

Glucosamine, Chondroitin and MSM...Relieve Pain, Protect and Rebuild Joints Connective Tissue

Damaged and Worn Cartilage Can Be Repaired and Rebuilt

Due to normal wear and tear, tissues are constantly being broken down and replaced or restructured. Aging, disease or injury make conditions less than ideal and tissues are broken down faster than they can be regenerated. When the amount of cartilage matrix degraded by chondrocytic enzymes exceeds the amount of new matrix synthesized, cartilage naturally degenerates. Increased turnover of the cartilage matrix is seen in osteoarthritic joints compared to normal joints. If this process continues, cartilage destruction is followed by hardening and formation of bone spurs in the joint margins. The result is pain, deformity and limited movement in the joint.

When all the raw materials needed are available, cell building is a very efficient process. When there are deficiencies, the new cells may be weak, rigid or deformed. Research shows that, by supplying the body with natural substances that inhibit cartilage breakdown and promote cartilage repair, damaged cartilage can be replaced by healthy new cartilage. These effects have been confirmed with electron micrography.⁽¹⁻³⁾

High Potency Formula Provides Essential Building Materials for Joints and Connective Tissue

Chondroitin sulfate is a glycosaminoglycan (GAG), a type of proteoglycan predominant in the ground substance of cartilage, bone and blood vessels. This ground substance allows cells in tissues to adhere to one another and gives joints their strength and resilience. Its basic structure is a long chain of alternating glucuronic acid and glucosamine sulfate.⁽⁶⁾

In test tubes, chondroitin sulfate stimulates production of cartilage and inhibits enzymes that degrade it.⁽¹⁾ Clinical trials demonstrate improved joint function and mobility, reduced pain and inflammation and an actual reversal of joint degeneration as detected by radiographs. This reversal includes improvement in the volume and quantity of joint connective matrix and synovial fluid.⁽⁷⁾

Both **glucosamine sulfate** and **N-acetyl glucosamine** are involved in formation of connective tissue and can be used to generate the much larger chondroitin sulfate molecules. Glucosamine sulfate is a stabilized compound of glucosamine, whereas N-acetyl glucosamine is derived from glucosamine further along the pathway toward connective tis-

GC-MSM 3550™	
Nutrients to Support the Function and Structure of Joints and Connective Tissue	
Product No. 762	Fill Size: 120 Capsules
Four Capsules Contain:	% Daily Value
Vitamin C (ascorbic acid) -----	100 mg. 167%
Vitamin E (Covitol®) Succinate -----	50 I.U. 167%
Pantothenic Acid (as calcium pantothenate)-	100 mg. 1000%
Manganese (as manganese amino acid chelate)	2 mg. 200%
Molybdenum (as molybdenum amino acid chelate) -----	75 mcg. 100%
Methyl Sulfonyl Methane (Lignisol™ MSM)	1700 mg. *
Glucosamine Sulfate-----	1500 mg. *
Chondroitin Sulfate -----	250 mg. *
N-Acetyl Glucosamine -----	100 mg. *
L-Cysteine -----	100 mg. *
N-Acetyl Cysteine -----	10 mg. *
L-Glutathione (reduced) -----	4 mg. *
Green Shell Mussel -----	50 mg. *
Green shell mussel is a natural source of mucopolysaccharides (chondroitin sulfate) and superoxide dismutase.	
Other ingredients: rice flour, magnesium stearate, gelatin.	
*Daily Value not established.	
Covitol® is a registered trademark of Cognis Corp.	
Lignisol™ MSM is a trademark of Carolwood Corp.	
RECOMMENDED USE: Three to six capsules daily, in divided doses.	

sue formation. Both are important contributors to hyaluronic acid, a major cushioning component of the joints.⁽⁸⁾

In a 3-year, double-blind, placebo-controlled trial of 212 osteoarthritis patients reported in *The Lancet*, patients given the placebo had progressive joint-space narrowing (as shown by radiographs) and their symptoms worsened. Symptoms improved in the glucosamine sulfate group and there was no significant joint-space narrowing.⁽⁵⁾

In several studies, glucosamine helped relieve the joint pain and stiffness of osteoarthritis. With continued use, it was even more effective than ibuprofen for joint pain.⁽⁹⁾ Because glucosamine is not an analgesic or a powerful anti-inflammatory, its beneficial effects do not appear rapidly. However, since it can apparently reverse the disease process, its effects are more pronounced and longer lasting than those of standard treatment.

Methyl sulfonyl methane (MSM) is an excellent source of useable organic sulfur, one of the most important raw materials for building healthy new cells. One of its most significant uses as a supple-

