

# Examine.com

## Joint Health

## Medical Disclaimer & Important Note

This guide is a general health-related information product, intended for healthy adults over the age of 18.

This guide is for educational purposes only. It is not medical advice. Please consult a medical or health professional before you begin any exercise, nutrition, or supplementation program, or if you have questions about your health.

Participating in exercise activities or using products mentioned in this guide may pose risks for people in poor health or with pre-existing physical or mental health conditions.

Do not use any products or participate in any activities if you are in poor health or have a pre-existing mental or physical health condition. If you choose to participate, you do so of your own free will, and you knowingly and voluntarily accept the risks.

While we will mention major known drug interactions, it may be possible for any supplement to interact with medications or other drugs. If you are currently taking medication, consult a health professional prior to using any supplement in this guide.

Specific study results described in this guide should not be considered representative of typical results. Not all supplements provide the exact amount of compounds as listed on the label. Always investigate supplement companies, as well as the supplement itself, before purchasing anything. Herbs, rather than isolated compounds, may also have some variability from one batch to the next that can alter the efficacy.

To read the evidence supporting claims mentioned in this guide, please visit [Examine.com](https://www.examine.com).

# Table of Contents

---

04	How to use this Guide
05	Base Supplements
06	Proven Options
11	Unproven Options
13	Cautionary & Overhyped Options
14	Assembling Your Supplement Stack
17	Stack Modification FAQ
18	Precautions & Troubleshooting

# How to use this Guide

The team at Examine.com has been publishing research on nutrition and supplementation since March 2011. In that time, we've learned a great deal about supplements, especially how they can work together to help you with health goals.

This stack guide help you figure out which supplements can help you and which will hinder and/or be a waste of your money for your desired goals.

The following four sections present information on supplements that are relevant to *Cardiovascular & Heart Health*:

1. Base Supplements
2. Proven Options
3. Unproven Options
4. Cautionary and Overhyped Options

**Base Supplements** are recommended for the majority of people with this goal. They are either effective on their own or are required to boost the effects of another supplement. These are the first supplements to consider for your stack. Base Supplements are more researched and have less adverse drug interactions than options.

**Proven Options** are supplements that will provide a lot of benefits, but only in the right context. They cannot be recommended for everyone, but if you read the entry and find that you meet the criteria, feel free to add the supplement to your stack.

**Unproven Options** are another group of potentially beneficial supplements, but they lack evidence for their effects. They cannot be recommended with the same confidence as proven options. They could work or be a waste of your money - there is not enough evidence to know for sure. Keep unproven options in mind, but approach them cautiously when incorporating them into your stack.

**Cautionary and Overhyped Options** are supplements that are claimed to provide benefits but have been shown to be ineffective. If a supplement is deemed too risky to be used, it will also be found in this section. **Do not** add these compounds to your stack; they tend to be a waste of money or potentially harmful to your health.

Once we have explained the various supplements that you need to be aware of, the **Assembling your Supplement Stack** section will outline how different supplements can be combined, based on your objectives.

After that, we follow up with the **Stack Modification FAQ**, in which we cover common questions that may arise when assembling your stack.

Lastly, we include information on **Precautions and Troubleshooting**.

With all this combined, you should be able to identify and assemble a supplement stack best suited for your goals and objectives.

# Base Supplements

*Joint pain is caused by a variety of different factors. There are no supplements that can reliably provide benefits for all the conditions that may lead to joint pain, so there are no base supplements in the Joint Health stack.*

## Glucosamine

### **Why it is a proven option**

Glucosamine is the most researched joint health supplement for the treatment of knee osteoarthritis.

Supplementing glucosamine sulfate (not to be confused with glucosamine hydrochloride) has been shown to be comparable to taking acetaminophen, a pharmaceutical for treating knee pain caused by osteoarthritis.

Unfortunately, glucosamine doesn't work for everyone. Some people do not respond to glucosamine supplementation.

People supplementing glucosamine to alleviate joint pain should keep a close eye on their symptoms. If supplementation has no effect on joint pain, you may not respond to glucosamine supplementation.

### **How to take it**

To supplement glucosamine, take 500 mg of glucosamine sulfate, three times a day, with a meal, for a total daily dose of 1,500 mg.

Do not supplement glucosamine hydrochloride.

## Curcumin

### **Why it is a proven option**

Curcumin is a component of *Curcuma longa*, also known as turmeric. It is claimed to be an anti-inflammatory agent.

Curcumin can inhibit the cyclooxygenase (COX) enzymes, which reduces inflammation in the body. It acts similarly to nonsteroidal anti-inflammatory drugs (NSAIDs). Curcumin, when supplemented by people with knee osteoarthritis, has been shown to successfully treat pain and improve mobility.

Curcumin appears to be as powerful as other supplements and pharmaceuticals used to relieve joint pain caused by knee osteoarthritis.

Though it is a popular supplement among athletes, there is no evidence to support curcumin's effects when supplemented by people without knee osteoarthritis.

## **How to take it**

There are several ways to supplement curcumin. The molecule itself is poorly absorbed, but there are many different ways to increase its absorption. The two most common and tested methods include phytosomes and pairing curcumin with black pepper extract.

To supplement curcumin using a phytosome, take 200 mg of a curcumin phytosome, twice a day, with meals. If joint pain persists, this dose can be increased up to 500 mg, taken twice a day for a total daily dose of 1,000 mg. The brand Meriva was used in studies examining curcumin phytosome supplementation.

To supplement curcumin alongside black pepper, take 500 mg of curcumin with 20 mg of piperine (a compound in black pepper), three times a day, with meals.

## **Boswellia serrata**

### **Why it is a proven option**

*Boswellia serrata* is an herb often used to alleviate joint pain.

*Boswellia serrata* supplementation is effective at reducing joint pain associated with osteoarthritis, though more evidence is needed before it can be recommended for people with rheumatoid arthritis. Supplementation of *Boswellia serrata* has been found to be as effective as some pharmaceuticals, in terms of reducing pain and improving knee flexibility.

Traditional Indian medicine uses *Boswellia serrata* alongside *Curcuma longa*, the plant source for curcumin. Further research is needed to determine whether these two supplements actually have synergistic properties when taken together.

## **How to take it**

To supplement *Boswellia serrata*, take 1,800 mg of crude oleoresin, three times a day, for a total daily dose of 5,400 mg. Studies tend to use two concentrated brand name products called 5-Loxin and Aflapin. To supplement either one, take 100 – 250 mg, once a day, with a meal.

More research is needed to determine the dose for phytosomal *Boswellia serrata* supplementation.

## Fish Oil

### **Why it is a proven option**

Fish oil is a popular health supplement that can influence inflammation in the body. Fish oil is primarily made up of two separate omega-3 fatty acids: eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA).

Fish oil supplementation has been successfully used to alleviate joint pain not associated with a disease like osteoarthritis or rheumatism. It is effective for treating work-related joint pain. Fish oil is frequently supplemented by athletes. Though preliminary studies on fish oil and athletes didn't have very promising results, it turned out that much higher dosages of fish oil (more than 2,000 mg) could relieve joint pain in athletes. This is a much higher dosage than is standard for fish oil.

Fish oil has immunosuppressive properties, meaning it can provide benefits for people with rheumatoid arthritis.



## How to take it

Supplementing fish oil (in this context, referring to the combined EPA and DHA content) to alleviate joint pain requires high dosages of fish oil, usually more than 2,500 mg.

Fish oil should be taken with a meal, and can be divided into multiple doses throughout the day, although this is not required. People with diets high in fatty fish do not need to supplement as much fish oil as described above.

## Chondroitin

### Why it is a proven option

Chondroitin is a chain of sugars containing nitrogen, known as a glycosaminoglycan. It is a component of cartilage, and used as an oral supplement to support joint health. Chondroitin, in the form of chondroitin sulfate, is commonly supplemented alongside [glucosamine](#) for convenience.

Chondroitin is most studied in the context of alleviating knee osteoarthritis. Supplementing chondroitin can reduce pain and improve mobility. It may also reduce water retention in inflamed joints.

More research is needed to determine whether chondroitin and glucosamine are synergistic when supplemented together.

Chondroitin may have an anti-coagulant effect. People on blood thinning medication like warfarin should be very cautious when supplementing chondroitin.

### How to take it

To supplement chondroitin, take 200 - 400 mg of chondroitin sulfate, three times a day for a total daily dose of 600 - 1,200 mg. Higher doses tend to be more effective at relieving joint pain.

## Vitamin C

### **Why it is a proven option**

Though vitamin C does not play a major role in most joint disorders, it is effective at preventing complex regional pain syndrome (CRPS). CRPS is a very painful chronic joint condition.

CRPS is characterized by swollen joints and changes in skin and hair quality. It can be caused by orthopedic surgery or joint injury. The only known preventative measure is vitamin C supplementation.

Vitamin C is also vital for collagen formation, so a vitamin C deficiency can be detrimental for joint health.

### **How to take it**

To supplement vitamin C to treat CRPS pain, take 500 mg, once a day, ideally in the morning.

People with joint pain not associated with CRPS can take 500 mg of vitamin C a day, for up to two months. If, after two months, pain has not been reduced, cease supplementation.

## Pycnogenol

### **Why it is an unproven option**

Pycnogenol is the brand name for a source of procyanidin B2. Procyanidin B2 has anti-inflammatory properties and can improve blood flow.

Pycnogenol supplementation has been found to benefit people with osteoarthritis. Further research is needed to confirm this effect. The effects of Pycnogenol take longer than most supplements to set in. Maximal benefit is usually experienced after three months of continuous supplementation.

Grape seed extract is another source of procyanidin B2. It is cheaper than Pycnogenol and may be more viable for supplementation.

### **How to take it**

To supplement Pycnogenol, take 90 – 200 mg, once a day, with breakfast.

To supplement grape seed extract (GSE), take 150 – 300 mg, once a day, with breakfast.

**Note:** GSE may be cheaper, but it also has less evidence for its effects and its benefits for joint health have never been directly demonstrated, though it is thought to work similarly to Pycnogenol.

## Cissus Quadrangularis

### **Why it is an unproven option**

*Cissus quadrangularis* is an herb traditionally used to heal joints and bone fractures. Its healing effects may be due to its anti-inflammatory properties and the growth factors it induces in bone and tissue joints.

*Cissus quadrangularis* is frequently supplemented by athletes, particularly martial artists, to alleviate joint pain. Much more research is needed to determine if *Cissus quadrangularis* supplementation really can alleviate joint pain, but preliminary evidence is promising.

## How to take it

To supplement *Cissus quadrangularis*, take 300 – 600 mg of a *Cissus quadrangularis* supplement standardized at 2.5% ketosteroid content.

Start at the low end of the dosage range and supplement for a week before slowly increasing the dose to 3,200 mg, or until *Cissus quadrangularis* supplementation alleviates joint pain. Benefits for joint pain are usually seen at doses of 3,200 mg.

*Cissus quadrangularis* supplementation may relax the muscles, so it should be taken after a workout or before bed.

# Cautionary & Overhyped Options

## Thunder God Vine

*Tripterygium wilfordii*, also known as thunder god vine, is an herb used in traditional Chinese medicine to alleviate joint pain and rheumatism.

Though it appears to be effective at treating rheumatoid arthritis, it should not be supplemented because the dose needed to benefit from thunder god vine's effects is very close to a harmful dose. Thunder god vine toxicity causes the death of white blood cells. This is why it is able to alleviate rheumatoid arthritis, since it soothes the inflammation around the joints. White blood cell death makes users of thunder god vine susceptible to infection, sickness, and death.

Thunder god vine ***should not be supplemented*** because it is not safe.

## Traumeel

Traumeel is a popular homeopathic supplement available in topical and oral formulations. It's touted as a remedy for both acute and chronic pain and inflammation, largely due to containing an herb called arnica.

Unfortunately, it contains extremely tiny amounts of arnica due to the homeopathic formulation, which is not absorbed through the skin, and does not get anywhere near the joint. Although Traumeel contains a variety of other herbs, they are also typically at very low levels and would not make it to the joint.

Note that while Traumeel is marketed as a homeopathic remedy, many of its ingredients are present at levels much higher than what is considered "homeopathic," and the oral Traumeel formulation may have bioactive components (while still not treating pain). While some studies show positive effects for Traumeel, they are generally of poor methodological quality and at risk for bias.

# Assembling Your Supplement Stack

The following outlines how to incorporate this supplement stack into your daily nutrition habits.

## Incorporating Base Supplements

There are no base supplements in the Joint Health stack because joint pain can be caused by many different factors. There are no supplements that will provide benefits for all joint pain cases.

## Incorporating Supplement Options

### For people with osteoarthritis who are not taking medication

Take **glucosamine** sulfate (500 mg) and **chondroitin** sulfate (400 mg), once a day, with a meal.

If, after a month, joint pain has not been reduced, swap either glucosamine or chondroitin for **curcumin** (see below for dose) or ***Boswellia serrata*** (100 - 250 mg), taken daily, alongside **Pycnogenol** (90 - 200 mg) or **grape seed extract** (150 - 300 mg).

If, after two months, mobility has not improved or pain has not been reduced, switch curcumin for *Boswellia serrata*, or vice versa. If you find a combination of supplements that effectively reduces pain, continue to supplement at the doses described above.

---

### For people with rheumatoid arthritis

If you are already taking medication for rheumatoid arthritis, talk to your doctor about supplementing **fish oil** (2,000 mg) daily.

---

# Assembling Your Supplement Stack (cont.)

## For people with joint pain unrelated to a disease

Supplement either **curcumin** (see below for dose) or *Boswellia serrata* (100 – 250 mg) daily, for one to two months alongside **Pycnogenol** (90 – 200 mg) or **grape seed extract** (150 – 300 mg). Stop supplementation after 90 days to determine if joint pain has improved.

---

## For people with joint pain related to athletics

Supplement **fish oil** (2,500 mg combined EPA and DHA) daily with meals. The supplemental dose can be decreased if you eat fatty fish several times a week.

**Note:** Supplementation is not a primary treatment for injuries, and should only be used to reduce pain associated with injury. Supplementing to alleviate pain in order to continue exercising instead of tending to an injury will greatly increase the risk of and severity of future injuries.

---

## Other Options

*Cissus quadrangularis* (3,200 mg of a supplement containing 2.5% ketosteroids) can also be considered as an option for athletes with joint pain, but is not currently added to any stack due to a lack of evidence for its effectiveness. Curcumin is another option for athletes, but cannot be recommended in the above stack because it is rarely studied in the context of athletics.

There are several ways to supplement **curcumin**. The two most common and tested methods include phytosomes and pairing curcumin with black pepper extract. To supplement curcumin using a phytosome, take 200 mg of a curcumin phytosome, twice a day, with meals. If joint pain persists, this dose can be increased up to 500 mg, taken twice a day for a total daily dose of 1,000 mg. The brand Meriva was used in studies examining curcumin phytosome supplementation. To supplement

# Assembling Your Supplement Stack (cont.)

curcumin alongside black pepper, take 500 mg of curcumin with 20 mg of piperine (a compound in black pepper), three times a day, with meals.

**Vitamin C** can be supplemented to prevent complex regional pain syndrome (CRPS). People at risk for CRPS can add vitamin C (500 mg) to any stack described above.



## How do I add supplements to my stack that are not covered in this guide?

Before adding a new supplement to your stack, supplement your current stack for a few weeks to determine if you need to make a new addition. If you want to make multiple changes to your stack, pick one supplement to add at a time. Identify the stack change that you think will be the most effective, and do your research:

1. Use [Examine.com](https://www.examine.com) to determine if that supplement would have a negative interaction with your current stack. Talk to your doctor about including a new supplement in your stack.
2. Introduce the new supplement at half of the regular dose.
3. After a week with the new supplement, slowly increase the dose to the recommended dose if you are not experiencing the effects you want.

Stacks are intended to be synergistic, which means taking two supplements together may provide more effects than the supplements by themselves. New supplements should be added carefully, since even low doses can be powerful if other supplements in your stack improve their effects.

## Can I modify the recommended doses?

If a supplement has an established advised dosage range, stay within that range. If a supplement has a recommended dose, and not a range, stay within 10% of that dose. Halving or doubling an advised dose could be ineffective or even dangerous.

The safest way to add dietary supplements to your life is one at a time. If you are considering purchasing several supplements, purchase only one and add the others after a week or two of supplementation. This will limit the risk of new supplements, and it will also make it easier to figure out what supplements are providing you with your newfound benefits.

# Precautions & Troubleshooting

The safest way to add dietary supplements to your life is one at a time. If you are considering purchasing several supplements, purchase only one and add the others after a week or two of supplementation. This will limit the risk of new supplements, and it will also make it easier to figure out what supplements are providing you with your newfound benefits.

People with joint pain that lasts for several weeks or more should see a doctor. Though it is uncommon, joint pain can be associated with serious medical conditions like lupus and certain cancers.

Do your research on treatments offered by physicians. Some treatments can be harmful when repeated over time, like cortisone shots. Chronic use of non-steroidal anti-inflammatory drugs (NSAIDs) can damage intestinal lining. Joint surgery can result in a variety of complications, including increased joint pain, bleeding, and loss of function.

It is not longer recommended to rest and immobilize injured joints, since it can lead to stiffness, decreased range of motion, increased pain, and occasionally frozen joints. Instead, practice gentle range-of-motion exercises.