

JOINT CARE SUPREME

The science of joint health rises to new heights:

Many of us recall our "Wonder Years", when we could run and jump and twist and bend our bodies like only a healthy youth can. A healthy youth with "healthy joints", that is. The problem with us humans is that as we age, that resilient, stretchy, bendy tissue that cushions our bones slowly deteriorates. Ultimately, this can lead to bone on bone, which isn't fun. So then, why can't we just eat healthy and take a bunch of vitamins and our joints will heal and repair themselves and live forever? Unfortunately, we weren't designed to have limbs like plastic man until our dying day. There is, however, a way to slow this joint-disintegrating process down....incredibly. Viva Vitamins has taken advantage of the latest research in nutrition and joint health and has incorporated the science of supplementation into one of the best joint health products on the market. Introducing, "Joint Care Supreme."

Cartilage– What is this stuff?

Cartilage is dense connective tissue composed of *chondrocytes*, a unique class of cells that produce a large amount of extracellular matrix composed of collagen fibers, proteoglycan, and elastin fibers. There are three main classes of cartilage: elastic, hyaline, and fibrocartilage. Due to its avascularization (no blood vessels), cartilage is one of the body's slowest growth and repaired tissues. Chondrocytes are fed and nourished through the compression and flexion of the surrounding matrix, thus they are fed by passive diffusion. Hyaline cartilage is what sheaths the ends of bones and stretches over to form the articular blanket of joints. Endochondral ossification, the process in which bones grow, actually uses a hyaline cartilage intermediate. This is seen in infants all the way up to adolescence. Elastic cartilage contains mostly elastin within its matrix. This stiff but elastic tissue is found mainly in certain regions of the ear and epiglottis. Fibrocartilage has its matrix comprised mostly of a protein called Type I collagen, which provides incredible tensile strength and support. It is most ubiquitous in high and frequent stress areas such as intervertebral discs, the symphysis pubis, and the attachments of certain tendons and ligaments.

How Joint Care Supreme can help

Joint Care Supreme takes the best

ingredients known to help repair, rebuild and reduce pain and inflammation of connective tissue and plugs them into this amazing formula in skillfully crafted amounts to yield the best results for your joints. First and foremost, Joint Care Supreme contains 120mg of Hyaluronic acid. This amazing N-acetylated sugar is an asulfated glycosaminoglycan containing repeated hyaluronan monomers and is what neural, epithelial and connective tissues are comprised mainly of. This polysaccharide is found in abundant amounts in the extracellular matrix within connective tissue as well as being what is responsible for making synovial fluid so viscous. Hyaluronic acid is what sheaths chondrocytes within articular cartilage and is what gives cartilage its compresso-resistive properties, when monomeric hyaluronan is bound to two other proteins. What this all means is that hyaluronic acid

is what the synovial goo is comprised of, provides cartilage cells with a protective coat, and sucks up water to give cartilage its stretchy, bendy, twisty, rubber band-like characteristic. Hyaluronic acid is used as treatment for osteoarthritis of the knee, producing an analgesic effect as well as reconstructing and cushioning knee cartilage (Puhl W. et al., 1997). It has also been used as a postoperative treatment in tissue healing (De Andres Santos MI. et al., 1994) as well as using hyaluronic acid as a chaperone (when bound to fibronectin) to migrate cells to wounded tissues (Shu XZ et al., 2004). Talk about a multi tasked sugar! Methylsulfonylmethane (MSM) is an organic, sulfur-containing compound found in certain foods that has had growing popularity and promising therapeutic applications. A kissing cousin to DMSO, MSM is also used as an industrial solvent, however its applications extend far beyond that. Although the exact mechanisms are poorly understood, recent research has found MSM to be an excellent anti-inflammatory (Murav'ev IuV, et al., 1991), as well as enhancing the health effects of DMSO (Kocsis JJ. et al., 1975). Recent clinical trials performed on MSM suggest its benefits for osteoarthritis sufferers (Usha PR. et al., 2004). MSM's safety in its pharmacology and toxicity makes it easy to supplement without the anxiety of taking too much, with its 2g/kg body weight upper dosage with no adverse effects (Horváth K. et al., 2002). The ever so popular amino sugar, glucosamine is one of the most abundant monosaccharides in our bodies. It is prepared by the digestion of the exoskeletons of crustaceans and put into tablet or capsule form as sulfate or hydrochloride. The mechanisms of action of glucosamine have astounded scientists and have given rise to a wonderful array of different applications, most notably osteoarthritis. Glucosamine's benefits in osteoarthritis include, but are not limited to, its anti-inflammatory properties (Largo R, et al., 2003), propagation of proteoglycan synthesis (Bassler C., et al., 1998), and catabolic decrease in chondrocyte activity, inhibiting proteolytic enzyme synthesis causing damage to cartilage matrix and causing death of articular chondrocytes (Dodge GR, et al., 2003, Chan PS, et al., 2005). And what joint support supplement would be complete without the infamous Chondroitin sulfate. This long-chained glycosaminoglycan is a crucial structural supporting factor of cartilage and contributes to cartilage's resistance to

compression and stress. When combined with glucosamine, the two form a powerhouse team in combating osteoarthritis. Supplemental chondroitin, usually from bovine or porcine sources, has demonstrated outstanding results for the treatment of osteoarthritis (Jordan KM. et al., 2003). In fact, in Europe it is used as an approved drug with evidence of its efficacy and safety backed by clinical trials for the successful treatment of osteoarthritis (Vergés J. et al., 2004). Shark cartilage is the strong, sturdy material that the skeleton of sharks is comprised of. Besides its composition of glycosaminoglycans, amino sugars involved in connective tissue rebuilding, and being one of the sources of commercially prepared chondroitin sulfate, there is a recent rise in studies that suggest its role in preventing certain cancers. One such study postulates shark cartilage having inhibitory effects on endothelial cell angiogenesis, metastasis, cell adhesion and MMP (matrix metalloprotease) activity (Bargahi A. et al., 2008). Joint Care Supreme puts the icing on the cake with the addition of vitamin C to its formula. Vitamin C (the L-enantiomer of ascorbic acid), has been strategically placed into the Joint Care Supreme formula due to two of its physiological benefits in tissue protection and repair. First, it is a well known and powerful anti-oxidant, thus preventing oxidative damage to cartilage matrices. Second, collagen cannot be synthesized in humans without vitamin C. It is the cofactor of the two crucial enzymes procollagen-lysine 5-dioxygenase, and procollagen-proline dioxygenase, which forms hydroxylysine and hydroxyproline, the two agents that allow crosslinking within collagen. There is also evidence of vitamin C's involvement in the reduction of pain from osteoarthritis (Jensen NH, 2003), possibly due to its role as an inhibitor of proinflammatory prostaglandins (D M Pugh et al., 1975).

Purpose

Viva Vitamins has created Joint Care Supreme with the assumption that over time or due to physical injury connective tissue degradation ensues. Although there is no magic pill that will give you the joints of a twelve year old again, science has caught up with the times to offer helpful hints on how to nourish the very cells that produce the connective tissues in our joints to drastically reduce the rate of that degradation. Researchers at Viva Vitamins have utilized the latest scientific research to create a cartilage-preserving dynamo called Joint Care Supreme.

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