



Patient Resource: Green Tea



What is green tea?

Green tea is dried or steamed leaves of the plant *Camellia sinensis*. Epigallocatechin gallate (EGCG) is the main active ingredient.

Why do people use green tea?

Green tea is most commonly used:

- To prevent cancer or a recurrence of cancer
- To slow disease progression
- As an antioxidant

What are the side effects of green tea?

Side effects are mostly mild, rare and related to the caffeine content. The most common side effects include gastrointestinal and central nervous system complaints, including excess gas, upset stomach, nausea, vomiting, heartburn, abdominal pain, insomnia, diarrhea, muscle pain, dizziness, headache, anxiety, fatigue, agitation, restlessness and confusion. Serious side effects have been noted in a few studies, including elevated liver enzymes, stomach pain, insomnia, confusion, diarrhea, anorexia and fatigue. Large doses can cause nausea and hypertension (high blood pressure) and have been found to be associated with increased neurological toxicity, which might be related to higher caffeine levels in the blood.

How does green tea work?

Green tea works by initiating a series of biological events, which include activating pro-apoptotic (natural cell death) signals, anti-growth signals and anti-proliferation signals. Green tea has also been shown to inhibit the expression of genes that have the potential to cause cancer (oncogenes).

Does green tea work?

Several studies have assessed the potential for green tea to reduce the risk of cancer. The available evidence supports either a decrease in cancer risk with an increase in green tea consumption, or no association of cancer risk with green tea consumption. There is some evidence to suggest the risk of cancer might be further reduced with higher doses of green tea, although one study also documented an increased risk of pancreatic cancer with 5 or more cups of green tea per day.

Studies have documented the potential for a small reduction in risk (especially among heavy green tea drinkers) of cancers of the breast, prostate, lung, liver, ovaries, endometrium, gall bladder and bile duct. Regular green tea consumption levels (>3 cups per day) may offer protection against tobacco carcinogens for smokers, if green tea is consumed throughout the smoking period. Data are inconclusive for gastric cancer, colorectal cancer and oral cancer.

Data are inconclusive around the potential for green tea to reduce prostate specific antigen (PSA) levels or other tissue biomarkers (e.g., HGF, VEGF and IFG-I). A small number of studies suggest that green tea consumption can improve quality of life. Limited evidence also suggests the potential for topically applied green tea to provide protection from the sun, including UVB light. Finally, preliminary data suggests that green tea consumption could help control the spread of breast cancer cells, and reduce the absolute lymphocyte count for people diagnosed with chronic lymphocytic leukemia.

Disclaimer

The OICC has prepared this monograph, as part of a series of monograph development, to share results of a review of the research evidence related to common therapies and products used within cancer patient care. The following monograph is designed to provide evidence-based research and neither advocates for or against the use of a particular therapy. Every effort is made to ensure the information included in this monograph is accurate at the time it is published. Prior to using a new therapy or product, always consult a licensed health care provider. The information in this monograph should not be interpreted as medical advice nor should it replace the advice of a qualified health care provider.



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Is green tea safe?

Green tea has been shown to enhance some chemotherapies, but interact negatively with others. Lab studies show a synergistic effect with doxorubicin, gemcitabine (GEM), mitomycin C, and 5-fluorouracil; but, negative effects with bortezomib and other boronic acid-based proteasome inhibitors. People should contact a qualified health professional before using green tea at the same time as chemotherapy.

Interactions are possible with some drugs and natural health products, including angiotensin-converting enzyme (ACE) inhibitors, alzheimer's agents, antiandrogens, anticoagulants and antiplatelets (e.g., warfarin and Coumadin), antidiabetics, antihypertensives, cardiovascular agents, cytochrome P450-metabolized agents, diuretics, estrogen, grapefruit, hepatotoxic agents, iron salts, neurologic agents, and p-glycoprotein-regulated agents.

Some interactions are related to the caffeine content in green tea, and so caution is advised when taking other caffeinated agents at the same time as with caffeinated green tea, for example coffee, colas, guarana, cola nut, and yerba mate.

*Green tea should not be taken in any form by people with atrial fibrillation, or with a known allergy or hypersensitivity to tea (*Camellia sinensis*), its constituents, caffeine, tannins, or members of the Theaceae family. Caffeinated green tea should be avoided by pregnant and lactating women, as well as children. Green tea should not be taken on an empty stomach.*

Caution should be taken by postmenopausal women and people with or at risk of: high or low blood pressure; heart disease; gastrointestinal disorders; liver disorders; neurological or psychiatric conditions; renal or electrolyte disorders; respiratory disorders; diabetes; iron deficiency; bleeding disorders; hormone disorders; or, folic acid deficiency.

What is the recommended dose of green tea?

A range of green tea doses have been used across research studies, most commonly 400-800mg of green tea catechins per day. Positive effects of green tea on cancer risk have been documented with larger doses, more than 7 cups per day. One study has documented the maximum tolerated dose to be 3 g/m², which is equivalent to 20 cups of tea.

At the OICC, people are typically prescribed between 800-1,000 mg green tea catechins per day.

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