

Made in U.S.A.

Vitravo® Glucosamine 4 in 1 Formula

Plus Calcium & Vitamin D3 Effective & Reliable 4 in 1 Formula

Aging, physical exercise, imbalance diet are some of the factors that physically challenge joint and bone health. Vitravo® Glucosamine 4 in 1 Formula is a specially formulated product that provides components for maintaining healthy joints and bones. It replenishes bone density and lubricates joint cartilage, providing double benefits in one daily tablet.

Cartilage Deterioration Causes Pain

Cartilage provides a low-friction surface that covers the ends of the bones. It has viscoelastic properties that provide lubrication during motion, shock absorbency, and load support.^[1,2] Aging, injury or degenerative joint problems will accelerate the damage or erosion of cartilage tissues.^[1] Without the protection from cartilage, the ends of the joint bones will have bony overgrowth and often swell, resulting in stiff and painful joints.^[3]

Glucosamine & Chondroitin Help Rebuild Cartilage

Glucosamine is an amino sugar which exists in our body in form of proteoglycans.^[1] Proteoglycan is found in articular cartilage and other connective tissues. Its viscoelastic property keeps large amount of water in cartilage, and makes glucosamine a key component of articular cartilage. Deficiency symptoms of glucosamine may include joint swelling, soreness, hip discomfort, varicose veins, degeneration of spinal column, vertebral bone and knee canopy.^[4-6]

Chondroitin is an important structural component of cartilage and provides much of its resistance to compression. It is a complex carbohydrate that helps cartilage to retain water. It may also block enzymes that break down cartilage, and provide building blocks for the body to produce new cartilage.^[7]

Calcium and Vitamin D3 to Maintain Strong Bones

Our bones have significant physical functions like support, protection and exercise. It also acts as storage and reservoir for calcium.^[8] When the body is deficient of calcium, our bones and teeth will become fragile, and we can neither maintain normal heartbeat, nor control body movement and metabolism. In aging adults, particularly among postmenopausal women, bone breakdown exceeds formation, resulting in bone loss that increases the risk of bone fracture over time.^[9]

Vitamin D3, also known as cholecalciferol, is a fat soluble vitamin which facilitates body absorption of calcium. Vitamin D3 helps promote intestinal calcium absorption, enhance bone growth and calcification, and keep our teeth strong.^[10,11] Although we can obtain vitamin D3 through diet and sunlight, people nowadays mostly work indoor and thus are at risk of insufficient vitamin D3. It is essential to take dietary supplement for adequate vitamin D3 intake and as such to maintain calcium concentration.

Significant effects observed for continued intake of 3 to 6 months or above:

- ★ Relieve joint pain and swelling^[1,7,12]
- ★ Enhance cartilage recovery and slow down degeneration^[1,7]
- ★ Supplement for synovial fluid^[7]
- ★ Strengthen the flexibility of joints^[7,12,13]
- ★ Enhance walking ability^[13]
- ★ Strengthen bones and maintain bone density^[9-11,14,15]
- ★ Help prevent humpbacked and bone fracture^[9-11,14,15]
- ★ Keep the teeth strong^[9,14,15]
- ★ Proper muscle function^[9,14,15]

Recommended daily dose:

Adults take 1 tablet daily preferably with a meal or as recommended by a physician.

References:

1. McDevitt CA. Biochemistry of articular cartilage - Nature of proteoglycans and collagen of articular cartilage and their role in ageing and in osteoarthritis. *Ann Rheum Dis.* 1973;32(4):364-78.
2. Wright V, Dowson D. Lubrication and cartilage. *J Anat.* 1976;121(Pt 1):107-18.
3. Elderly Health Service, Department of Health, HKSAR. Osteoarthritis of the Knee. Available at: http://www.info.gov.hk/elderly/english/health_problems/eng/osteoarthritis_knee.htm [Last Revision Date: 13 Jan 2015]
4. Antoniou J, Steffen T, Nelson F, Winterbottom N, Hollander AP et al. The human lumbar intervertebral disc: evidence for changes in the biosynthesis and denaturation of the extracellular matrix with growth, maturation, ageing, and degeneration. *J Clin Invest.* 1996;98(4):996-1003.
5. Treatment of Primary and Secondary Osteoarthritis of the Knee. Rockville (MD): Agency for Healthcare Research and Quality (US); 2007 Sep. (Evidence Reports/Technology Assessments, No. 157)
6. Drubaix I, Robert L, Maraval M, Robert AM. Synthesis of glycoconjugates by human diseased veins: modulation by procyanidolic oligomers. *Int J Exp Pathol.* 1997;78(2):117-21.
7. Henrotin Y, Mathy M, Sanchez C, Lambert C. Chondroitin sulfate in the treatment of osteoarthritis: from in vitro studies to clinical recommendations. *Ther Adv Musculoskel Dis.* 2010;2(6):335-48.
8. Institute of Medicine Committee to Review Dietary Reference Intakes for Vitamin D and Calcium; Ross AC, Taylor CL, Yaktine AL, Del Valle HB (eds). *Dietary Reference Intakes for Calcium and Vitamin D.* Washington DC: National Academies Press; 2011.
9. Office of Dietary Supplements. Dietary Supplement Fact Sheet: Calcium. National Institutes of Health. Available at: <http://ods.od.nih.gov/factsheets/Calcium-HealthProfessional/>.
10. Office of Dietary Supplements. Dietary Supplement Fact Sheet: Vitamin D. National Institutes of Health. Reviewed: June 24, 2011. Available at: <http://ods.od.nih.gov/factsheets/VitaminD-HealthProfessional/>.
11. Kulie T, Groff A, Redmer J, Hounshell J, Schragger S. Vitamin D: An Evidence-Based Review. *J Am Board Fam Med.* 2009;22(6):698-706.
12. Sawitzke AD, Shi H, Finco MF, Dunlop DD, Harris CL et al. Clinical efficacy and safety of glucosamine, chondroitin sulphate, their combination, celecoxib or placebo taken to treat osteoarthritis of the knee: 2-year results from GAIT. *Ann Rheum Dis.* 2010;69(8):1459-64.
13. Pavelká K, Gatterová J, Olejarová M, Machacek S, Giacomelli G, Rovati LC. Glucosamine sulfate use and delay of progression of knee osteoarthritis: a 3-year, randomized, placebo-controlled, double-blind study. *Arch Intern Med.* 2002;162(18):2113-23.
14. Institute of Medicine Committee to Review Dietary Reference Intakes for Vitamin D and Calcium; Ross AC, Taylor CL, Yaktine AL, Del Valle HB (eds). *Dietary Reference Intakes for Calcium and Vitamin D.* Washington DC: National Academies Press; 2011.
15. Heaney RP. Calcium intake and disease prevention. *Arq Bras Endocrinol Metabol.* 2006;50(4):685-93.

