Glucosamine and Chondroitin Sulfate

1. What are Glucosamine and Chondroitin Sulfate?

Glucosamine and chondroitin sulfate are substances found naturally in the body. Glucosamine is a form of amino sugar that is believed to play a role in cartilage formation and repair. Chondroitin sulfate is part of a large protein molecule (proteoglycan) that gives cartilage elasticity.

Both glucosamine and chondroitin sulfate are sold as dietary or nutritional supplements. They are extracted from animal tissue: glucosamine from crab, lobster or shrimp shells; and chondroitin sulfate from animal cartilage, such as tracheas or shark cartilage.

2. What do they do?

Past studies show that some people with mild to moderate osteoarthritis (OA) taking either glucosamine or chondroitin sulfate reported pain relief at a level similar to that of nonsteroidal anti-inflammatory drugs (NSAIDs) such as aspirin and ibuprofen. Some research indicates that the supplements might also slow cartilage damage in people with OA. Definitive results about the effects of these supplements are expected from an in-depth clinical study currently being conducted by the National Institutes of Health.
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3. What do I look for?

Because dietary supplements are unregulated, the quality and content may vary widely. If you decide to take these supplements:

- Choose products sold by large, well-established companies that can be held accountable.
- Read the product labels carefully to make sure the ingredient lists make sense to you. If you have trouble, ask your pharmacists for help.
- Be sure to consult your doctor before deciding to try these supplements.
- Make sure that OA is the cause of your pain.
- Do not stop or reduce your current prescribed medications without talking with your doctor.

Recommended doses should cost about $1 to $3 per day, but most insurance companies do not cover this cost.

4. How do I take them?

If you decide to take these supplements, consult your doctor about the proper dosage. The amount used in studies of glucosamine was 1,500 mg per day and in studies of chondroitin sulfate, 1,200 mg per day was used.

You can try the supplements along with your current medications for six to eight weeks. If you don't experience any difference in your symptoms within a few months, you probably will not get any relief from using the supplements.

5. Are there side effects?

The most common side effects are increased intestinal gas and softened stools. If you experience these problems, you might want to try another supplement brand before you stop using them altogether.

More studies need to be done to confirm the safety and effectiveness of the supplements. Be sure to contact your doctor if you notice any unusual or new symptoms while you are taking them.
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6. Cautions

- Children, women who are pregnant, and women who could become pregnant should not take these supplements. They have not been studied long enough to determine their effects on a child or on a developing fetus.
- Because glucosamine is an amino sugar, people with diabetes should check their blood sugar levels more frequently when taking this supplement.
- If you are taking chondroitin sulfate in addition to a blood-thinning medication or daily aspirin therapy, have your blood clotting time checked more often. This supplement is similar in structure to the blood-thinning drug heparin, and the combination may cause bleeding in some people.
- If you are allergic to shellfish, consult your doctor before deciding to take glucosamine. In most cases, however, allergies are caused by proteins in shellfish, not chitin, a carbohydrate from which glucosamine is extracted.

This information was excerpted from the Arthritis Foundation brochure Glucosamine and Chondroitin Sulfate.

This document is general information meant to supply information on Glucosamine / Chondroitin. Please research and clear it with your doctor before starting supplementation.

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# Info on MSM

- **Methylsulfonylmethane** -

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<th>Description</th>
<th>Methylsulfonylmethane (MSM) is a metabolite of dimethylsulfoxide (DMSO). DMSO is a well-known solvent which is often used topically for its analgesic (pain-killing) and anti-inflammatory properties. The role of MSM as a dietary supplement is as a sulfur donor.</th>
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| Claims      | Relief of arthritis pain and stiffness  
Increases growth hormone synthesis  
Stimulation of immune function  
Support of connective tissue integrity (hair, nails, skin) |
| Theory      | MSM, which is about one-third sulfur, acts as a dietary source of sulfur. Sulfur is involved in a wide variety of metabolic pathways and plays an important structural role in amino acid and protein metabolism. Sulfur is required for proper synthesis and maintenance of connective tissues such as skin, hair, nails, tendons, and cartilage. Many supplements claim MSM to be a dietary treatment for osteoarthritis based on the presence of sulfur in connective tissues such as collagen (collagen comprises nearly three quarters of the solid portion of cartilage). |
| Scientific Support | Despite the wide range of anecdotal reports of MSM effectiveness, there is little compelling scientific evidence supporting such claims – particularly for osteoarthritis. Several small animal studies have suggested that MSM may play a role in resistance to stress and stimulation of immune system responses. Doses in the range of 1-5mg/kg/d (approximately 70-350mg for an average-sized man) over a period of 2-4 weeks appear to stimulate synthesis of immunoglobulins (in mice and chickens). In horses, larger doses (2.5-10 grams per day) have been associated with improvements in hoof quality. |
| Safety      | The best news about MSM is that it can be considered very safe (though not very effective) when used as a dietary supplement. In rats and dogs, toxic effects are reported only for extremely high doses – which would correspond to well over 200 grams per day for an average-sized man (about 8 ounces of the stuff!). |
As a dietary sulfur source (its only valid benefit) MSM would appear to be an overpriced supplement option. There are a number of other less expensive, yet equally effective dietary sources of sulfur, including eggs, meat and fish – as well as sulfur containing amino acids such as methionine and cystine/cysteine. Large doses of methionine, however, should also be accompanied by supplemental levels of key B vitamins such as folic acid, B6 and B12 – which are known to reduce homocysteine levels (homocysteine is a metabolite of methionine and high levels have been associated with an increased risk for cardiovascular disease).

Dosage

Typical dosage recommendations range from 2-5 grams per day as a beginning or "loading" dose to about 50-200mg per day for maintenance. Due to the lack of strong scientific efficacy, however, MSM is not recommended as a particularly effective dietary supplement for joint health.

References