



# Osteoarthritis Relief

## *Glucosamine, Chondroitin & MSM*

©2009 Huntington College of Health Sciences

Literature Education Series On Dietary Supplements

By Gene Bruno, MS, MHS – Dean of Academics, Huntington College of Health Sciences

*Smart Supplementation™ is a free series of educational literature created by Huntington College of Health Sciences (HCHS) as a public service. Although copyrighted, it may be freely photocopied and distributed, but may not be altered in any way. Smart Supplementation™ is not intended as medical advice. For diagnosis and treatment of any medical condition, consult your physician.*

According to the American College of Rheumatology, osteoarthritis (OA) is the most common form of arthritis (affecting more than 21 million Americans). It most often affects middle-aged and older people, involving the neck, lower back, knees, hips and fingers. Nearly 70 percent of people over the age of 70 have x-ray evidence of the disease, but only half of these people ever develop symptoms. It may also occur in joints that have suffered previous injury, been subjected to prolonged heavy use, or damaged by prior infection or inflammatory arthritis. Patients with OA experience pain and loss of function. OA results from degeneration of the joint cartilage. The causes of cartilage loss are multiple. Some kinds of OA are known to be hereditary, including the common form that causes enlargement of the knuckles. In most people, cartilage breakdown is due to both mechanical ("wear and tear") effects and biochemical effects.

In either case, supplementation with key natural ingredients may help the situation—often significantly. Following is a discussion of three such natural ingredients: glucosamine sulfate, chondroitin sulfate and MSM.

### **Glucosamine sulfate**

According to the book, *The Arthritis Cure*, there are three requirements to keep cartilage healthy: water for lubrication and nourishment,

proteoglycans to attract and hold the water, and collagen to keep the proteoglycans in place. Proteoglycans are large molecules made of protein and sugar. They trap water like a sponge and make cartilage resilient.<sup>1</sup> Glucosamine sulfate figures into healthy cartilage since it is a major building block of the water-loving proteoglycans. In addition, glucosamine sulfate's very presence stimulates the production of more proteoglycans. The fact that glucosamine sulfate increases the synthesis of these key elements of cartilage means that it actually helps repair damaged or eroded cartilage.<sup>2</sup> In fact, for many years glucosamine sulfate has been successfully used in the therapy of osteoarthritis, and has met all standards of an efficient and well tolerated drug (albeit a natural drug). This has been demonstrated by experimental as well as clinical studies, in which glucosamine sulfate led to long-lasting pain reduction and functional improvement.<sup>3</sup> In addition, several studies have shown that besides stimulating the production of cartilage, glucosamine sulfate helps to reduce the pain and improve joint function by more than 50% in those with osteoarthritis.<sup>4,5</sup> In one large-scale study of 1,208 patients supplemented with glucosamine sulfate, pain improved steadily throughout the treatment, and 95% of the patients enjoyed a positive response. Glucosamine sulfate even continued to work 6-12 weeks *after* the treatment had stopped.<sup>6</sup> Other studies have shown that glucosamine sulfate is even more effective at treating arthritic pain than ibuprofen (also known by the brand names Advil, Motrin, Nuprin, etc.).<sup>7</sup>

### **Chondroitin sulfate**

Chondroitin sulfate is the perfect complement to glucosamine sulfate since chondroitin acts like a liquid magnet, attracting fluid into the proteoglycans. This fluid acts as a shock

absorber and also brings nutrients with it into the cartilage. Perhaps of greater significance than its fluid-enhancing properties, chondroitin sulfate protects existing cartilage from premature breakdown by inhibiting certain cartilage-chewing enzymes. Furthermore, like glucosamine, chondroitin stimulates the production of proteoglycans and collagen that are needed for healthy new cartilage. As a matter of fact, chondroitin works synergistically with glucosamine.<sup>8</sup> Research on chondroitin sulfate has demonstrated that it too is effective in the treatment of osteoarthritis. Studies were conducted in several different countries, but the results were always the same: patients treated with chondroitin sulfate experienced significant relief of pain, and enjoyed increased mobility.<sup>9</sup>

10 11 12

### MSM

Methylsulfonylmethane (MSM), a naturally occurring, sulfur containing compound, is naturally present in body fluids and tissues and is found in milk and a variety of fruits, vegetables, and grains (in small amounts). At low levels of ingestion, it functions as a normal dietary ingredient and assimilable source of essential dietary sulfur. At higher levels it functions as a pharmaceutically active agent which can be used safely and effectively for a variety of purposes.

One such purpose, is arthritis. Animal research has shown that joints affected by OA have lower sulfur content.<sup>13</sup> In an animal study, the effect of prolonged oral administration of MSM was examined in relation to the development of spontaneous arthritis. It was found that MSM was capable of lessening the destructive changes in the joints.<sup>14</sup> In addition, a preliminary double-blind trial in people with OA found that daily supplementation with MSM reduced pain after six weeks.<sup>15</sup>

These benefits may be a function of MSM's antioxidant properties. The rationale for this relationship is that free radicals can perpetuate the degeneration of the joint in arthritis, while antioxidants may inhibit this process.

### References

- <sup>1</sup> Theodosakis, J., et al, *The Arthritis Cure*, (1997) St. Martin's Press: New York, 203 pgs.
- <sup>2</sup> Theodosakis, J., *ibid*.
- <sup>3</sup> Anonymous, *Fortschr Med Suppl* (1998) 183:1-12.
- <sup>4</sup> da Camara CC, Dowless GV, *Ann Pharmacother* (1998) 32 (5):580-7.

<sup>5</sup> Hehne HJ, Blasius K, Ernst HU, *Fortschr Med* (1984) 102(24):676-82.

<sup>6</sup> Tapadinhas, M., et al, *Pharmatherapeutica* (1982) 3(3) p 157-68

<sup>7</sup> Theodosakis, J., *ibid*.

<sup>8</sup> Theodosakis, J., *ibid*.

<sup>9</sup> Pipitone VR, *Drugs Exp Clin Res* (1991) 17(1):3-7.

<sup>10</sup> Rovetta G, *Drugs Exp Clin Res* (1991) 17(1):53-7.

<sup>11</sup> Oliviero U, et al, *Drugs Exp Clin Res* (1991) 17(1):45-51.

<sup>12</sup> Mazieres B, et al, *Rev Rhum Mal Osteoartic* (1992) 59(7-8):466-72.

<sup>13</sup> Rizzo R, Grandolfo M, Godeas C, et al. Calcium, sulfur, and zinc distribution in normal and arthritic articular equine cartilage: a synchrotron radiation-induced X-ray emission (SRIXE) study. *J Exp Zool* 1995; 273:82-6.

<sup>14</sup> Murav'ev IuV, Venikova MS, Pleskovskaia GN, et al. Effect of dimethyl sulfoxide and dimethyl sulfone on a destructive process in the joints of mice with spontaneous arthritis. *Patol Fiziol Eksp Ter* 1991; 2:37-9.

<sup>15</sup> Lawrence RM. Methylsulfonylmethane (MSM): a double-blind study of its use in degenerative arthritis. *Int J of Anti-Aging Med* 1998; 1:50.



For more than two decades, Huntington College of Health Sciences (HCHS) has offered more than a conventional undergraduate or graduate education. Our accredited\*, distance learning degrees and diploma programs also include the breadth of responsible complementary and alternative medicine viewpoints, providing our students with a well-rounded and comprehensive approach to nutrition and the health sciences:

- Master of Science in Nutrition
- Bachelor of Health Science in Nutrition
- Associate of Science in Applied Nutrition
- Diploma in Comprehensive Nutrition
- Diploma in Dietary Supplement Science
- Diploma in Sports Nutrition
- Diploma in Women's Nutrition
- Diploma in Natural Sciences
- Diploma in Small Business Management

1204D Kenesaw  
Knoxville, TN 37919  
865-524-8079 • 800-290-4226  
E-Mail: [studentservices@hchs.edu](mailto:studentservices@hchs.edu)  
[www.hchs.edu.com](http://www.hchs.edu.com)

\*Accredited member Distance Education & Training Council.