

# **GLUCOSAMINE, CHONDROITIN, AND MSM**

**Compiled by**

**Campbell M Gold**

**(2009)**

(This material was compiled from various unverified sources)

CMG Archives  
<http://campbellmgold.com>

--()--

## **IMPORTANT**

**The health information contained herein is not meant as a substitute for advice from your physician, or other health professional. The following material is intended for general interest only; and it should not be used to diagnose, treat, or cure any condition whatever. If you are concerned about any health issue, symptom, or other indication, you should consult your regular physician, or other health professional. Consequently, the Author cannot accept responsibility for any individual who misuses the information contained in this material. Thus, the reader is solely responsible for all of the health information contained herein. However, every effort is made to ensure that the information in this material is accurate; but, the Author is not liable for any errors in content or presentation, which may appear herein.**

--()--

## **Glucosamine**

### **What types of Glucosamine are there?**

Glucosamine is available as glucosamine sulphate (glucosamine sulphate in the USA) or glucosamine hydrochloride. Almost all of the studies done with glucosamine have used the sulphate, however the hydrochloride form has been used for many years and it seems to work just as well. The hydrochloride form is cheaper. It is available in liquid and tablet form. Vegetarian glucosamine is also available.

### **Dosage**

The maximum recommended dose is 1500 mg per day. This can be taken as a single dose or divided into 500 mg three times a day.

### **How does Glucosamine work?**

- Cartilage contains compounds called proteoglycans and glycosaminoglycans (GAG's) contained within a collagen matrix. GAG's and proteoglycans form long chains and lattices to which the collagen adheres.
- Glucosamine is the major building block by which the body manufactures proteoglycans and GAG's, and the supply of glucosamine is the rate limiting step in the manufacturing process.
- Cartilage and other related structures like discs, tendons and ligaments are continuously being remodelled in health, being worn away during activity and then reformed again afterwards.

- Low levels of glucosamine can be associated with delayed repair to cartilage and these other related tissues.
- Taking glucosamine supplements can boost GAG and proteoglycan levels by up to 170%, thereby facilitating the repair process.

### **Can Glucosamine be combined with anything else?**

- If glucosamine itself is not helpful in relieving arthritic symptoms, it may be combined with chondroitin, and other nutrients. Alternatively, glucosamine and chondroitin can be started together. The positive effect of glucosamine reducing joint pain is often apparent within a few weeks.
- Glucosamine may be taken together with paracetamol and NSAIDs such as ibuprofen. However, once glucosamine starts working, the dose of such drugs can be reduced or eliminated.

### **Does Glucosamine interact with allopathic medicines?**

- There are reports indicating glucosamine interacting with prescribed diuretics (water tablets) such that a higher dose of diuretic is required to achieve a normal therapeutic effect.
- NOTE: Be sure to consult your health care professional before trying any nutritional supplement. Do not stop or reduce any prescribed medications without consulting your health care professional.

### **Is it possible to be allergic to Glucosamine products?**

- Glucosamine is typically derived from shrimp and crab shells and chondroitin is derived from the cartilage of cows, pigs, and sharks. Individuals allergic to these types of sources may find they are allergic to glucosamine products.
- Glucosamine, derived from corn, is suitable for Vegans, and should be available from good health stores.

### **Are there any long term safety concerns with glucosamine?**

- Based on current research, glucosamine can be taken for extended periods, months and years, etc. Thus far, after being in use for a number of years, there have not been any reports in medical reports of any significant side effects resulting from the use of glucosamine.
- Regarding changes to blood sugar, there is no significant changes with the use of glucosamine. The glucosamine dose of one or two grams a day, is minimal as a sugar source compared to the amounts of glucose and other simple carbohydrates found in the typical foods consumed by the individual.
- It is best pregnant women not take glucosamine until more is known about this interaction.

### **Which conditions may benefit from Glucosamine?**

- There is evidence that those with musculo-skeletal injuries may benefit from glucosamine supplements, which will aid in tissue healing.
- There is anecdotal evidence that people with osteoarthritis (mild to moderate) may benefit from taking glucosamine supplements.
- However, there is no evidence to suggest that individuals with autoimmune disorders such as lupus (SLE) and rheumatoid arthritis will derive any benefit from it Glucosamine.
- Glucosamine combined with chondroitin and other vitamin supplements has also been found to be useful in maintaining joint health in dogs.

--()--

## Chondroitin

### What is Chondroitin Sulphate?

- Chondroitin sulphate belongs to a family of complex polysaccharides called glycosaminoglycans (GAGs). Chondroitin sulphate consists of a long chain of repeating units of disaccharides called chondrosines. These chondrosines are composed of D-glucuronic acid and D-Galactosamine.
- Depending on where these chondrosine units bind to each other determines the kind of chondroitin. Chondroitin sulphate A (also called chondroitin 4-sulfate) is the most numerous and chondroitin sulphate C (chondroitin 6-sulfate).
- Depending on how the chondroitin sulphate is prepared, there can be anywhere from 15 to 150 of these repeating chondrosine units. The commercially available chondroitin products are a mixture of chondroitin A and C.

### What is its action in the body?

- Chondroitin sulphate molecules join with proteins to become proteoglycans. These proteoglycans comprise the ground substance in the extracellular matrix of connective tissue (cartilage, tendons, ligaments, etc.).

### How does it work?

- Oral chondroitin sulphate may help maintain and repair the structure and function of cartilage. In addition, it appears to reduce pain and inflammation.
- The exact mechanism of action has yet to be clarified. It does appear, however, that a significant increase in hyaluronic acid occurs after taking oral chondroitin sulphate. Hyaluronic acid is a major component of synovial fluid which is the lubricating fluid in joints. This alone should improve joint lubrication, reduce pain, and improve mobility.
- Additionally, it is well known that chondroitin sulphate and hyaluronic acid are fundamental components of articular cartilage that provides shock-absorbing qualities. Recent clinical studies seem to verify the positive role oral chondroitin can have on joint health.
- It normally takes one to two months for symptoms improve.

### Dose?

- The typical dose of Chondroitin sulphate is 1200 milligrams in divided doses. Glucosamine sulphate is 1500 milligrams in divided doses.
- NOTE: Be sure to consult your health care professional before trying any nutritional supplement. Do not stop or reduce any prescribed medications without consulting your health care professional.

### What is its source?

- The major source of chondroitin sulphate commercially is from the cartilaginous rings of bovine trachea (the windpipe in cattle). Another, rather expensive source is shark cartilage.

### What are its indications?

- Chondroitin sulphate may be indicated for the prevention and treatment of osteoarthritis. It may be used by itself or in combination with glucosamine.
- Chondroitin has also been found to be useful in maintaining joint health in dogs

**Does it have any interactions?**

- Chondroitin may form a complex with Chitosan (weight loss treatment), thereby reducing the absorption of chondroitin.

**Are there any precautions?**

- Side effects are rare and mostly of a mild gastrointestinal variety.
- As a result of insufficient data, children, pregnant women, and nursing mothers should avoid chondroitin sulphate.
- Because chondroitin may have antithrombotic activity, those individuals taking anti-coagulants or those with haemophilia should exercise caution.
- Although allergic reactions have not been reported with chondroitin, if an individual experiences symptoms such as a rash, hives, or shortness of breath, they should immediately stop taking the supplement and call their health care professional.

--()--

## MSM

### What is MSM?

- MSM (Methyl sulphonyl methane) is also known as dimethyl sulphone, sulphonylbismethane, methyl sulphone, and DMSO<sub>2</sub>. It is derived from DMSO (dimethyl sulphoxide). MSM is a natural sulphur compound and is an excellent source of bio-available sulphur. Sulphur is a mineral that is essential to the normal structure and function of the body. Sulphur is an essential raw material of protein, especially connective tissue proteins like collagen. A normal adult has about 2 kg of sulphur as body weight.

### Why is MSM important?

- Sulphur is lost from food when it is processed, dried, cooked or preserved. Therefore, MSM serves as an important source of bio-available sulphur. This is critical since sulphur is essential for healthy connective tissue, joint function, proper enzyme activity, hormone balance, and proper function of the immune system.
- Research seems to suggest that MSM is helpful in improving joint flexibility, reducing stiffness and swelling, and reducing pain. MSM may also play a role in improving circulation, cell vitality, softening and reducing scar tissue, and in breaking up calcium deposits.
- MSM is an odourless, water-soluble, white crystalline material that supplies a bio-available form of dietary sulphur. At the molecular level, sulphur is responsible for the flexible bond between cells, including those that make up the skin. It acts to block undesirable chemical and physical cross-linking or bonding of collagen which is associated with tough, aging skin. Approximately half of the total body sulphur is concentrated in the body's muscles, skin, and bones. Sulphur is an important component of keratin, the tough substance in the skin, nails and hair. Most importantly, sulphur is necessary for making collagen, the primary constituent of connective tissue and an important part of cartilage. Sulphur is responsible for maintaining the integrity of the collagen protein molecule through the formation of disulfide bonds.
- The body is constantly producing new cells and connective tissue 24 hours a day. Therefore, there is an ever present need for sulphur and all the other essential nutrients. Tests conducted with laboratory animals indicated that wound healing occurred faster with a group receiving MSM, but even faster with both MSM and vitamin C supplementation. The common signs of sulphur deficiency include slow wound healing, tough scar tissue, brittle hair or nails, gastrointestinal problems, arthritis, acne, depression, and more. Since the body is in a constant state of repair, it must have all of the basic raw materials to avoid producing dysfunctional cells.
- MSM is non-allergenic, non-pyretic (does not induce fever), and has no interfering or undesirable pharmacological effects. There are no known reports of overdose with MSM. It is thought the body will use what it needs and flush out the rest without harm. MSM is not a vitamin or a drug.

### How does it work?

- The mode of action for MSM has not been proven. In a double-blind study of MSM's impact on degenerative arthritis, researchers found that individuals who ingested 2,250mg of MSM daily for six weeks felt an improvement in their pain reduction by 82 percent, on average.
- Researchers are not sure if MSM is effective in arthritis because of its sulphur content, its anti-inflammatory and analgesic properties, a combination of these, or because of some yet-undiscovered mechanism. MSM may take 2 - 4 weeks before a significant improvement is noted.

**What are the safety aspects?**

- Individuals who have received oral MSM, as part of their treatment, have shown no toxic build-up, even after years of ingesting more than 2,000mg of MSM daily. It appears that the body uses what it requires, and then simply flushes out the rest within 12 hours.

**What is the normal dose?**

- Doses used are typically 1 to 3 grams per day, with 2 grams being the most common.
- NOTE: Be sure to consult your health care professional before trying any nutritional supplement. Do not stop or reduce any prescribed medications without consulting your health care professional.

**Are there any precautions?**

- Side effects are rare, but have been known to include nausea, diarrhoea, and headache.
- In consequence of insufficient data, pregnant and nursing mothers should avoid MSM.
- Although allergic reactions have not been reported with MSM, if an individual experiences symptoms such as a rash, hives, or shortness of breath, they should immediately stop taking the supplement and call their health care professional.

End

--()--

<http://campbellmgold.com>

16072009/1