

Green Tea Boosts Heart and Brain Health

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STORY AT-A-GLANCE

- › Epigallocatechin-3-gallate (EGCG), an antioxidant found in green tea, has been shown to positively impact a number of illnesses and conditions, including obesity, Type 2 diabetes, heart disease and cancer
- › Long-term tea intake may improve your blood pressure. Those who regularly drank either green or black tea for 12 weeks had an average of 2.6 mm Hg lower systolic blood pressure and 2.2 mm Hg lower diastolic pressure compared to those who did not drink tea
- › Drinking three to four cups of green tea daily has been shown to promote heart and cardiovascular health, and aid in the prevention of arteriosclerosis, cerebral thrombus, heart attack and stroke
- › Recent research suggests EGCG in green tea can help prevent heart disease by dissolving arterial plaque
- › Other recent research has found EGCG also has the ability to inhibit amyloid beta plaque formation in the brain, associated with Alzheimer's disease

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High-quality teas — green tea in particular — contain polyphenol antioxidants recognized for their disease prevention and antiaging properties. Polyphenols can account for up to

30% of the dry leaf weight of green tea. Within the group of polyphenols are flavonoids, which contain catechins.

One of the most powerful catechins is epigallocatechin-3-gallate (EGCG), found in green tea. EGCG has been shown to positively impact a number of illnesses and conditions, including obesity, Type 2 diabetes, heart disease and cancer.

Tea Helps Lower Blood Pressure and Protect Your Heart

Previous research^{1,2} has shown long-term tea intake can improve your blood pressure readings. One systematic review of 25 randomized controlled trials found those who regularly drank either green or black tea for 12 weeks had an average of 2.6 mm Hg lower systolic blood pressure and 2.2 mm Hg lower diastolic pressure compared to those who did not drink tea.

Green tea provided the best results, followed by black tea. According to the authors, this reduction "would be expected to reduce stroke risk by 8%, coronary artery disease mortality by 5% and all-cause mortality by 4% at a population level ... These are profound effects and must be considered seriously in terms of the potential for dietary modification to modulate the risk of CVD [cardiovascular disease]."

While unable to determine exactly how much tea you need to drink to receive these benefits, a number of previous studies have suggested the ideal amount lies around three to four cups of tea per day.³ For example, one 2007 study⁴ found "clear evidence" showing that three or more cups of tea – in this case black tea – reduced the risk of heart disease.

Similarly, drinking three to four cups of green tea daily has been shown to promote heart and cardiovascular health,⁵ and to aid in the prevention of arteriosclerosis, cerebral thrombus, heart attack and stroke, courtesy of its ability to relax blood vessels, improve blood flow and protect against blood clots.⁶

EGCG Helps Prevent Plaque in Both Arteries and Brain

More recent research supports these earlier findings. Researchers at the University of Leeds and Lancaster University say the EGCG in green tea can help prevent heart disease by dissolving arterial plaque.^{7,8} (Other recent research⁹ has found this compound also has the ability to inhibit amyloid beta plaque formation in the brain, associated with Alzheimer's disease.)

According to these findings, EGCG actually alters the structure of amyloid fibrils formed by apolipoprotein A-1 (apoA-I) – the main protein component of high-density lipoprotein shown to accumulate in atherosclerotic plaques – when heparin (a naturally occurring anticoagulant produced by certain cells) is present. As reported by New Atlas:¹⁰

"[ApoA-I] is fundamental to the development of amyloid deposits seen in both Alzheimer's and atherosclerosis. The hypothesis in this new study is that EGCG can effectively alter the form of these amyloid fibrils, making them less toxic.

'The health benefits of green tea have been widely promoted and it has been known for some time that EGCG can alter the structures of amyloid plaques associated with Alzheimer's disease,' says one of the researchers on the project, David Middleton. 'Our results show that this intriguing compound might also be effective against the types of plaques which can cause heart attacks and strokes.'"

Unfortunately, the EGCG concentrations required to achieve the results found in this study are so high, you couldn't possibly get that amount from drinking green tea alone. However, the researchers believe the compound could eventually be used to make new drugs treatments. In light of such plans, it's worth remembering that too much of a good thing can be problematic. As noted in a scientific review published in 2010:¹¹

"... [T]here is emerging evidence that high doses of tea polyphenols may have adverse side effects. Given that the results of scientific studies on dietary components, including tea polyphenols, are often translated into dietary supplements, understanding the potential toxicities of the tea polyphenols is critical to understanding their potential usefulness ..."

Other Health Benefits of Green Tea

Green tea has also been found to have a number of other health benefits, courtesy of EGCG and other beneficial plant compounds. For example, studies have linked green tea consumption to:

Lower risk of cancer — Green tea polyphenols act on molecular pathways to shut down the production and spread of tumor cells, and discourage the growth of blood vessels that feed the tumors.¹² In addition to acting as an antiangiogenic and antitumor agent, EGCG has also been shown to modulate tumor cell response to chemotherapy.¹³

Improved weight loss — One 2010 study¹⁴ evaluating EGCG's potential in weight loss found a 300 milligram (mg) dose per day increased fat oxidation by 33 percent during the first two hours directly after eating. A cup of green tea will give you anywhere from 20 to 35 mg of EGCG, so to reach 300 mg by drinking green tea, you'd have to consume about six cups.

Importantly, in those given twice that dose (600 mg/day), this fat oxidation effect was only 20 percent, so more is not necessarily better. EGCG may also aid weight loss by inhibiting fat cell development and increasing fat excretion. A 2021 study showed that EGCG not only has anti-obesity potential, but “exhibits promising anticancer activity against cancer.”¹⁵

Lower risk of Type 2 diabetes — One animal study¹⁶ found that EGCG was as effective as the diabetic drug Avandia in moderately diabetic mice, suggesting green tea, or a high-quality green tea extract, could be helpful for the prevention and/or treatment of diabetes.

Enhanced brain function and prevention of age-associated brain degeneration — As mentioned earlier, EGCG appears to decrease the production of beta-amyloid, which can overaccumulate in your brain, resulting in nerve damage and memory loss over time.¹⁷ In one 2005 study,¹⁸ researchers injected pure EGCG into mice genetically

programmed to develop Alzheimer's; the results showed a decrease of as much as 54 percent in the plaque associated with Alzheimer's.

Reduced pain and inflammation related to rheumatoid arthritis.¹⁹

Protection against glaucoma and other eye diseases – In one study,²⁰ scientists analyzed eye tissue from rats that drank green tea and found that eye tissues such as the lens and retina had in fact absorbed green tea catechins. The retina absorbed the highest levels of gallic catechin, while the aqueous humor (the fluid in the chambers of your eye) soaked up the highest amounts of EGCG.

According to the authors, oxidative stress causes biological disturbances such as DNA damage and activation of proteolytic enzymes that can lead to tissue cell damage or dysfunction and, eventually, ophthalmic diseases.

Treatment of genital and anal warts – A botanical ointment containing green tea extract was found to be an effective treatment for external genital and anal warts, according to the results of one 2008 study.²¹ Genital and anal warts are caused by certain strains of human papillomavirus, and there has been a lack of effective, well tolerated treatments.

The researchers assigned over 500 adults with up to 30 warts to receive either an ointment containing sin catechins, or a placebo. In the sin catechins groups, warts cleared completely in roughly 57 percent of patients, compared to just 34 percent of subjects in the control group.

Reduced risk of autoimmune diseases²² – One caveat: Those with Th2-dominant autoimmune disorders (such as asthma and allergies, many cancers, ulcerative colitis, lupus and many viral infections) may be wise to avoid concentrated green tea products as it may upregulate Th2.

Those with Th1-dominant conditions (such as multiple sclerosis, Hashimoto's, psoriasis and rheumatoid arthritis), on the other hand, may benefit, as green tea

inhibits Th1. To learn more about this, see this "Green Tea Health Risks" article by Precision Nutrition.²³

Improved exercise performance — In one study,²⁴ mice given green tea extract for 10 weeks improved their endurance exercise performance by as much as 24 percent.

Improved digestion.²⁵

Healthier gums — A 2012 study showed that green tea is "a boon for periodontal and general health."²⁶

Green Tea Is Part of a Healthy Diet

While some of the studies used far higher amounts of EGCG than you'd be able to comfortably get from drinking tea, if you enjoy it, a few cups a day could certainly be a healthy addition to your diet. Just be sure to drink your green tea "straight." Adding milk and/or sugar will counter many of the benefits of the tea. One exception is lemon juice.

Research²⁷ suggests you can actually increase the benefits of green tea by adding vitamin C — such as a squirt of lemon juice — as the ascorbic acid boosts the amount of catechins available for your body to absorb. In fact, citrus juice increased available catechin levels more than fivefold, causing 80 percent of tea's catechins to remain bioavailable.

Green tea is the least processed kind of tea, so it also contains the highest amounts of EGCG of all tea varieties — provided the tea has not been oxidized, which is a common problem. The easiest sign to look for when evaluating a green tea's quality is its color.

If your green tea is brown rather than green, it's likely been oxidized, which can damage or destroy many of its most valuable compounds. Besides being an excellent source of antioxidants, green tea is also packed with vitamins A, D, E, C, B, B5, H and K, manganese and other beneficial minerals such as zinc, chromium and selenium.

Matcha Tea and Tulsi – Two Superior Tea Choices

My personal favorite is Matcha green tea. It has a wonderful flavor and superior nutrient content, as it has not been damaged through processing. It contains the entire ground tea leaf, and can contain over 100 times the EGCG provided from regular brewed green tea.

The best Matcha green tea comes from Japan and is steamed rather than roasted or pan-fried. As a result, Matcha green tea retains all the nutrient-rich value possible from the tea leaf. The tea leaves are ground into powder, which you stir directly into hot water, resulting in a bright green beverage.

A cold version option that is perfect for summer is to make Matcha lemonade. Simply dissolve the powder in hot water; chill, then add lemon or lime juice. A small amount of stevia can be added for sweetness. Serve with ice. Matcha powder can also be added to juices, yogurt and smoothies. For a number of different recipes, see "How to Make Matcha Tea Smoothies" by Natural Holistic Health.²⁸ As an added boon, the chlorophyll in Matcha acts as a natural detoxifier.

Another delicious, healthy option is Indian Tulsi tea, which contains hundreds of beneficial phytochemicals. Working together, these compounds possess potential antioxidant, adaptogenic and immune-enhancing properties that can fight stress and help promote your general health in multiple ways, including:

- Bolstering your immune system
- Providing you with a calming effect and relief from occasional stress
- Promoting healthy metabolism
- Helping maintain optimal blood sugar levels
- Supporting normal cholesterol levels

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