

Examine.com

Bone 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).

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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.

Calcium

Why you should take it

Calcium is one of the major mineral components of bone. Having a diet low in calcium will put you at risk for many bone disorders late in life. Low calcium levels are associated with osteopenia and osteoporosis, diseases characterized by dangerously low bone density. It should be noted that higher dietary levels of calcium do not necessarily confer a protective effect.

Having a diet rich in calcium will render calcium supplementation unnecessary. Milk, dark leafy greens, and cheese are all foods with high levels of calcium. Supplementing [whey](#) or [casein protein](#) will provide 20% and 40% of calcium's recommended dietary allowance per scoop, respectively.

If changing your diet to increase calcium consumption is possible, it should be done before supplementation is considered. Not only is it cheaper, but healthier and tastier as well.

Calcium can affect the absorption of several pharmaceuticals such as bisphosphonates, levothyroxine, tetracycline or quinolone antibiotics and may otherwise interact with some drugs such as diuretics (which increase calcium levels) or digoxin.

How to take it

Calcium should be supplemented with a meal. Excess calcium may cause constipation. If constipation occurs, reduce the calcium dose or consider [Vitamin D](#) supplementation in addition to calcium.

Excess calcium levels (usually via supplementation of high doses in addition to the diet) have been linked to increased risk for cardiovascular incidents related to hypercalcemia.

Magnesium

Why you should take it

Magnesium, like calcium, is an important dietary mineral and a major component of bones.

Most people do not get enough magnesium through their diet. Magnesium deficiencies are associated with bone loss. Bone loss can be prevented through magnesium supplementation.

Diets high in magnesium will pay off, as high magnesium levels are associated with significantly higher bone mass in old age.

Magnesium is safe, effective and commonly paired with calcium in one supplement, making it an ideal base supplement for bone health.

People with diets high in magnesium do not need to supplement magnesium. Fibrous vegetables and nuts are particularly high in magnesium, with additional high sources of magnesium being dark chocolate and coffee.

Magnesium can interfere with the absorption of several pharmaceuticals unless taken two hours before or four hours after the drug. These pharmaceuticals include calcium channel blockers (CCBs), bisphosphonates, and quinolone and tetracycline antibiotics.

How to take it

The standard dose for magnesium is 200 mg of elemental magnesium, though doses of up to 400 mg can be used. Elemental magnesium content is found on the supplement label. It is the amount of magnesium in the supplement, excluding other compounds that may be included.

Magnesium can be supplemented through magnesium citrate, magnesium tartrate, magnesium diglycinate, and magnesium gluconate. Magnesium oxide is not recommended for supplementation because it can cause intestinal discomfort and diarrhea and has less bioavailability than other forms.

Magnesium gluconate should be taken with a meal to increase the absorption of the supplement, but other forms of magnesium can be taken either with food or on an empty stomach.

Vitamin D

Why you should take it

Vitamin D is a general health supplement, and it also helps bones stay dense and strong.

High levels of vitamin D are associated with improved bone mineral density. This is especially important for older people. Vitamin D increases the rate at which minerals accumulate in bones, leading to greater overall growth.

Vitamin K can improve the effects of vitamin D at the level of the bone cells when the two supplements are taken together, and vitamin D can increase the absorption of calcium from the intestines.

How to take it

To supplement vitamin D, take 2,000 IU of vitamin D a day, in the form of vitamin D3. Vitamin D should be taken with a meal, and due to anecdotes suggesting it can impair sleep, it may be prudent to take it in the morning.

If you are outside frequently and live near the equator, you may not need to supplement vitamin D due to enough synthesis from the sun. Do note that it requires exposed skin for your body to synthesize vitamin D.

Note: People with darker skin tones will require more sun exposure than lighter skinned people to get the same amount of vitamin D.

Vitamin K

Why you should take it

Vitamin K is a fat soluble vitamin is synergistic with vitamin D for bone formation.

Vitamin K supplementation does not increase bone density. Since it increases the rate at which minerals accumulate in the bone, it actually increases bone size. Vitamin K supplementation can protect bones from fracturing, which is particularly important for older people, for whom falls can be very damaging.

Vitamin K is listed as a base supplement because it is very safe, synergistic with vitamin D, and effective.

How to take it

The optimal dose for vitamin K is 1,000 mcg. This is much higher than the recommended daily intake (RDI) for vitamin K in many countries. Vitamin K should be supplemented alongside a meal containing dietary fat sources.

Vitamin K can be supplemented through vitamin K1 (the plant form) and vitamin K2 (the animal form). Vitamin K2 is actually a series of molecules, designated by labels like MK-4 and MK-7.

Vitamin K1 and vitamin K2 MK-7 are both recommended over Vitamin K2 MK-4. To supplement vitamin K1, take 1,000 mcg. To supplement vitamin K2 MK-7, take 200 mcg.

Blending a large amount of kale (500 g, around 7.5 cups) will provide the same amount of vitamin K as described above. The fermented soybean food product natto is another source of vitamin K, though you would need to eat 50 g a day to make supplementation unnecessary.

When supplementing kale, consider increasing the level of [iodine](#) in your diet. Goitrogens present in kale, in high quantities (as applies to 500 g), have been noted in a few case studies to cause hypothyroidic symptoms and ingesting iodine is a simple preventative measure.

Do not supplement vitamin K if you are taking warfarin or blood thinning medication.

Proven Options

There are no proven options that can be taken reliably for bone health.

Unproven Options

There are no unproven options that can be recommended at this time.

Coral calcium

Coral calcium is a kind of calcium supplement that contains additional ingredients, similar to the difference between sea salt and table salt.

There is no evidence to suggest coral calcium supplementation is more effective than standard calcium supplementation. Since creating coral calcium involves scavenging coral reefs, there may be some environmental concerns with coral calcium supplementation as well.

Coral calcium is not recommended for supplementation.

Cissus Quadrangularis

Cissus quadrangularis is an herb sometimes used in traditional Indian medicine to relieve joint pain and speed up bone healing after fractures and similar injuries. It is marketed as a healing supplement and a general anabolic agent for bone tissue.

There is no evidence to suggest Cissus quadrangularis supplementation can heal fractures. Cissus quadrangularis supplementation does stimulate bone growth, but more research is needed before it can be claimed to improve bone regeneration.

Assembling Your Supplement Stack

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

Incorporating Base Supplements

The base supplements for bone health are **vitamin D** (2,000 IU) and **vitamin K** (up to 1,000 mcg K1, or 200 mcg MK-7), taken with the first meal of the day.

Calcium (500 mg) and **magnesium** (200 – 400 mg) should only be supplemented after a dietary evaluation. Track what you eat for a week, taking note of calcium and magnesium levels in your food. Compare your magnesium intake with the recommended daily intake (RDI) for your gender and age. If you are getting 80 - 100% of your RDI on average, you do not need to supplement calcium or magnesium. Calcium and magnesium should only be supplemented if dietary modifications to improve calcium and magnesium levels are not an option.

Magnesium can interfere with the absorption of several pharmaceuticals unless taken two hours before or four hours after the drug. These pharmaceuticals include calcium channel blockers (CCBs), bisphosphonates, and quinolone and tetracycline antibiotics.

Calcium can affect the absorption of several pharmaceuticals that affect bone health. Talk to your medical doctor if you are taking bisphosphonates, calcium channel blockers (CCBs), levothyroxine, certain diuretics, digoxin, tetracycline or quinolone antibiotics.

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.

You mentioned that protein protected bones? Isn't it the opposite?

Early evidence suggested protein could increase rates of bone loss due to the increased calcium levels in urine seen after protein ingestion. Later studies showed that protein actually protects against bone loss in old age, and is vital to improving bone mass. The studies that found increased calcium levels in urine failed to account for the calcium content in the original protein source, which was dairy protein. Urinary calcium levels are also not very good biomarkers for bone mass, meaning that the two are not related.

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.

Due to vitamin D enhancing the absorption of calcium, the combination of calcium and vitamin D supplementation can lead to a synergistic increase in calcium absorption. That being said, higher serum calcium is a risk factor (likely causative) for calcification of arteries and coronary heart disease risk. Supplementation should either be limited to vitamin D, or supplementation of vitamin K (which works in the opposite direction of vitamin D in this regard and is protective) should be used alongside the combination.