



National Institute
on Drug Abuse

DrugFacts

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Is Marijuana Medicine?

What is medical marijuana?

The term *medical marijuana* refers to using the whole unprocessed marijuana plant or its basic extracts to treat a disease or symptom. The U.S. Food and Drug Administration (FDA) has not recognized or approved the marijuana plant as medicine.



However, scientific study of the chemicals in marijuana, called *cannabinoids*, has led to two FDA-approved medications that contain cannabinoid chemicals in pill form. Continued research may lead to more medications.

Because the marijuana plant contains chemicals that may help treat a range of illnesses or symptoms, many people argue that it should be legal for medical purposes. In fact, a growing number of states have legalized marijuana for medical use. Read more about

marijuana-related state laws at www.whitehouse.gov/ondcp/state-laws-related-to-marijuana.

Why isn't the marijuana plant an FDA-approved medicine?

The FDA requires carefully conducted studies (clinical trials) in hundreds to thousands of human subjects to determine the benefits and risks of a possible medication. So far, researchers have not conducted enough large-scale clinical trials that show that the benefits of the marijuana plant (as opposed to its cannabinoid ingredients) outweigh its risks in patients it is meant to treat.

Read more about the various physical, mental, and behavioral effects of marijuana in *DrugFacts: Marijuana* at www.drugabuse.gov/publications/drugfacts/marijuana.

What are cannabinoids?

Cannabinoids are chemicals related to *delta-9-tetrahydrocannabinol* (THC), marijuana's main mind-altering ingredient. Other than THC, the marijuana plant contains more than 100 other cannabinoids. Scientists as well as illegal manufacturers have produced many cannabinoids in the lab. Some of these cannabinoids are extremely

What is CBD?

There is growing interest in the marijuana chemical *cannabidiol* (CBD) to treat certain conditions such as childhood epilepsy, a disorder that causes a child to have violent seizures. Therefore, scientists have been specially breeding marijuana plants and making CBD in oil form for treatment purposes. These drugs may be less desirable to recreational users because they are not intoxicating.

powerful and have led to serious health effects when abused.

The body also produces its own cannabinoid chemicals. They play a role in regulating pleasure, memory, thinking, concentration, body movement, awareness of time, appetite, pain, and the senses (taste, touch, smell, hearing, and sight).

How might cannabinoids be useful as medicine?

Currently, the two main cannabinoids from the marijuana plant that are of medical interest are THC and CBD.

THC increases appetite and reduces nausea. The FDA-approved THC-based medications are used for these purposes. THC may also decrease pain, inflammation (swelling and redness), and muscle control problems.

CBD is a cannabinoid that does not affect the mind or behavior. It may be useful in reducing pain and inflammation, controlling epileptic seizures, and possibly even treating mental illness and addictions.

NIH-funded and other researchers are continuing to explore the possible uses of THC, CBD, and other cannabinoids for medical treatment.

For instance, recent animal studies have shown that marijuana extracts may help kill certain cancer cells and reduce the size of others. Evidence from one cell culture study suggests that purified extracts from whole-plant marijuana can slow the growth of cancer cells from one of the most serious types of brain tumors. Research in mice showed that treatment with purified extracts of THC and CBD, when used with radiation, increased the cancer-killing effects of the radiation (Scott, 2014).

Scientists are also conducting preclinical and clinical trials with marijuana and its extracts to treat numerous diseases and conditions, such as the following:

- autoimmune diseases (diseases that weaken the immune system):
 - HIV/AIDS
 - multiple sclerosis (MS), which causes gradual loss of muscle control

Are People with Health- and Age-Related Problems More Vulnerable to Marijuana's Risks?

Regular medicinal use of marijuana is a fairly new practice. For that reason, its effects on people who are weakened because of age or illness are still relatively unknown. Older people and those suffering from diseases such as cancer or AIDS could be more vulnerable to the drug's harmful effects. Scientists need to conduct more research to determine if this is the case.

- Alzheimer's disease, which causes loss of brain function, affecting memory, thinking, and behavior
- inflammation
- pain
- seizures
- substance use disorders
- mental disorders



Read more about NIDA's marijuana research at www.drugabuse.gov/drugs-abuse/marijuana/marijuana-research-nida and www.drugabuse.gov/drugs-abuse/marijuana/nida-research-therapeutic-benefits-cannabis-cannabinoids.

What medications contain cannabinoids?

Two FDA-approved drugs, dronabinol and nabilone, contain THC. They treat nausea caused by chemotherapy and increase appetite in patients with extreme weight loss caused by AIDS.

The United Kingdom, Canada, and several European countries have approved nabiximols (Sativex®), a mouth spray containing THC and CBD. It

treats muscle control problems caused by MS. The United States is conducting clinical trials for its safe use in treating cancer pain.

Although it has not yet undergone clinical trials, scientists have recently created Epidiolex, a CBD-based liquid drug to treat certain forms of childhood epilepsy.

Points to Remember

- The term *medical marijuana* refers to treating a disease or symptom with the whole unprocessed marijuana plant or its basic extracts.
- The FDA has not recognized or approved the marijuana plant as medicine.
- However, scientific study of the chemicals in marijuana called *cannabinoids* has led to two FDA-approved medications in pill form.
- Cannabinoids are chemicals related to *delta-9-tetrahydrocannabinol* (THC), marijuana's main mind-altering ingredient.
- The body also produces its own cannabinoid chemicals.
- Currently, the two main cannabinoids from the marijuana plant that are of interest for medical treatment are THC and *cannabidiol* (CBD).
- Scientists are conducting preclinical and clinical trials with marijuana and its extracts to treat numerous diseases and conditions.
- Two FDA-approved marijuana drugs are dronabinol and nabilone, both used to treat nausea and boost appetite.

Learn More

For more information on marijuana and its health effects, visit:

www.drugabuse.gov/publications/research-reports/marijuana

www.drugabuse.gov/publications/drugfacts/marijuana

For more information on marijuana and cannabinoid research conducted by NIDA and NIH, visit:

www.drugabuse.gov/marijuana-research-nida

www.drugabuse.gov/drugs-abuse/marijuana/nida-research-therapeutic-benefits-cannabis-cannabinoids

For more information on state laws related to marijuana, visit:

www.whitehouse.gov/ondcp/state-laws-related-to-marijuana

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References

Scott KA, Dalgleish AG, Liu WM. The combination of cannabidiol and Δ 9-tetrahydrocannabinol enhances the anticancer effects of radiation in an orthotopic murine glioma model. *Mol Cancer Ther.* 2014;13(12):2955-67.