

Examine.com

Testosterone Boosting & Enhancement

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
09	Proven Options
10	Unproven Options
13	Cautionary & Overhyped Options
14	Assembling Your Supplement Stack
16	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.

Zinc

Why you should take it

Zinc is a dietary mineral that is often promoted for boosting testosterone. It's true that taking a zinc supplement can increase testosterone levels, but only in people who have a zinc deficiency. Athletes are more prone to zinc deficiency than the general population because zinc can be lost through sweat.

Zinc deficiencies are associated with lower testosterone levels, so if supplementation brings zinc levels back to normal, testosterone levels will rise with it. It is important to note that increasing zinc levels above normal body levels will not increase testosterone any further. High doses of zinc can irritate the gastrointestinal tract and cause liver and kidney damage. Over time, high doses of zinc can result in a copper deficiency.

How to take it

Zinc should be supplemented in the range of 25 - 30 mg of elemental zinc per day. Elemental zinc refers to the weight of zinc itself, and excludes the weight of the compound it is supplemented with to help absorption. For example, consuming 230 mg of zinc gluconate means consuming 30 mg of elemental zinc. ***The label displays the elemental dosage, not the total dosage.***

Zinc should be taken with meals, since some people may experience nausea after supplementing zinc on an empty stomach. Do not pair zinc with minerals like [calcium](#), [magnesium](#), and iron in combined doses of 800 mg or more. Combining them at low doses is fine, but in high amounts the minerals will compete for absorption and limit the overall effectiveness of supplementation.

Note: This dose is commonly recommended for athletic people who have high zinc losses in sweat. If you are either sedentary, don't produce a large amount of sweat, or have a diet moderate to high in meat products this dose could be dangerous for long-term daily usage. If that is the case, then reduce the daily dose to the range of 10-20 mg once daily.

Magnesium

Why you should take it

Magnesium is a dietary mineral, like zinc. Magnesium deficiencies are associated with lowered testosterone levels.

Supplementing magnesium when deficient in magnesium will restore testosterone levels to normal. People without a magnesium deficiency should not supplement magnesium, as it will not raise testosterone levels above normal.

Like zinc, magnesium is lost through sweat, so it is often recommended for athletes.

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 diglycinate, and magnesium gluconate. Magnesium oxide is not recommended for supplementation because it is poorly absorbed and is more likely to cause intestinal discomfort and diarrhea.

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 has often been researched in the context of male fertility. In fact, vitamin D receptors are located on sperm cells. Vitamin D may also play a role in the production of steroid hormones.

Studies have shown that for men with low vitamin D levels, supplementing vitamin D over the course of a year resulted in an increase in testosterone levels. It is not known if this is due to fixing low testosterone or due to an inherent increase in testosterone, as the study was conducted in middle-aged men who may have experienced an age-related testosterone decline.

Vitamin D is a base supplement because it is very safe, cheap, and guards against low testosterone levels. Most people do not get enough vitamin D. People living near the equator that get a lot of sun may not need to supplement vitamin D. Vitamin D should be supplemented throughout winter, since sun exposure is less frequent during cold seasons.

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

How to take it

To supplement vitamin D, take between 2,000 – 3,000 IU a day. The lower end of the range our usual recommended dose, while the higher end is similar to the dosages used in studies on vitamin D and testosterone.

Vitamin D should be taken with meals containing dietary fat. It is sometimes taken in the morning due to anecdotal reports that it may impair sleep quality if taken too close to bedtime.

Creatine

Why you should take it

Creatine is a small organic acid which serves as an energy intermediate, replenishing ATP levels in a cell faster than glucose or fatty acids. It is most well known for its ability to increase the rate of muscle growth and improvements in strength during training.

Creatine has been investigated for its interactions with androgens a few times, and in young men (18-35 age bracket) it appears to cause a mild but reliable increase in testosterone concentrations by around 20-25%. This increase in

testosterone is thought to be partially responsible for the effects of creatine on muscle growth and power output.

Creatine is safe, but further research is needed to determine the mechanism through which it increases testosterone levels. More studies are needed to research creatine's effect on testosterone when supplemented by women. An increase in dihydrotestosterone (DHT) was observed in one study, but this has not been replicated.

How to take it

The best way to supplement creatine is to take creatine monohydrate. Other forms of creatine may be more expensive, but studies have not found them to be more effective than creatine monohydrate.

If you are particularly sensitive to creatine's digestive side-effects, which include nausea and cramping, consider supplementing micronized creatine, which may be gentler on the digestive system.

The standard daily dose for creatine is 5 g a day. This is enough to improve power output. People with more muscle mass may benefit from a higher daily dose, as much as 10 g, but this claim is not fully supported by the evidence. To supplement 10 g, split it into two doses of 5 g during the day.

Loading creatine means taking a high dose of creatine for a short period of time before moving down to a smaller maintenance dose, which can be taken indefinitely. This is not necessary for effective supplementation. Though loading may result in benefits appearing slightly faster, results normalize after a few weeks.

Some people are creatine nonresponders, which means creatine is unable to pass from their blood to their muscles.

More research is needed to find a proven way to circumvent creatine nonresponse. Some evidence suggests it helps to take creatine with a meal high in both protein and carbohydrates, close to the time of actual muscle

contraction. If you experience creatine nonresponse, consider taking creatine with a meal either before or after a workout.

If you respond to creatine, you don't have to worry about timing supplementation, though you will probably want to take it with a meal to lower the risk of an upset stomach.

DHEA

Why it is a proven option

Dehydroepiandrosterone (DHEA) is a compound needed to produce testosterone and estrogen. People with low hormone levels can supplement DHEA to increase testosterone and estrogen levels.

DHEA does not act directly on the androgen or estrogen receptors. Instead, DHEA circulates throughout the body and can be called on by the body to create hormones as needed.

Supplementing DHEA will not increase testosterone levels above normal. People with healthy hormone levels do not need to supplement DHEA.

DHEA is most reliable when supplemented by people suffering from age-related low testosterone.

As DHEA is a mild CYP3A4 inhibitor, it should not be used alongside pharmaceuticals that are metabolized by this enzyme.

How to take it

To supplement DHEA, take 25 – 50 mg once a day, with a meal.

D-Aspartic Acid

Why it is an unproven option

D-Aspartic acid (D-AA) is a dietary amino acid that can boost testosterone levels.

D-AA, when supplemented by healthy men, can increase testosterone levels after about a week of supplementation, but testosterone levels return to normal after approximately two weeks of supplementation. Men supplementing D-AA may experience up to a 50% increase in testosterone levels at peak efficacy, while similar potency is thought to exist in infertile men although without the decline in testosterone.

D-AA, if supplemented, should be cycled quickly. Further research is needed to determine if D-AA has any practical benefits for healthy men.

How to take it

To supplement D-aspartic acid (D-AA), take 3,600 mg once a day. D-AA should be taken in the morning, or before exercise, either on an empty stomach or with a meal low in protein. Further research is needed to determine the optimal dosing or timing of this supplement.

D-AA should be supplemented for 10-14 days, after which supplementation should stop for at least a month.

Boron

Why it is an unproven option

Boron is a dietary mineral. It is sometimes recommended for postmenopausal women with low hormone levels. It has also been promoted as an aid to athletic performance due to purported effects on testosterone levels in men.

Though some studies have even found benefits when supplemented by young men, boron's effects are unreliable.

Though boron may be a potential testosterone booster, much more research is needed to determine its effects on hormone levels and what mechanism is responsible for these effects.

How to take it

Studies on young men and testosterone use a 10 mg dose of boron. Do not take more than 20 mg of boron.

Coleus Forskohlii

Why it is an unproven option

Coleus forskohlii is a plant, supplemented for its ability to improve cyclic adenosine monophosphate (cAMP) levels. Increased cAMP levels are associated with improved muscular power output.

Increased cAMP levels in the testicles will increase testosterone synthesis. Since *Coleus forskohlii* increases cAMP levels in cells all over the body, supplementation of *Coleus forskohlii* has been noted to increase testosterone synthesis in one study on overweight men.

Coleus forskohlii is listed as an unproven option because more research is needed to determine the long term effects of supplementing forskolin, the bioactive compound responsible for *Coleus forskohlii*'s effects. Due to a lack of information on its long term effects, *Coleus forskohlii* should be cycled.

Coleus forskohlii should not be taken with calcium-channel blockers or nitrates. Combining these supplements can result in hypotension, characterized by abnormally low blood pressure.

How to take it

To supplement *Coleus forskohlii*, supplement 50 mg of forskolin a day, split up into two 25 mg doses twice a day. To supplement 25 mg of forskolin, assuming a 10% forskolin *Coleus forskohlii* extract, take 250 mg of extract, twice a day, for a total dose of 500 mg of the extract.

Coleus forskohlii doses should be taken four to six hours apart.

Unproven Options (cont.)

Do not take *Coleus forskohlii* if you are taking blood pressure medications. Combining these supplements can result in hypotension, which is abnormally low blood pressure.

Libido Enhancers

There are many supplements on the market claiming to enhance testosterone. Many of them are herbal supplements, which may improve libido and boost confidence, but do absolutely nothing for testosterone levels.

These libido enhancers include herbs like [Tribulus terrestris](#), [maca](#), and [fenugreek](#). All of these herbs have been shown to have no effect on testosterone levels. Since they still have a very noticeable effect on libido, people often assume the supplement is effective and continue to purchase it.

Other herbs, like [eurycoma](#) and [ginger](#), can only increase testosterone when supplemented by infertile people, or men with testicular damage.

Many other herbs, like [horny goat weed](#), haven't even been studied in humans yet.

Though it is possible for an herbal supplement to increase testosterone, the majority of herbs on the market have no effect on testosterone levels, though they may improve libido.

Stinging Nettle

Stinging nettle is a plant often recommended as a testosterone enhancing supplement.

Though theoretically, stinging nettle supplementation should raise testosterone levels, this does not occur after supplementation. Further research is needed to determine why stinging nettle has no effect on testosterone.

Stinging nettle supplementation does not appear effective for the purpose of increasing testosterone and it should not be added to any testosterone enhancement stack.

Assembling Your Supplement Stack

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

Incorporating Base Supplements

The base supplements in the Testosterone Boosting & Enhancement stack include **zinc** (25 – 30 mg), **magnesium** (200 – 400 mg), **vitamin D** (2,000 – 3,000 IU) in the form of vitamin D3, and **creatine** at around 5 g a day in the form of monohydrate.

Vitamin D can be taken any time of day, but is most often taken in the morning alongside a meal containing dietary fat. This meal can also easily contain the creatine.

Note: Magnesium and zinc can be supplement through a supplemented called [ZMA](#). This is a combination of magnesium, zinc, and vitamin B6. Vitamin B6 does not interfere with the effects of magnesium and zinc, and it may help prevent mineral losses to sweat.

Incorporating Supplement Options

Supplementing multiple compounds should always be done cautiously, but people supplementing multiple stimulants should be especially careful. Stimulant compounds can be synergistic, which means that even low doses can provide powerful effects when taken with other supplements.

For young men (estimated age of 35 or less) that want increased testosterone levels

Take the base supplements **zinc** (25 – 30 mg), **magnesium** (200 – 400 mg) and **vitamin D** (2,000 – 3,000 IU) in the form of vitamin D3.

Take **D-aspartic acid** (3,600 mg) for 1 - 2 weeks. After two weeks of supplementation, pause supplementation for a month.

Assembling Your Supplement Stack (cont.)

The aforementioned directions for using D-aspartic acid can be paired with *Coleus forskohlii* (50 mg of forskolin).

Increasing testosterone levels through supplementation is not comparable to a steroid cycle. Supplementing D-aspartic acid has not been linked to an increase in muscle mass.

For middle-aged people who want to maintain testosterone levels

Take the base supplements **zinc** (25 – 30 mg), **magnesium** (200 – 400 mg) and **vitamin D** (2,000 – 3,000 IU) in the form of vitamin D3.

Add **DHEA** (25 - 50 mg) and follow a healthy diet and exercise plan.

Other Options

Though **boron** is mentioned in this guide because it may interact with testosterone, it is not recommended for any stacks due to a lack of human evidence for its effects. Much more research is needed before boron can be recommended for testosterone enhancement.

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.

Can't I just increase the dose of D-aspartic acid after two weeks of supplementation?

Though increasing your D-aspartic acid dose after two weeks of supplementation could prevent the normalization of testosterone normally seen with D-aspartic supplementation, this could exacerbate the activity of an enzyme called D-amino acid oxidase. The more active this enzyme is, the more your testosterone levels will drop once you finally stop supplementing D-aspartic acid. This could cause significant withdrawal effects, lethargy, and low testosterone. ***Do not increase your D-aspartic dose after two weeks.*** This method of D-aspartic acid supplementation is counterproductive to increasing testosterone levels.

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.

Men experiencing male pattern baldness, also known as a receding hairline, should avoid increasing dihydrotestosterone (DHT) levels, since this can exacerbate the rate of hair loss. Increasing testosterone levels in the body tends to increase DHT levels.

If the above stacks successfully raise your testosterone levels then it is also possible they can increase DHT levels. This is not thought to be a concern when a 5-alpha reductase inhibitor such as finasteride is taken.

Finally, the potency of the above supplements is markedly less when compared to androgenic-anabolic steroids (AAS) and although they are supplemented for a similar goal (increasing muscle mass), they are not comparable.