

## Glucosamine

*Lubrication For Healthy Joints*

### What Does Glucosamine Do?

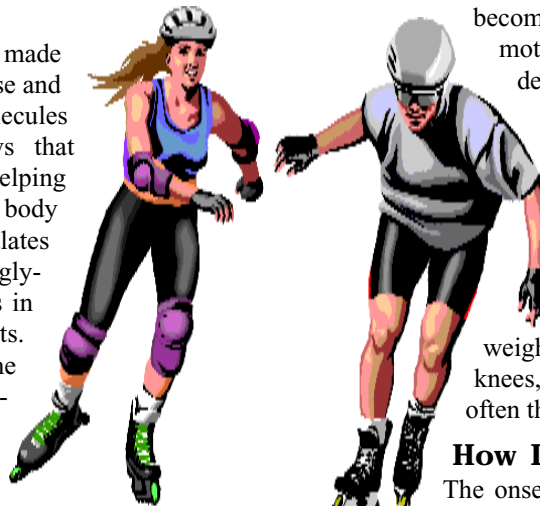
- Gives dramatic help for arthritic pain
- Provides a natural alternative to aspirin and anti-inflammatory drugs
- Stimulates repair in wornout joints
- Helps maintain normal joint function and resiliency

### Get The Best Glucosamine

- The best form of glucosamine  
*Glucosamine sulfate, NOT hydrochloride*
- A generous amount per capsule  
*750 mg per capsule, not smaller amounts*
- In 100% pure vegetable capsules  
*Avoid tablets and their unlisted toxic glues and binders.*

### What Is Glucosamine?

Glucosamine is a natural molecule made by the body, composed of glucose and an amine (nitrogen and two molecules of hydrogen). Research shows that glucosamine plays a key role in helping to keep all the joints the body lubricated and supple. It stimulates the manufacture of glycosaminoglycans, key structural components in cartilage which line the joints. Glucosamine also promotes the incorporation of sulfur into cartilage. Because of this effect, research shows that glucosamine sulfate is the most effective form.



become very painful with limited range of motion and in time, they may become deformed.

### Who Gets Joint Disease?

Over 40 million Americans have degenerative joint disease, including 80% of people over age 50. Under age 45, degenerative joint disease is more common in men; after age 45, it is ten times more common in women. The weight-bearing joints, such as the hips and knees, as well as the joints of the hands are often the most affected.

### How Does It Start?

The onset of degenerative joint disease can be very subtle. The first symptom may be joint stiffness in the morning. As the joint disease progresses, there is pain on motion of the affected joint that is made worse by prolonged activity and relieved by resting. Inflammation is usually absent or minimal.

### The Glucosamine-Arthritis Connection

As people age, many lose their ability to manufacture sufficient amounts of glucosamine. This may be the major factor leading to the degeneration of the joints, which causes painful joint movement and destruction of the joint's cartilage. Glucosamine's link to the joints led many researchers to wonder what would happen if those with painful joints took glucosamine? The results were astonishing. Oral glucosamine (in the sulfate form) proved to be spectacular help for joint repair and rebuilding.

### Degenerative Joint Disease

As the body ages, it may not produce a sufficient amount of glucosamine. This can result in cartilage that loses its ability to act as a shock absorber in the joints. The joints then become stiff and painful. Every step or joint movement can be an agony. This process is often diagnosed as degenerative joint disease, such as osteoarthritis, the most common form of arthritis. The affected joints show gradual destruction of the joint's cartilage followed by the formation of large, abnormal bone spurs in the joint margins. The joints

### Joint Stress In Athletes

Joint pain and injuries are one of the most common complaints in active people and athletes. Any type of active exercise places stress on joints. When the spine is out of alignment (called a subluxation), the nerves which pass between the individual vertebrae will have less room to carry nerve impulses, and eventually the nerve becomes impinged. This is the point where you feel pain and may go to see a chiropractor for an adjustment.

When injury occurs, the demand for collagen and other joint repair substances increases. Glucosamine is the rate-limiting factor in making many of these connective tissue and joint repair substances. If glucosamine stores are low, the joint repair compounds may not be able to be made. Because of its joint repair benefits, glucosamine sulfate is a favorite nutritional supplement for those who are physically active.

# Glucosamine Sulfate

## Lubrication For Healthy Joints

### Get The Best Form

Glucosamine comes in several forms: glucosamine sulfate, glucosamine hydrochloride and N-acetyl-glucosamine (NAG). Be careful in your selection of a glucosamine supplement: the research showing the excellent joint-improving benefits was with glucosamine sulfate. Glucosamine hydrochloride performed poorly. Some marketing companies have claimed that NAG is better absorbed and more stable, but scientific research does not support this. In fact, an unsuspected problem with NAG has been demonstrated: toxic brain effects. For best results, use a nontoxic grade of glucosamine sulfate.

### Natural Alternative To Aspirin

According to a well-known medical researcher, Dr. Michael Murray, "Glucosamine is a safe and effective natural alternative to aspirin and other nonsteroidal anti-inflammatory drugs." Clinical research shows that drugs currently being used to treat degenerative joint disease such as osteoarthritis may produce short-term relief, but in the long run, they actually accelerate the progression of joint destruction.

### Aspirin: A Gradual Killer

The first drug generally used to treat joint pain such as osteoarthritis is aspirin. Although aspirin can help relieve joint pain and inflammation temporarily in some cases, it often becomes toxic in therapeutic doses (2 to 4 grams per day). Early signs of aspirin toxicity are tinnitus (ringing in the ears) and stomach irritation. Long-term use of aspirin has been shown to cause the weakening of the walls of arteries and capillaries; many researchers believe this increased blood vessel fragility can help promote the onset of a stroke (breaking of a blood vessel in the brain) which may have disastrous consequences.

### Aspirin: The Leaky Gut Connection

Long-term use of aspirin also promotes "leaky gut" syndrome, in which the intestinal lining becomes too permeable, allowing large, only partially digested molecules to pass through the gut into the blood stream. These abnormal proteins can then migrate to other areas of the body and produce many other symptoms such as allergies, digestion problems, brain disorders, headaches, and many other types of pain. For many, these new symptoms brought on by the "leaky gut" proteins, will be far worse than their original joint pain.

Other nonsteroidal anti-inflammatory drugs (NSAIDs) are often used to control joint pain, especially if aspirin is ineffective. Drugs frequently used to control pain in joint disease are ibuprofen (Advil, Motrin, Nuprin), fenoprofen (Nalfon), indomethacin (Indocin), naproxen (Naprosyn), tolmetin (Tolectin), and sulindac (Clinoril). NSAIDs can have serious side effects that include gastrointestinal upset, headaches, and dizziness. Because of their side effects, NSAIDs are recommended only for a short period of time, but in real life, the pain drives many people to continue taking them. Long term use of NSAIDs can cause "leaky gut" syndrome, which can lead to a disease far worse than the original joint pain.

### NSAIDs: Increased Joint Destruction

A serious side effect of aspirin and NSAIDs is that they can increase the inhibition of cartilage repair and accelerate cartilage destruction. Although aspirin and NSAIDs may initially help control joint pain,

later they may worsen the individual's joint condition since these drugs inhibit cartilage formation and accelerate cartilage destruction. Clinical studies have shown that the use of NSAIDs has accelerated joint destruction in osteoarthritis. Many doctors now avoid the use of NSAIDs. In contrast, glucosamine sulfate is nutritional supplement which is safe, effective and has no side effects.

### Clinical Trials with Glucosamine Sulfate

Numerous double-blind studies have shown glucosamine sulfate produces better results than NSAIDs and placebos in controlling pain and inflammation of degenerative joint disease (such as osteoarthritis). The study suggested that to achieve the greatest effectiveness, higher amounts of glucosamine may be required for certain individuals: those who are obese, those who have peptic ulcers and those on diuretics. The study showed that even after the glucosamine was stopped, the people found their joint improvement continued for 6 to 12 weeks. This result indicates that glucosamine may be the most effective taken continuously over long periods of time or in repeated short courses. Since glucosamine is safe and effective, long-term, continuous use is not a problem.

### Straight To The Joints

Glucosamine is highly absorbed by the body. Detailed pharmacokinetic studies in animals and humans show up to 98% of orally administered glucosamine sulfate is absorbed. These studies show that after absorption, glucosamine sulfate is preferentially taken up by the cartilage and other joint structures where it stimulates the body's manufacture of chondroitin sulfate and other mucopolysaccharides.

In human clinical studies, oral intake of glucosamine sulfate of 750 to 1,500 mg. per day showed the reversal process in osteoarthritis of the knee, verified by electron microscopy of biopsies. One of the key effects of glucosamine sulfate is its ability to stimulate the incorporation of sulfur into cartilage.

### No Sulfur Allergy

Some people ask, "If I am allergic to sulfur, can I take glucosamine sulfate?" When people say they are allergic to sulfur, they really mean they are allergic to so-called sulfa drugs or sulfite-containing food additives. It is impossible to be allergic to the mineral, sulfur, since it is an essential mineral required for life. Glucosamine sulfate is extremely well tolerated; no allergic reactions have been reported.

### Good News

Because of the awesome benefits of glucosamine sulfate in helping to stimulate joint repair and to maintain healthy joint function, this is good news for those suffering from joint pain (including osteoarthritis), spinal subluxation, cartilage degeneration, or joint injuries. Glucosamine sulfate is an excellent choice to help prevent joint injury and daily wear-and-tear.

### Recommended Use

For best results, adults typically take 1 to 3 capsules daily (750 mg per capsule).

### References

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- Murray, M. T., *Encyclopedia of Nutritional Supplements*, Prima Publishing, 1997.
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