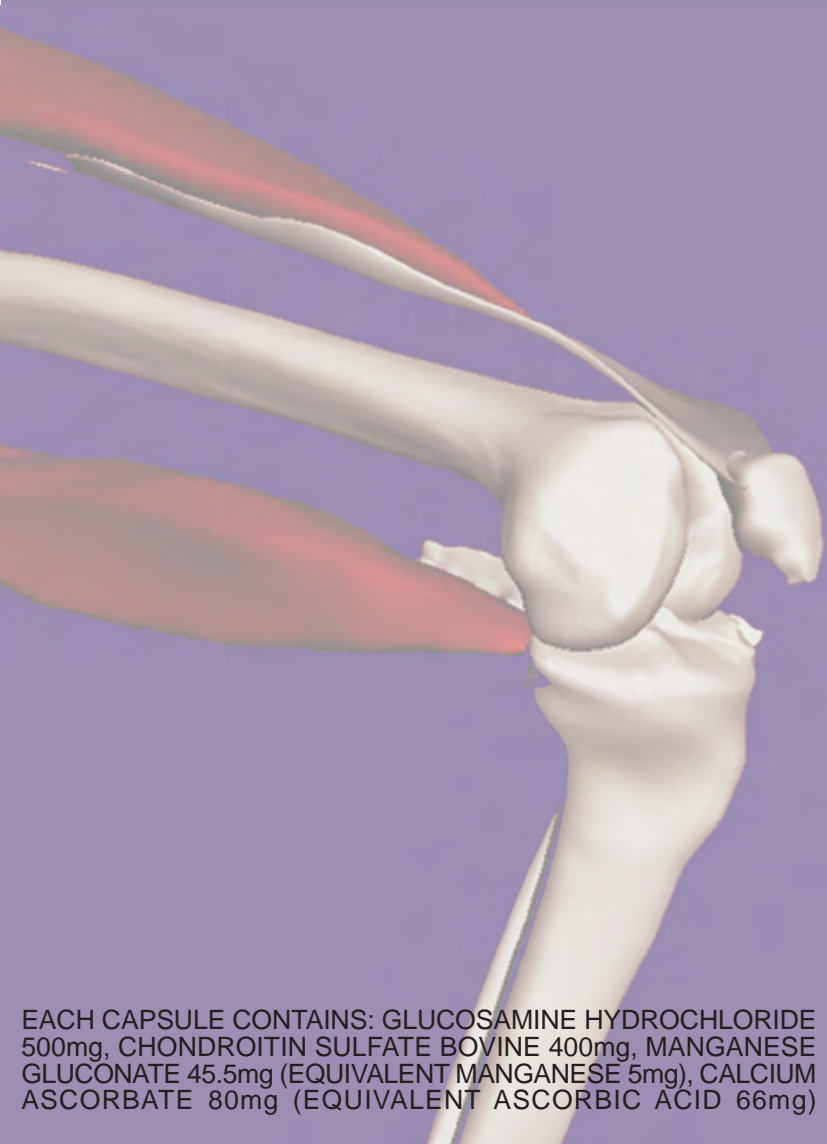


# Double Strength<sup>®</sup> Cosamin<sup>®</sup> DS

PATENTED NUTRACEUTICAL SUPPLEMENT

Frequently Asked Questions



EACH CAPSULE CONTAINS: GLUCOSAMINE HYDROCHLORIDE 500mg, CHONDROITIN SULFATE BOVINE 400mg, MANGANESE GLUCONATE 45.5mg (EQUIVALENT MANGANESE 5mg), CALCIUM ASCORBATE 80mg (EQUIVALENT ASCORBIC ACID 66mg)

## Q What is Cosamin® DS?

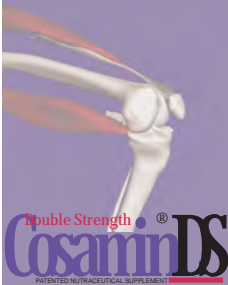
Cosamin® DS is a dual patented formulation combining precise amounts of highly purified glucosamine hydrochloride (500mg), chondroitin sulfate (400mg), and manganese gluconate (45.5mg) in each capsule. Nutramax Laboratories discovered & patented the synergistic effect of the combination of these compounds on cartilage matrix enhancement. The recent surge of interest in cartilage-modifying agents has ensured that many brands of chondroitin sulfate and glucosamine are available in health food stores and other retail outlets, but Cosamin® DS is unique for several reasons.

Firstly, Cosamin® DS is made from a unique, patented formula that combines glucosamine, chondroitin sulfate, and manganese. Taken together, the synergistic combination of glucosamine and chondroitin sulfate with manganese as a cofactor is more beneficial than taking glucosamine or chondroitin alone based on their different mechanisms of action.

Secondly, the ingredients of Cosamin® DS are of unparalleled purity and uniformity and are manufactured and combined according to Good Manufacturing Practices (GMP) standards similar to those used in the pharmaceutical industry. Cosamin® DS combines the safety of a nutritional supplement with the purity and uniformity of a pharmaceutical grade medication, and Cosamin® DS is manufactured in Australia.

## Q What is articular cartilage & why is it important?

Articular cartilage is a firm, resilient, slippery tissue that covers the ends of bones in movable joints. Cartilage is important because its physical characteristics are responsible for much of the shock absorption and lubrication that facilitates normal joint function. Like all tissues, cartilage is made and maintained by specialised cells. The cells that produce and maintain cartilage are called chondrocytes (chondro = cartilage), and they make up only 5% of the total volume of cartilage tissue. The remaining 95% of the volume is made up of an intercellular gel-like matrix composed of protein, water and collagen, and chains of sugar-based molecules called glycosaminoglycans, or GAGs. The chondrocytes produce the matrix, and the matrix, in turn, surrounds and supports the chondrocytes. Because such a large percentage of cartilage is composed of the matrix, normal cartilage structure and function depend to a large extent on matrix integrity.



## Q How does the structure of the cartilage matrix contribute to joint function?

Normal cartilage is resilient, firm, and slippery because of the arrangement of collagen fibres and GAGs in the matrix. These two components bind together, forming a spongy network that combines the water-holding characteristics of the GAGs with the high tensile strength of collagen. When weight is applied to the joint, water is squeezed out of the matrix sponge and into the joint space. When the pressure is released, the GAGs pull water back into the matrix, absorbing as much as their binding with collagen will allow. This sponge-like action of the matrix has several effects: firstly, it is what gives cartilage its resiliency. Secondly, the water extruded from the matrix reduces friction and contributes to joint lubrication. Thirdly, and most importantly, the cycling of water from the matrix again carries nutrients to the chondrocytes and removes waste products from them. This is crucial to cartilage function, because unlike most tissues, cartilage has no internal blood vessels.

## Q What happens when the cartilage matrix breaks down?

A decrease in the number or length of GAG chains has serious effects on the cartilage tissue. One effect is that the reduced chain length leads to reduced binding with collagen. This allows the remaining GAGs to separate more widely and imbibe more water. A second and related effect is that when GAG molecules occupy less of the matrix volume there is more space for water. These two changes result in a softer, more watery matrix, which has less resiliency and less tensile strength. This soft matrix is more easily damaged by normal wear and tear, which leads in turn to a degraded environment for the cartilage cells. The damaged chondrocytes are more likely to produce abnormal GAGs, and so a vicious cycle is established, leading eventually to joint breakdown. Although science does not know exactly what starts matrix breakdown, we do know several

factors that can predispose to it, including wear and tear to cartilage, chronic joint overuse, abnormal loading of joint surfaces, use of steroids and certain non-steroidal antiinflammatory drugs, joint immobilisation, and the aging process.

## Q What are cartilage-modifying agents?

This group of compounds is defined by several characteristics: 1) These compounds either occur naturally in joint tissues, or are structurally similar to compounds occurring naturally in joint tissues 2) These compounds are not only structural building blocks of joint tissue, but also have a recognisable, reproducible effect on the metabolism of joint tissues. They do not mask joint problems, but instead have overall beneficial effects on cartilage, helping to slow the progression of joint cartilage breakdown. Cartilage modifying agents are available in both injectable and oral forms. Examples of oral cartilage modifying agents include glucosamine and chondroitin sulfate. An example of an injectable chondroprotective agent is hyaluronic acid administered directly into the joint by an orthopaedic specialist.

## Q What is glucosamine?

Glucosamine is a small molecule biochemically classed as an amino sugar. In a healthy joint, the cartilage cells normally make glucosamine out of glucose. Glucosamine then, in turn, forms the basic building block of larger molecules in the joint tissues. Joint problems may begin when cartilage cells are not making enough glucosamine to keep up with the level of tissue destruction. Supplying the body with extra glucosamine obviously makes sense. In addition to its structural role, glucosamine directly stimulates cartilage cells, and increases their synthesis of the molecules in the cartilage matrix including hyaluronic acid which is important for synovial fluid to have its lubricating effect. Supplying extra glucosamine to the body thus maximises the production of collagen and GAGs in articular cartilage.

## Q Is there a preferred form of glucosamine?

In order for the body to absorb glucosamine, the compound must be in the form of a salt, that is, it must be bound to another molecule. Forms of glucosamine that have been studied include glucosamine hydrochloride (GluHCl) and glucosamine sulfate (GluSO<sub>4</sub>). Studies have shown that both forms of glucosamine are absorbable. Once the compound has been absorbed, the body breaks off the glucosamine, so the rest of the salt is of little consequence. What this means is that glucosamine HCl and glucosamine SO<sub>4</sub> are both safe and effective. In fact, gram for gram, you get more glucosamine from glucosamine HCl than from glucosamine SO<sub>4</sub>, since HCl is a smaller molecule than sulfate. Another form of glucosamine that is sometimes available is N-acetyl-glucosamine, or NAG. Although NAG is a normal step in the synthesis of cartilage, it has not been shown to be as effective in stimulating cells to make more matrix.

## Q What is chondroitin sulfate?

Chondroitin sulfate also occurs normally in the body, specifically, it is the most abundant GAG in the articular cartilage matrix. A large molecule is made in a series of reactions by the cartilage cells. Chondroitin sulfate is important because it binds to collagen, and thus gives cartilage its tensile strength and resiliency. Lack of chondroitin sulfate contributes to joint breakdown by causing cartilage to become soft. Chondroitin sulfate is certainly an important structural part of cartilage, and it also has an important effect on cartilage metabolism, in that it inhibits degradative enzymes that break down cartilage. In other words, supplementing chondroitin sulfate helps to maintain healthy cartilage by slowing cartilage breakdown.

## Q Are all chondroitin sulfates & glucosamines the same?

No. The purity and grade of these compounds vary widely, depending on how they are produced. In the numerous studies that document the usefulness of chondroitin, and glucosamine as well, only the purest grades of these compounds were used. When compounds of lesser purity and quality are used, it would be expected that efficacy decreases proportionally. Another important point to remember is that dietary supplements are not subject to the government regulation that pharmaceuticals are. Therefore, labelling of these compounds may be inaccurate or misleading. Purchasers of dietary supplements should be careful to buy only from a reputable manufacturer, where quality control programs are used to validate product purity and uniformity, and also subject their brand product to clinical evaluation.

## Q Is chondroitin sulfate absorbed from the digestive tract?

Although chondroitin sulfate is a larger molecule than glucosamine, radio-labelled studies have shown, like glucosamine, that it is absorbed from the intestinal tract. Once chondroitin sulfate enters the blood stream it has been traced to the joint tissues, where it acts to slow cartilage breakdown.



## Q What is the role of manganese in joint tissues?

Manganese is a trace element that naturally occurs in some foods and is present in the body as well. It is an important cofactor in the biochemical reactions by which joint tissues are made. Specifically, the reactions that make glycosaminoglycans out of glucosamine will not occur efficiently unless manganese is present in the body. Supplementing manganese helps ensure that GAG synthesis occurs at the maximum possible rate.

## Q Why is it important to use glucosamine & chondroitin sulfate together?

The glucosamine and chondroitin sulfate in Cosamin<sup>®</sup>DS work together in a synergistic manner to help the body renew joint cartilage. Taking the two compounds together is more effective than taking either alone based on their different mechanisms of action. Glucosamine helps the body to rebuild cartilage, and chondroitin helps to decrease cartilage breakdown. As an analogy, think of a very sore joint as a house with a fire smouldering in its wall. Rebuilding the wall is a good idea, but it's also important to try to put the fire out! With the synergy of Cosamin<sup>®</sup>DS ingredients, you can do just that.

## Q What can be expected using Cosamin<sup>®</sup>DS?

The loading dose requirements for Cosamin<sup>®</sup>DS are three (3) to four (4) capsules daily for a minimum of two months. If used appropriately, Cosamin<sup>®</sup>DS provides excellent results. For optimum results, two factors should be considered. Firstly, since Cosamin<sup>®</sup>DS depends in part on living cartilage cells for its effect, best results will be seen in those joints that have not yet been denuded of cartilage. Joints that have degenerated to the stage of bone on bone will not be able to respond maximally to Cosamin<sup>®</sup>DS. Secondly, it is important to remember that Cosamin<sup>®</sup>DS is designed to help the body replenish joint cartilage. This improvement in joint structure translates to an improvement in joint function. Unlike pharmaceuticals, Cosamin<sup>®</sup>DS does not work by masking the symptoms of joint disorders. Replenishing articular cartilage takes time. Most individuals will see and feel an improvement in 8 weeks or less. Extended use of Cosamin<sup>®</sup>DS will help to maximise cartilage production and improve synovial fluid quality in the majority of users.

## Q Have there been any clinical trials using Cosamin<sup>®</sup>DS?

Yes, two studies have recently been completed in the USA using Cosamin<sup>®</sup>DS. One study was conducted at the Portsmouth Naval Hospital with the Navy Seals. The other study was carried

out at the Hendersonville Orthopaedic Clinical in North Carolina. As reported on January 13, 1998 by Jane Broody of the New York Times, both studies produced positive results and have been published. In addition, Johns Hopkins University Hospital in Baltimore is developing a third human clinical trial. There have been many published animal studies by US veterinary schools documenting functional effects as well as structural effects on cartilage.

## Why are similar products sometimes available at less cost ?

Other products may try to mimic Cosamin<sup>®</sup>DS but under scrutiny they fail to measure up. Cosamin<sup>®</sup>DS is in a class by itself, and there is no generic equivalent. Since the high-grade raw material used in Cosamin<sup>®</sup>DS is available exclusively in Australasia and Asia to Biocel Australia, Cosamin<sup>®</sup>DS has unique quality. Because it is manufactured to exacting standards in a state of the art facility, Cosamin<sup>®</sup>DS has unique purity and uniformity. Because of its quality, purity and unique synergy, Cosamin<sup>®</sup>DS is actually more cost effective (better results at a lower dose) than other products that try to imitate it. On a dose equivalency basis Cosamin<sup>®</sup>DS is actually less expensive than most products of its kind. Additionally, Cosamin<sup>®</sup>DS is the only glucosamine and chondroitin sulfate product that has been subjected to human and animal trials. You know what you're getting when you buy Cosamin<sup>®</sup>DS, and it is patented. (US Patent Nos. 5,364,845 and 5,587,363)

## Why is Cosamin<sup>®</sup>DS available only through licensed health professionals ?

At Biocel Australia, we have a firm commitment to personal health and satisfaction. Cosamin<sup>®</sup>DS is not a drug and does not require a prescription, but we believe that an individual's health needs are best served by ongoing contact with a licensed

health professional who can provide a better understanding of the causes of joint dysfunction and help make informed choices in health care. This will ensure the best response from the use of Cosamin<sup>®</sup>DS.

## Where can I purchase Cosamin<sup>®</sup>DS ?

Cosamin<sup>®</sup>DS can only be purchased from your licensed healthcare provider. Only a licensed healthcare provider can order Cosamin<sup>®</sup>DS direct from Biocel Australia. All pharmacies have access to the product directly from Biocel Australia. It is important to ask your pharmacist or licensed healthcare provider specifically for Cosamin<sup>®</sup>DS because there is no generic equivalent. Cosamin<sup>®</sup>DS can be purchase at the pharmacy counter in most leading pharmacies.

## Is Cosamin<sup>®</sup>DS safe?

Yes, Cosamin<sup>®</sup>DS has an excellent safety record, with no demonstrable toxicity (LD50 > 5 grams/kg) and minimal incidence of mild, dose-dependant, reversible side effects, such as gastrointestinal gas. There are no known interactions with any drug or nutritional supplement, and no known contraindications for Cosamin<sup>®</sup>DS use.

## Does Cosamin<sup>®</sup>DS interact with Coumadin ?

Carefully designed animal studies have determined that Cosamin<sup>®</sup>DS has no clinical effect on blood clotting. There is no known indication that Cosamin<sup>®</sup>DS has any interaction with Coumadin or any other drug. However, since many factors can influence the blood clotting cascade, we recommend that all individuals taking Coumadin have their clotting times evaluated frequently, especially when introducing any additional nutritional or pharmaceutical agent into their regimen.

## Can Cosamin® DS be taken by individuals on a low salt diet?

Yes. Each capsule of Cosamin® DS contains 28 mg of sodium. At the loading dose of three capsules per day, this is a total of 84 mg of sodium, which represents only a small percentage of the total daily-accepted amount of sodium in a sodium-restricted diet (2000 mg per day).

## Can Cosamin® DS be taken by diabetics?

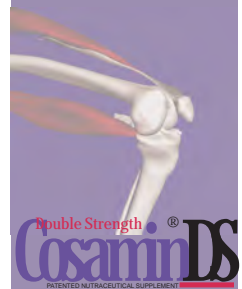
Yes. Although glucosamine and chondroitin sulfate are biochemically classed as carbohydrates (sugars), the body is not able to break them down into glucose, so these compounds do not raise blood sugar by providing an additional source of glucose. However, since many factors can affect insulin secretion and blood glucose levels in diabetic patients, we recommend that these individuals check their blood glucose levels frequently when initiating Cosamin® DS or any other new element into their regimen.

## Can Cosamin® DS be taken during pregnancy?

The ingredients of Cosamin® DS occur naturally in the body and there are no indications that Cosamin® DS has any harmful effects when used during pregnancy. However, no studies have been done in humans that specifically address this question, so the use of Cosamin® DS during pregnancy should be an individual decision made by the patient after consultation with her physician.

## Can Cosamin® DS be taken by patients allergic to sulfa drugs?

There is no cross-reactivity between sulfa drugs and Cosamin® DS. Sulfa drugs are characterised by having a benzene ring and a sulfanilamide group as part of their molecular structure. People who are allergic to sulfa drugs are probably reacting to their characteristic molecular structure. The compounds in Cosamin® DS do not have similar molecular structures. An allergy to sulfa drugs should not be interpreted as an allergy to sulfur. Sulfur is an essential element that is present in many foods and occurs in every cell in the body.





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1800-BIOCEL (1800-246-235) or visit our web-site at [www.biocel.com.au](http://www.biocel.com.au)  
or consult your physician or pharmacist