

Unique Health Benefits of Vitamin E

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✓ Fact Checked

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STORY AT-A-GLANCE

- › Vitamin E is fat-soluble and comes in eight chemical forms; alpha-tocopherol is the most studied of them and according to the NIH, the only one that meets human requirements
- › Vitamin E is a strong antioxidant that has photoprotective properties and helps prevent some cancers. A 2022 paper concludes vitamin E may help enhance cancer immunotherapy by reinvigorating dendritic cells critical to an immune response
- › Maintaining optimal levels may help lower systolic blood pressure and diastolic pressure to a lesser degree. Vitamin E insufficiency is associated with an increased risk of cardiovascular events
- › Vitamin E may help fertility, demonstrates neuroprotective properties and in combination with vitamin D, vitamin E helps lower symptoms of premenstrual syndrome (PMS)
- › While you won't overdose on vitamin E-rich foods because it's a fat-soluble vitamin and is stored in fat cells, you can overdose with supplements. This can trigger adverse side effects, including inhibition of platelet aggregation and bleeding

Researchers have discovered that vitamin E comes in eight different forms but only one appears to meet human requirements, according to the National Institutes of Health.¹ Some foods are a natural source of vitamin E, which is the name for this group of fat-soluble compounds. Each of the eight forms has some level of biological activity, but it's alpha-tocopherol that scientists have found prevents the propagation of free radicals and which the body prefers to use.

Additionally, only alpha-tocopherol supplementation has been shown to reverse symptoms of a vitamin E deficiency.² There are four tocopherol isoforms and four tocotrienol isoforms. Alpha-tocopherol is incorporated into lipoproteins in the liver that are then transported throughout the body.

While this has been the primary chemical form studied, researchers have also found that some forms of tocotrienols have biological activity, although they have lower systemic bioavailability.³

According to the NIH,⁴ three national surveys showed most Americans may consume less than the recommended dietary allowance (RDA) of vitamin E developed by the Food and Nutrition Board (FNB). The RDA for alpha-tocopherol, which is the only recommendation made by the FNB, is from 11 mg to 15 mg beginning at age 9 through senior years. The RDA for lactating women is 19 mg per day.

The FNB believes alpha-tocopherol intake in healthy adults is likely higher than the national surveys indicate, since frank deficiency is rare and overt symptoms are not usually found in healthy people. However, as you are likely aware, there is a significant difference between overt deficiency and insufficiency that increases your risk of health conditions. Research data has now linked vitamin E with several unique health benefits.

Vitamin E Is a Strong Antioxidant Fighting Aging and Cancer

Understanding the importance of antioxidants began as scientists learned how free radical damage was involved in the early stages of atherosclerosis and that free radical damage may be involved in a host of other chronic health conditions.⁵ Vitamin E plays a significant role as an antioxidant as it scavenges loose electrons and reduces cellular damage.

One of the benefits of lowering free radical damage is reducing skin damage after UV exposure. Vitamin E has been used in dermatology for more than 50 years and is added to cosmetic products.⁶ Additionally, the presence of vitamin C can slow lipid oxidation by regenerating alpha-tocopherol from radicals found in cell membranes.⁷

Vitamin E is a major lipid-soluble antioxidant, protecting against oxidative stress in the epidermis and dermal layers of the skin. Data show that it has strong photoprotective and antiaging properties that help to improve elasticity and structure of the epidermis and dermis. Topical application has been widely used, after which vitamin E accumulates in the cell membranes and extracellular lipid matrix, where it contributes to antioxidant defenses.⁸

In April 2022, researchers from MD Anderson Cancer Center⁹ published a paper in *Cancer Discovery*,¹⁰ in which they discuss data that show vitamin E may enhance cancer immunotherapy through a pathway that reinvigorates dendritic cells.

Dendritic cells have been a focus in cancer immunotherapy as they are critical in the immune response. Several strategies have been developed to target these cells in the hope that a better understanding of their function may help improve cancer therapies.¹¹ The researchers found that an analysis of electronic health records showed patients who took vitamin E had significantly improved survival rates.¹²

Recognizing that the impact of nutritional supplements in addition to immunotherapy is a relatively unexplored area, the researchers undertook an analysis of vitamin E and found that it blocks the activity of the SHP1 checkpoint, which in turn improves T cell ability to mount an antitumor immune response.¹³ Another 2020 study,¹⁴ looked at the benefits of using alpha-tocopherol in cancer prevention.

Researchers began with the understanding that those with a lower nutritional status had an increased risk of cancer and in some populations, supplementation had beneficial effects in lowering the risk. Other studies have focused on tocotrienol and the gamma and delta forms of tocopherols. While these three vitamin E compounds have a lower bioavailability, they appeared to have stronger cancer-preventive properties in animal models and cell lines.

Optimal Levels May Normalize High Blood Pressure

High blood pressure is a risk factor for cardiovascular disease. One 2002 triple-blind, placebo-controlled clinical trial¹⁵ evaluated the effects of vitamin E on blood pressure and heart rate in 70 individuals diagnosed with mild high blood pressure. At this time, the new blood pressure guidelines from the American College of Cardiology and American Heart Association had not yet been released.¹⁶

While the 2002 study categorized the participants with mild high blood pressure, the new guidelines would categorize those same participants with Stage 2 hypertension. At the end of the study, the researchers found a 24% decrease in systolic blood pressure in patients receiving vitamin E and a 12.5% reduction in diastolic blood pressure.

The participants received 200 IU of vitamin E each day which the researchers concluded could be an effective long-term strategy to reduce blood pressure.¹⁷

Another study in 2002 evaluated blood pressure in 15,317 men and women over age 20 and found that antioxidant vitamins could be important in the prevention of high blood pressure.¹⁸ Interestingly, researchers in 2000 evaluated vitamin E supplementation in patients whose high blood pressure was controlled using medication. In this case, supplementation appeared to have no relevant effect.¹⁹ This study was funded in part by the drug company Bayer Italia.

More recently, a 2019 meta-analysis²⁰ published in the Journal of Human Hypertension analyzed systolic blood pressure, diastolic blood pressure and mean arterial pressure in individuals who received vitamin E supplementation. A review of the qualifying studies showed no significant effect on mean arterial pressure or diastolic blood pressure but a reduction in systolic blood pressure.

Another 2020 paper²¹ began with the premise that although randomized human trials have resulted in conflicting results with vitamin E supplementation, data show vitamin E deficiency is associated with an increased risk of cardiovascular events. These researchers suggest that the outcome of the human trials was significantly affected by the participants' comorbidities, genetic variations, gender and age.

In a review of the literature, they found that patients diagnosed with a myocardial infarction frequently had lower plasma levels of vitamin E. They suggest that short-term treatment shows promising results and, thus, using acute rather than chronic supplementation may provide positive clinical outcomes.

More Health Benefits From Vitamin E Antioxidant Capacity

Vitamin E contributes to even more health benefits. Millions of women are impacted by premenstrual syndrome (PMS), which was first described in 1931. In 2009,²² researchers estimated 80% to 90% of women in their reproductive years suffer from symptoms, and up to 8% of those experience severe symptoms.

A 2016 study showed that supplementing with vitamin D and E had a significant effect on PMS symptoms and was “an effective and affordable treatment” for the condition.²³ This supports a 1983 double-blind, randomized dose-response study²⁴ of 75 women that suggested supplementation may be valuable for women with symptoms of severe PMS.

Vitamin E is essential for reproductive health in the rodent population,²⁵ most notably in the development of the placenta. A 2018 paper²⁶ acknowledges that while researchers know it is necessary for fertility, studies are lacking on how it affects female reproductive health.

Vitamin E has also demonstrated neuroprotective properties, notably in a study²⁷ of 30 patients with glaucoma whose progression slowed while taking oral alpha-tocopherol acetate and a 2014 paper²⁸ that clarified the use of vitamin E in Alzheimer's disease, finding it delayed the onset and progression of Alzheimer's disease. A 2005 animal model²⁹ demonstrated that alpha-tocotrienol acted on molecular checkpoints to protect against stroke-induced neurodegeneration.

More Vitamin E Is Not Better

Vitamin E is a fat-soluble vitamin. The differences between water-soluble and fat-soluble vitamins affect how the vitamins are absorbed and stored. Your body can

excrete water-soluble vitamins when there is an excess of the vitamin. But fat-soluble vitamins are dissolved and stored in fat, which is how they travel through the small intestine and are distributed in the bloodstream. Because the vitamin is fat-soluble, it is **best absorbed** when you're eating a fat-rich meal.

And, because it's fat-soluble, your body stores any excess of the vitamin, which increases your risk of adverse side effects. According to the National Institutes of Health,³⁰ it's highly unlikely that you will experience adverse effects from consuming vitamin E-rich foods. However, high doses of alpha-tocopherol supplements can trigger side effects. Some common side effects include:³¹

Diarrhea	Weakness	Blurred vision
Nausea	Fatigue	Stomach cramps
Headache	Rash	Inhibition of platelet aggregation and bleeding

Another challenge associated with taking vitamin E supplements is the lack of data indicating synthetic supplements are beneficial. A 2012 study^{32,33} concluded that synthetic alpha-tocopherols found in vitamin E supplements had no discernible cancer protection but gamma- and delta-tocopherols found in food helped prevent colon, breast and prostate cancer.

Bear in mind that a supplement will not tell you it's synthetic, so you have to **know what to look for** on the label.

- Synthetic alpha-tocopherol is typically listed with a "dl" (i.e., dl-alpha-tocopherol)
- Nonsynthetic or naturally derived is typically listed with a "d" (d-alpha-tocopherol). Note that when vitamin E is stabilized by adding either succinic acid or acetic acid, the chemical name changes from tocopherol to tocopheryl (as in d-alpha-tocopheryl succinate, for example)

Vitamin supplements are chemical additions to your body. As with other supplements, there is the potential that vitamin E supplements can interact with different types of medication.³⁴

Because vitamin E inhibits platelet aggregation, using it when you're taking an anticoagulant or antiplatelet medication can increase the risk of bleeding. People taking antioxidant supplements, such as vitamin E, may find the supplement interferes with [statin medications](#), specifically simvastatin (Zocor) or niacin.

You Can't Go Wrong With Vitamin E-Rich Foods

Vitamin E is found in green leafy vegetables, nuts and some seeds. CNET lists foods that can help boost your vitamin E intake, including:³⁵

Sunflower seeds	Almonds	Spinach
Avocado	Asparagus	Mango
Pumpkin	Red bell pepper	Tomato
Hazelnuts	Kiwi	

[Grass-fed butter](#) is also a rich source of vitamin E in a highly absorbable form. Butter doesn't have to be a guilty pleasure. When butter is consumed as a whole food from a grass-fed source it contains many of the nutrients that your body needs. Some of these include:³⁶

- Vitamins A, K2 and E
- Lecithin for cholesterol metabolism and nerve health
- Antioxidants
- Iodine in a highly absorbable form

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