

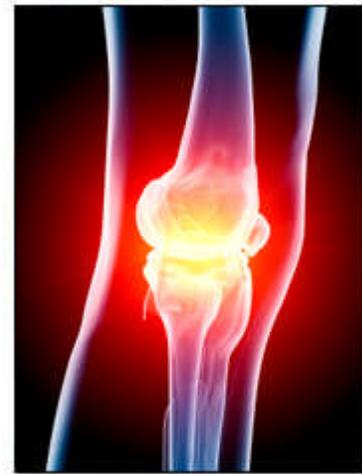


Glucosamine

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Dear Health Enthusiast:

An estimated 27 million adults in the United States live with osteoarthritis—the most common type of arthritis. Osteoarthritis, also called degenerative joint disease, is caused by the breakdown of cartilage, which is the connective tissue that cushions the ends of bones within the joint. Osteoarthritis is characterized by pain, joint damage, and limited motion. The disease generally occurs late in life, and most commonly affects the hands and large weight-bearing joints, such as the knees. Age, female gender, and obesity are risk factors for this condition.



Glucosamine is a compound that has been heavily touted recently as the "cure" for osteoarthritis. The fact is there is no cure for osteoarthritis. However, recent scientific studies have shown that glucosamine has been able to assist in rebuilding cartilage, slow the progression of osteoarthritis, and ease pain without the side effects of COX-2 inhibitors or NSAIDs.

Glucosamine sulfate is a chemical found in the human body. The body uses it to produce a variety of other chemicals that are involved in building tendons, ligaments, cartilage, and the thick fluid that surrounds joints. The fluid and cartilage that surround them cushion joints. In some people with osteoarthritis, the cartilage breaks down and becomes thin. This results in more joint friction, pain, and stiffness. Researchers think that taking glucosamine supplements may either increase the cartilage and fluid surrounding joints or help prevent breakdown of these substances, or maybe both.

Most research on glucosamine has measured its effectiveness on osteoarthritis of the knee. However, there is some evidence that it might also help osteoarthritis of the hip or spine. Some research suggests that glucosamine reduces pain of osteoarthritis in the knee about as well as the over-the-counter pain reliever acetaminophen (Tylenol). It also seems to reduce pain about as much as the nonsteroidal anti-inflammatory drugs (NSAIDs) ibuprofen (Motrin, Advil) and piroxicam (Feldene). But there is a difference between glucosamine and these drugs in the time it takes to reduce pain. The NSAIDs, such as Motrin, Advil, and Feldene, relieve

symptoms and reduce pain usually within about 2 weeks, but the glucosamine takes about 4-8 weeks.

In addition to relieving pain, glucosamine might also slow the breakdown of joints in people with osteoarthritis who take it long-term. Some researchers hope that glucosamine might keep osteoarthritis from getting worse as quickly as it otherwise might. There is some evidence that people who take glucosamine might be less likely to need total knee replacement surgery. Glucosamine is also possibly effective for temporomandibular joint (TMJ) arthritis. TMJ is the joint in the jaw that dentists often check for clicking and proper alignment. It can be a factor related to jaw pain, chewing, yawning, and talking. Some research shows that taking glucosamine works about as well as the nonsteroidal anti-inflammatory drug (NSAID) ibuprofen (Motrin, Advil, etc) for relieving jaw pain. In some people, pain relief appears to continue for up to 90 days after glucosamine is discontinued.



Glucosamine ($C_6H_{13}NO_5$) is an amino sugar and a prominent precursor in the biochemical synthesis of glycosylated proteins and lipids. Glucosamine is part of the structure of the polysaccharides chitosan and chitin, which compose the exoskeletons of crustaceans and other arthropods, cell walls in fungi and many higher organisms. Glucosamine is one of the most abundant monosaccharides. It is produced commercially by the hydrolysis of crustacean exoskeletons or, less commonly by fermentation of a grain such as corn or wheat. In the US it is one of the most common non-vitamin, non-mineral, dietary supplements used by adults.

Multiple clinical trials in the 1980s and 1990s, all sponsored by the European patent-holder, Rottapharm, demonstrated a benefit for glucosamine. The latter trials sponsored by Rottapharm were two large (at least 100 patients per group), three-year-long, placebo-controlled clinical trials of the Rottapharm brand of glucosamine sulfate. These studies both demonstrated a clear benefit for glucosamine treatment. There was not only an improvement in symptoms but also an improvement in joint space narrowing on radiographs. This suggested that glucosamine, unlike pain relievers such as NSAIDs, can actually help prevent the destruction of cartilage that is the hallmark of osteoarthritis.

This situation led the National Institute of Health (NIH) in the U.S.A. to fund a large, multicenter clinical trial (the GAIT trial. In GAIT, participants were randomly assigned to one of five treatment groups: (1) glucosamine alone, (2) chondroitin sulfate alone, (3) glucosamine and chondroitin sulfate in combination, (4) celecoxib, or (5) a placebo (an inactive substance that looks like the study substance).

In this respect, a 6-month double-blind, multicenter trial has been recently performed to assess the efficacy of glucosamine sulfate 1500 mg once daily compared to placebo and acetaminophen in patients with osteoarthritis of the knee (GUIDE study). The results showed that glucosamine sulfate improved the Lequesne algofunctional index significantly compared to placebo and the positive control. Secondary analyses, including the OARSI (OsteoArthritis Research Society International) responder indices, were also significantly favorable for

glucosamine sulfate.

Consumers have decided with their wallets choosing to continue to derive benefits from glucosamine and chondroitin supplements, with sales experiencing significant growth over the past decade. Glucosamine is likely safe when used appropriately by adults. Overall, there are very few side effects of glucosamine. Glucosamine is very safe in comparison to the side effects of COX-2 inhibitors.

Pregnancy or breast-feeding: Until more is known, do not take glucosamine while pregnant or breast-feeding.

Diabetes: Monitor blood sugar levels recommended.

Shellfish allergy: Allergic reactions in people with shellfish allergy are typically caused by the meat of shellfish, not the shell. There are no reports of allergic reactions to glucosamine in people who are allergic to shellfish. Because some glucosamine products are made from the shells of shrimp, lobsters or crabs, there is concern that glucosamine products might cause allergic reactions in people who are allergic to shellfish.

Do not take glucosamine in combination with Warfarin (Coumadin) Be cautious in taking glucosamine with medications for cancer (Antimitotic chemotherapy).



Be sure to try NSP's Glucosamine (60 caps), EverFlex® w/Hyaluronic Acid (60 tabs), EverFlex® Pain Cream (2 oz. jar), or MSM/Glucosamine Cream (2 oz. tube).

References:

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