



cancer.org | 1.800.227.2345

Marijuana and Cancer

Marijuana is the name given to the dried buds and leaves of varieties of the *Cannabis sativa* plant, which can grow wild in warm and tropical climates throughout the world and be cultivated commercially. It goes by many names, including pot, grass, cannabis, weed, hemp, hash, marihuana, ganja, and dozens of others.

Marijuana has been used in herbal remedies for centuries. Scientists have identified many biologically active components in marijuana. These are called *cannabinoids*. The two best studied components are the chemicals *delta-9-tetrahydrocannabinol* (often referred to as THC), and *cannabidiol* (CBD). Other cannabinoids are being studied.

At this time, the US Drug Enforcement Administration (DEA) lists marijuana and its cannabinoids as Schedule I controlled substances. This means that they cannot legally be prescribed, possessed, or sold under federal law. Whole or crude marijuana (including marijuana oil or hemp oil) is not approved by the US Food and Drug Administration (FDA) for any medical use. But the use of marijuana to treat some medical conditions is legal under state laws in many states.

Dronabinol, a pharmaceutical form of THC, and a man-made cannabinoid drug called nabilone are approved by the FDA to treat some conditions.

Types of marijuana compounds

Different compounds in marijuana have different actions in the human body. For example, delta-9-tetrahydrocannabinol (THC) seems to cause the "high" reported by marijuana users, and also can help relieve [pain](#)¹ and [nausea](#)², reduce inflammation, and can act as an antioxidant. Cannabidiol (CBD) can help treat seizures, can reduce anxiety and paranoia, and can counteract the "high" caused by THC.

Different cultivars (strains or types) and even different crops of marijuana plants can

have varying amounts of these and other active compounds. This means that marijuana can have different effects based on the strain used.

The effects of marijuana also vary depending on how marijuana compounds enter the body. The most common ways to use marijuana are in food (edible marijuana) and by smoking or vaping it (inhaled marijuana):

- **Edible marijuana:** When taken by mouth, such as when it's used in cooking oils, drinks (beer, tea, vodka, soda), baked goods (biscuits, brownies, cookies), and candy, the THC is absorbed poorly and can take hours to be absorbed. Once it's absorbed, it's processed by the liver, which produces a second psychoactive compound (a substance that acts on the brain and changes mood or consciousness) that affects the brain differently than THC. It's important to know that the amount of THC in foods that have had marijuana added to them is often unknown and getting too much THC might cause symptoms of overdose.
- **Inhaled marijuana:** When marijuana is smoked or vaporized, THC enters the bloodstream and goes to the brain quickly. The second psychoactive compound is produced in small amounts, and so has less effect. The effects of inhaled marijuana fade faster than marijuana taken by mouth.

How can marijuana affect symptoms of cancer?

A number of small studies of smoked marijuana found that it can be helpful in treating nausea and vomiting from [cancer chemotherapy](#)³.

A few studies have found that inhaled (smoked or vaporized) marijuana can be helpful treatment of [neuropathic pain](#)⁴ (pain caused by damaged nerves).

Smoked marijuana has also helped improve food intake in HIV patients in studies.

There are no studies in people of the effects of marijuana oil or hemp oil.

Studies have long shown that people who took marijuana extracts in clinical trials tended to need less pain medicine.

More recently, scientists reported that THC and other cannabinoids such as CBD slow growth and/or cause death in certain types of cancer cells growing in lab dishes. Some animal studies also suggest certain cannabinoids may slow growth and reduce spread of some forms of cancer.

There have been some early clinical trials of cannabinoids in treating cancer in humans and more studies are planned. While the studies so far have shown that cannabinoids can be safe in treating cancer, they do not show that they help control or cure the disease.

Relying on marijuana alone as treatment while avoiding or delaying conventional medical care for cancer may have serious health consequences.

Possible harmful effects of marijuana

Marijuana can also pose some harms to users. While the most common effect of marijuana is a feeling of euphoria ("high"), it also can lower the user's control over movement, cause disorientation, and sometimes cause unpleasant thoughts or feelings of anxiety and paranoia.

Smoked marijuana delivers THC and other cannabinoids to the body, but it also delivers harmful substances to users and those close by, including many of the same substances found in tobacco smoke.

Because marijuana plants come in different strains with different levels of active compounds, it can make each user's experience very hard to predict. The effects can also differ based on how deeply and for how long the user inhales. Likewise, the effects of ingesting marijuana orally can vary between people. Also, some chronic users can develop an unhealthy dependence on marijuana.

Cannabinoid drugs

There are chemically pure drugs based on marijuana compounds that have been approved in the US for medical use.

- **Dronabinol (Marinol®/Syndros®)** is a medicine containing delta-9-tetrahydrocannabinol (THC) and is approved by the US Food and Drug Administration (FDA) to treat nausea and vomiting caused by cancer chemotherapy as well as weight loss and poor appetite in patients with AIDS.
- **Nabilone (Cesamet®)** is a synthetic cannabinoid that acts much like THC. It can be taken by mouth to treat nausea and vomiting caused by cancer chemotherapy when other drugs have not worked.

Nabiximols is a cannabinoid drug still under study in the US. It's a mouth spray made up of a whole-plant extract with THC and cannabidiol (CBD) in an almost one to one

mix. It's available in Canada and parts of Europe to treat pain linked to cancer, as well as muscle spasms and pain from multiple sclerosis (MS). It's not approved in the US at this time, but it's being tested in clinical trials to see if it can help a number of conditions.

How can cannabinoid drugs affect symptoms of cancer?

Based on a number of studies, dronabinol can be helpful for reducing nausea and vomiting linked to chemotherapy.

Dronabinol has also been found to help improve food intake and prevent weight loss in patients with HIV. In studies of cancer patients, though, it wasn't better than placebo or another drug (megestrol acetate).

Nabiximols has shown promise for helping people with cancer pain that's unrelieved by strong pain medicines, but it hasn't been found to be helpful in every study done. Research is still being done on this drug.

Side effects of cannabinoid drugs

Like many other drugs, the prescription cannabinoids, dronabinol and nabilone, can cause side effects and complications.

Some people have trouble with increased heart rate, decreased blood pressure (especially when standing up), dizziness or lightheadedness, and fainting. These drugs can cause drowsiness as well as mood changes or a feeling of being "high" that some people find uncomfortable. They can also worsen depression, mania, or other mental illness. Some patients taking nabilone in studies reported hallucinations. The drugs may increase some effects of sedatives, sleeping pills, or alcohol, such as sleepiness and poor coordination. Patients have also reported problems with dry mouth and trouble with recent memory.

Older patients may have more problems with side effects and are usually started on lower doses.

People who have had emotional illnesses, paranoia, or hallucinations may find their symptoms are worse when taking cannabinoid drugs.

Talk to your doctor about what you should expect when taking one of these drugs. It's a good idea to have someone with you when you first start taking one of these drugs and after any dose changes.

What does the American Cancer Society say about the use of marijuana in people with cancer?

The American Cancer Society supports the need for more scientific research on cannabinoids for cancer patients, and recognizes the need for better and more effective therapies that can overcome the often debilitating side effects of cancer and its treatment. The Society also believes that the classification of marijuana as a Schedule I controlled substance by the US Drug Enforcement Administration imposes numerous conditions on researchers and deters scientific study of cannabinoids. Federal officials should examine options consistent with federal law for enabling more scientific study on marijuana.

Medical decisions about pain and symptom management should be made between the patient and their doctor, balancing evidence of benefit and harm to the patient, the patient's preferences and values, and any laws and regulations that may apply.

The American Cancer Society Cancer Action Network (ACS CAN), the Society's advocacy affiliate, has not taken a position on legalization of marijuana for medical purposes because of the need for more scientific research on marijuana's potential benefits and harms. However, ACS CAN opposes the smoking or vaping of marijuana and other cannabinoids in public places because the carcinogens in marijuana smoke pose numerous health hazards to the patient and others in the patient's presence.

Hyperlinks

1. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/pain.html
2. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/nausea-and-vomiting.html
3. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/chemotherapy.html
4. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/peripheral-neuropathy.html

References

Abrams DI, Jay CA, Shade SB, et al. Cannabis in painful HIV-associated sensory neuropathy: a randomized placebo-controlled trial. *Neurology*. 2007;68(7):515-521.

Ahmedzai S, Carlyle DL, Calder IT, Moran F. Anti-emetic efficacy and toxicity of nabilone, a synthetic cannabinoid, in lung cancer chemotherapy. *Br J Cancer*. 1983;48(5):657-663.

American College of Physicians. Supporting research into the therapeutic role of marijuana. (Position paper, 2008.) Accessed at www.acponline.org/advocacy/where_we_stand/other_issues/medmarijuana.pdf on March 4, 2015.

Bhattacharyya S, Crippa JA, Allen P, et al. Induction of psychosis by {delta}9-tetrahydrocannabinol reflects modulation of prefrontal and striatal function during attentional salience processing. *Arch Gen Psychiatry*. 2012;69(1):27-36.

Beal JE, Olson R, Laubenstein L, et al. Dronabinol as a treatment for anorexia associated with weight loss in patients with AIDS. *J Pain Symptom Manage*. 1995;10(2):89-97.

Beal JE, Olson R, Lefkowitz L, et al. Long-term efficacy and safety of dronabinol for acquired immunodeficiency syndrome-associated anorexia. *J Pain Symptom Manage*. 1997;14(1):7-14.

Cannabis-In-Cachexia-Study-Group, Strasser F, Luftner D, Possinger K, et al. Comparison of orally administered cannabis extract and delta-9-tetrahydrocannabinol in treating patients with cancer-related anorexia-cachexia syndrome: a multicenter, phase III, randomized, double-blind, placebo-controlled clinical trial from the Cannabis-In-Cachexia-Study-Group. *J Clin Onc*. 2006;24:3394-3400.

Ellis RJ, Toperoff W, Vaida F, et al. Smoked medicinal cannabis for neuropathic pain in HIV: a randomized, crossover clinical trial. *Neuropsychopharmacology*. 2009;34(3):672-680.

Guzmán M, Duarte MJ, Blázquez C, et al. A pilot clinical study of Delta9-tetrahydrocannabinol in patients with recurrent glioblastoma multiforme. *Br J Cancer*. 2006;95(2):197-203.

Haney M, Rabkin J, Gunderson E, Foltin RW. Dronabinol and marijuana in HIV(+) marijuana smokers: acute effects on caloric intake and mood. *Psychopharmacology*. (Berl). 2005;181:170-178.

Haney M, Gunderson EW, Rabkin J, et al. Dronabinol and marijuana in HIV-positive marijuana smokers. Caloric intake, mood, and sleep. *J Acquir Immune Defic Syndr*. 2007;45(5):545-554.

Herman TS, Einhorn LH, Jones SE, et al. Superiority of nabilone over prochlorperazine as an antiemetic in patients receiving cancer chemotherapy. *N Engl J Med*. 1979;300(23):1295-1297.

Jatoi A, Windschitl HE, Loprinzi CL, et al. Dronabinol versus megestrol acetate versus combination therapy for cancer-associated anorexia: a North Central Cancer Treatment Group study. *J Clin Oncol*. 2002;20(2):567-573.

Johnson JR, Burnell-Nugent M, Lossignol D, et al. Multicenter, double-blind, randomized, placebo-controlled, parallel-group study of the efficacy, safety, and tolerability of THC:CBD extract and THC extract in patients with intractable cancer-related pain. *J Pain Symptom Manage*. 2010;39(2):167-179.

Johnson JR, Lossignol D, Burnell-Nugent M, Fallon MT. An open-label extension study to investigate the long-term safety and tolerability of THC/CBD oromucosal spray and oromucosal THC spray in patients with terminal cancer-related pain refractory to strong opioid analgesics. *J Pain Symptom Manage*. 2013;46(2):207-218.

Karst M, Salim K, Burstein S, et al. Analgesic effect of the synthetic cannabinoid CT-3 on chronic neuropathic pain: a randomized controlled trial. *JAMA*. 2003;290:1757-1762.

Klein RFX. Analysis of "marijuana edibles - food products containing marijuana or marijuana extracts - an overview, review, and literature survey. *Microgram Journal*. 2017;14:1-4..

Koppel BS, Brust JC, Fife T, et al. Systematic review: efficacy and safety of medical marijuana in selected neurologic disorders: report of the Guideline Development Subcommittee of the American Academy of Neurology. *Neurology*. 2014;82(17):1556-1563.

Kramer JL. Medical marijuana for cancer. *CA Cancer J Clin*. 2014 Dec 10.

Meiri E, Jhangiani H, Vredenburgh JJ, et al. Efficacy of dronabinol alone and in combination with ondansetron versus ondansetron alone for delayed chemotherapy-induced nausea and vomiting. *Curr Med Res Opin*. 2007;23(3):533-543.

Musty RE, Rossi R. Effects of Smoked Cannabis and Oral 9-Tetrahydrocannabinol on Nausea and Emesis After Cancer Chemotherapy: A Review of State Clinical Trials. *Journal of Cannabis Therapeutics*. 2001; 1(1): 29-56.

National Cancer Institute. Cannabis and Cannabinoids (PDQ®) Health Professional Version, updated 12/17/14. Accessed at

www.cancer.gov/cancertopics/pdq/cam/cannabis/healthprofessional on March 4, 2015.

Portenoy RK, Ganae-Motan ED, Allende S, et al. Nabiximols for opioid-treated cancer patients with poorly-controlled chronic pain: a randomized, placebo-controlled, graded-dose trial. *J Pain*. 2012;13(5):438-449.

Radwan MM, Elsohly MA, Slade D, et al. Biologically active cannabinoids from high-potency *Cannabis sativa*. *J Nat Prod*. 2009;72(5):906-911.

Rog DJ, Nurmikko TJ, Young CA. Oromucosal delta9-tetrahydrocannabinol/cannabidiol for neuropathic pain associated with multiple sclerosis: an uncontrolled, open-label, 2-year extension trial. *Clin Ther*. 2007;29(9):2068-2079.

Ross SA, ElSohly MA, Sultana GN, et al. Flavonoid glycosides and cannabinoids from the pollen of *Cannabis sativa* L. *Phytochem Anal*. 2005;16(1):45-48.

Smith PF. New approaches in the management of spasticity in multiple sclerosis patients: role of cannabinoids. *Ther Clin Risk Manag*. 2010;6:59-63.

Tramér MR, Carroll D, Campbell FA, et al. Cannabinoids for control of chemotherapy induced nausea and vomiting: quantitative systematic review. *BMJ*. 2001;323:16-21.

Ware MA, Wang T, Shapiro S, et al. Smoked cannabis for chronic neuropathic pain: a randomized controlled trial. *CMAJ*. 2010;182(14):E694-701.

Wilsey B, Marcotte T, Deutsch R, et al. Low-dose vaporized cannabis significantly improves neuropathic pain. *J Pain*. 2013;14(2):136-148.

Woolridge E, Barton S, Samuel J, et al. Cannabis use in HIV for pain and other medical symptoms. *J Pain Symptom Manage*. 2005;29:358-367.

Last Revised: August 3, 2022

Written by

The American Cancer Society medical and editorial content team
(www.cancer.org/cancer/acs-medical-content-and-news-staff.html)

Our team is made up of doctors and oncology certified nurses with deep knowledge of cancer care as well as journalists, editors, and translators with extensive experience in medical writing.

American Cancer Society medical information is copyrighted material. For reprint requests, please see our Content Usage Policy (www.cancer.org/about-us/policies/content-usage.html).

cancer.org | 1.800.227.2345