimore). 2019 Sep;98(37):e17186. doi: 10.1097/MD.0000000000017186. PMID: 31517876; PMCID: PMC6750292.

36. Speers AB, Cabey KA, Soumyanath A, Wright KM. Effects of *Withania somnifera* (Ashwagandha) on Stress and the Stress-Related Neuropsychiatric Disorders Anxiety, Depression, and Insomnia. Curr Neuropharmacol. 2021;19(9):1468-1495. doi: 10.2174/1570159X19666210712151556. PMID: 34254920; PMCID: PMC8762185.

37. Salve J, Pate S, Debnath K, Langade D. Adaptogenic and Anxiolytic Effects of Ashwagandha Root Extract in Healthy Adults: A Double-blind, Randomized, Placebo-controlled Clinical Study. Cureus. 2019 Dec 25;11(12):e6466. doi: 10.7759/cureus.6466. PMID: 32021735; PMCID: PMC6979308.

References

38. Durg S, Bavage S, Shivaram SB. Withania somnifera (Indian ginseng) in diabetes mellitus: A systematic review and meta-analysis of scientific evidence from experimental research to clinical application. Phytother Res. 2020 May;34(5):1041-1059. doi: 10.1002/ptr.6589. Epub 2020 Jan 23. PMID: 31975514.

39. Remenapp A, Coyle K, Orange T, Lynch T, Hooper D, Hooper S, Conway K, Hausenblas HA. Efficacy of Withania somnifera supplementation on adult's cognition and mood. J Ayurveda Integr Med. 2022 Apr-Jun;13(2):100510. doi: 10.1016/j.jaim.2021.08.003. Epub 2021 Nov 25. PMID: 34838432; PMCID: PMC8728079.

40. Majeed, Muhammed PhDa,b; Nagabhushanam, Kalyanam PhDb; Mundkur, Lakshmi PhDa,*. A standardized Ashwagandha root extract alleviates stress, anxiety, and improves quality of life in healthy adults by modulating stress hormones: Results from a randomized, double-blind, placebo-controlled study. Medicine 102(41):p e35521, October 13, 2023. | DOI: 10.1097/MD.0000000000035521

41. Majeed, Muhammed PhDa,b; Nagabhushanam, Kalyanam PhDb; Mundkur, Lakshmi PhDa,*. A standardized Ashwagandha root extract alleviates stress, anxiety, and improves quality of life in healthy adults by modulating stress hormones: Results from a randomized, double-blind, placebo-controlled study. Medicine 102(41):p e35521, October 13, 2023. | DOI: 10.1097/MD.0000000000035521

References

42. “Ashwagandha: Uses and Side Effects.” *Cleveland Clinic*, https://health.clevelandclinic.org/what-is-ashwagandha. Accessed 25 Feb. 2026.

43. “Ashwagandha: Is It Helpful for Stress, Anxiety, or Sleep? - Health Professional Fact Sheet.” *Office of Dietary Supplements (ODS)*, https://ods.od.nih.gov/factsheets/Ashwagandha-HealthProfessional/. Accessed 25 Feb. 2026.

44. Wiciński M, Fajkiel-Madajczyk A, Sławatycki J, Szambelan M, Szyperski P, Wojciechowski P, Wójcicki J, Gawryjołek M. Ashwagandha (*Withania somnifera*) and Its Effects on Well-Being-A Review. Nutrients. 2025 Jun 27;17(13):2143. doi: 10.3390/nu17132143. PMID: 40647248; PMCID: PMC12252077.