

TOTAL JOINT SUPPORT

(FORMERLY GLUCOSAMINE PLUS)

Ingredients: Glucosamine Sulphate 100mg, N-Acetyl Glucosamine 50mg, L-Glutathione 2mg, N-Acetyl Cysteine 5mg, L-Cysteine 50mg, L-Glutamic Acid 50mg, L-Glycine 50mg, L-Taurine 25mg, Vitamin C 50mg, Vitamin E (Succinate) 25i.u, Pantothenic Acid 50mg, Soluble Trachea 25mg, Silymarin 5mg, Milk Thistle 100mg, Green Lipped Mussel 25mg.

Supportive Function: Glucosamine Plus is a superb formula tested against individual nutrients for its synergistic action in supporting healthy bone and connective tissue. In the body, some glucosamine sulfate is converted to N-acetyl glucosamine (NAG), which is listed by the Merck Index in its own antiarthritic category. Liver detox, gastrointestinal and antioxidant nutrients all lend support that can be helpful when arthritis affects bone and connective tissue. Mucopolysaccharides are also important building blocks, which are furnished in this formula by green-lipped mussel.

When is glucosamine support helpful? Osteoarthritis, tissue and joint pain, and injury.

Clinical Applications/Research: Glucosamine Sulfate provides the essential building block needed for the construction and repair of joint cartilage, bone, tendons, and ligaments. Glucosamine further transforms into polyglycans that provide the foundation of synovial fluid and the lining of joints. Supplementation with glucosamine sulfate reduces pain and swelling and helps repair joints. Benefits become evident within 8 weeks. Continued supplementation is needed to maintain benefits (Drovanti A, et al, "Therapeutic activity of oral glucosamine sulfate in osteoarthritis: A placebo-controlled double blind investigation," *Clin Ther* 1980; 3(4): 260-72).

N-Acetyl Glucosamine (NAG) has been shown to reduce joint pain, swelling, and restricted motion in clinical trials. NAG is also important in maintaining the protective layer of digestive organs. Dr. Braly found that RA is frequently caused by leaky gut, or abnormal permeability of the intestinal wall, allowing undigested food particles to deposit in tissues resulting in inflammatory responses and autoimmune attacks on many tissues (The Burton Goldberg Group, 1995: 531; Freed D, *Brit Med J* April 1999: 318:1023-25; *J Cell Biochem* 1994; 56: 225-35).

L-Glutathione helps bind with toxins in the liver for removal and helps prevent free-radical damage associated with collagen cross-linking, poor cellular circulation, and stiffness (Chaitow, 1988:88-9). L-Glutathione has been reported to counteract the cross-linking effects and cellular damage of free-radical activity. This tripeptide composed of glutamic acid, Glycine, and cysteine helps deactivate lipid peroxidation, enhance immune system function, and detoxify the heavy metals lead, cadmium, mercury, and aluminum. The primary use of this nutrient has been reported helpful in the prevention and treatment of degenerative conditions. Through the action of glutathione-S transferases, glutathione enables the liver to detoxify undesirable compounds for excretion through the bile (*Functions of Glutathione*, New York: Springer-Verlag, 1978).

N-Acetyl Cysteine has been reported to help prevent degenerative changes in the liver, has strong antioxidant activity, and is generally cell-protective (Gaby, AR, Wright, JV, *J of Advancement in Med Spring* 1993; 6 (1): 27-39). People with Inflammatory Bowel Disease and other

conditions have an impaired metabolism that will not allow them to convert L-Cysteine into its NAG bioactive form. As a liver nutrient, it helps remove toxins that accelerate degeneration and interfere with healing. N-acetyl cysteine is an important building block for L-glutathione (Chaitow, 1988: 79-81).

L-Cysteine cannot be metabolized from the basic amino acid methionine in many chronic diseases, so supplementation has proved useful in many conditions. It helps remove many heavy metal deposits, which suppress immune responses, and protects against environmental pollutants. It also protects the brain, liver, and other organs from the damaging effects of smoking and alcohol. Cysteine boosts the levels of protective enzymes that slow cellular damage (Chaitow, 1988: 95; Balch & Balch, 1997:43).

L-Glutamic Acid serves as a source of fuel for cells lining the intestines, which support uptake of nutrients, and helps prevent bowel permeability noted in arthritis. It has been reported to aid in peptic ulcer healing. It is a component of folic acid and glucose tolerance factor. It is also used to alleviate depression (Lininger, 1998:166, Chaitow, 1998:95, 99).

L-Glycine supplementation has been reported to increase the secretion of gastric acid, which enhances digestion, converts into betaine, important in protein digestion, is a component of bile acids, and is major component of glutathione, which plays a detoxification role in the body (Chaitow, 1988: 83-84). Glutathione has been reported to counteract the cross-linking effects and cellular damage of free-radical activity (*Functions of Glutathione*, New York: Springer-Verlag, 1978).

L-Taurine is a component of bile acids, which are essential in absorbing fats and fat-soluble vitamins such as vitamin A. It is also an important component that helps maintain cell membrane stability (Lininger, 1998:206).

Vitamin C is a very potent antioxidant that protects the cells of the body as well as protecting other antioxidants such as Vitamin E. Vitamin C detoxifies many other harmful substances that threaten to damage the tissues of the body (Balch & Balch, 1997:45). People who have high levels of antioxidants in their diet show a much slower rate of joint deterioration (McAlindon TE, et al, "Do antioxidant micronutrients protect against the development and progression of knee osteoarthritis?" *Arthrit Rheum* 1996; 39:648-56).

Vitamin E is depleted when joints are inflamed with Rheumatoid Arthritis (Lininger et al, 1998:116). Vitamin E supplementation alleviates many symptoms of RA (Sherak O and G Kolarz, "Vitamin E and rheumatoid arthritis," *Arthrit Rheum* 1991; 34:1205-6). Vitamin E has also reduced many symptoms of osteoarthritis (Mackley I, and Ouaknine L, "Tocopherol in osteoarthritis: a controlled pilot study," *J of Am Geriatr Soc* 1978; 25(7): 328-30). Vitamin E is a powerful antioxidant that prevents damage to lipids and the lipid portion of cell membranes. It improves oxygen utilization and enhances immune responses (Balch & Balch, 1997:45).

Pantothenic Acid, also called vitamin B5, may be deficient in people subject to Rheumatoid Arthritis (Lininger et al, 1998:116). Pantothenic acid supplementation alone has been reported to alleviate morning stiffness, disability, and pain (General Practitioner Research Group, "Calcium pantothenate in arthritic conditions," *Practitioner* 1980; 224:208-11).

Soluble Trachea (source of Chondroitin-A): Food sources of chondroitin sulfate only come from animal cartilage such as soluble trachea (Lininger et al, 1998:149). Chondroitin sulfate is a major constituent of bone and cartilage. Cartilage holds water and allows nutrients to pass through its matrix. Animal studies show that chondroitin sulfate may promote the healing of bone (Moss M et al, "The effect of chondroitin sulfate on bone healing," *Oral Surg Oral Med Oral Path* 1965; 20: 795-801). Chondroitin sulfate also helps restore joint function in

some forms of arthritis (Kerzberg FM et al, "Combination of glycosamino-glycans and acetylsalicylic acid in knee osteoarthritis," *Scand J Rheum* 1987; 16:377).

Milk Thistle has been used for 2000 years to support liver function and liver detoxification. It helps protect liver cells by blocking the entrance of toxins and removing toxins from the liver.

Silymarin, a bioflavonoid complex in Milk Thistle, has anti-inflammatory effects on blood platelets and helps prevent inflammatory free-radical production. Silybin, the most active ingredient of Silymarin, has the ability to help regenerate liver cells (Lininger et al, 1992:290-1; Alarcon de la Lastra C et al, *Planta Medica* 1995(61): 116-9; Sonnenbichler J et al, *Proceed of the Internat Bioflav Symp* (Munich, Frg) 1981).

Green Lipped Mussel (Natural source of Mucopolysaccharides and Superoxide Dismutase): Mucopolysaccharides are building blocks for chondroitin sulfate, the major constituent of bone and cartilage (Lininger et al, 1998:149). Superoxide Dismutase (SOD) is a powerful free radical scavenger that helps protect against the superoxide free radical responsible for cartilage damage and pain. SOD is known to repair cells and reduce the rate of cell destruction (Toohey L, "Natural alternatives to drugs," *Nutri-Notes* 1999; 6(3): 3; Balch & Balch, 1997:45).

Testimonials/Nutrient Tidbits: Tidbit: Some people, (especially Inflammatory Bowel Disease people) with compromised health and conversion capabilities, cannot acetylate their glucosamine into N-acetyl glucosamine (NAG). These people miss out on getting one of the most important building blocks of connective tissue. When they take 1500 mg of glucosamine, they are assuming that some will be converted to NAG, however that doesn't happen due to their inability to convert glucosamine to N-acetyl glucosamine. Glucosamine Plus includes a synergistic combination of several building blocks necessary for building healthy cartilage tissue.

Testimonials: In older women with low back pain, hip pain, inguinal pain, sacroiliac pain or leg pain which appears to be associated or referred from a degenerating hip socket, the combination of chiropractic and Glucosamine Plus will usually eliminate most of the pain within three weeks. This has been very consistent and striking. This is much quicker than the response to most products. In one case, a woman (who also had gut problems) went off the Glucosamine Plus and onto a _glucosamine/chondroitin product from the drug store. Within one week her pain was back almost full force. Within 3 days of restarting the Glucosamine Plus the pain started abating again (Daniel Flemming, D.C., Colorado).

Suggested Dosage: 1-2 tablets 3 times daily or as directed

Size: 50 or 120 tablets

Vegetarian: No

Contraindications: High doses of glucosamine sulfate can cause high blood sugar levels and/or GI distress (smaller synergistic amounts are used in this formula and there are no reported problems).