

Epilepsy & Seizure Disorders: Cannabinoids and CBD Research Overview

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Epilepsy is a group of neurological disorders, characterized by seizures, which affect 1 in 26 people in the United States. Studies have shown cannabidiol (CBD), a major cannabinoid found in cannabis, is effective at significantly decreasing the frequency of seizures and has the potential of offering complete seizure freedom.

Overview of Epilepsy & Seizure Disorders

Epilepsy is a central nervous system disorder that can range in severity from being relatively benign to disabling and even life threatening. In epilepsy, nerve cell activity in the brain becomes disrupted, causing seizures, convulsions, strange sensations and a loss of consciousness. The occurrence of a seizure doesn't necessarily mean a person has epilepsy. Experiencing two or more seizures, however, is call for the diagnosis of epilepsy.

According to the National Institute of Neurological Disorders and Stroke, the possible causes of epilepsy include an abnormality in brain wiring, an imbalance of neurotransmitters (nerve-signaling chemicals), changes in important brain cells called channels, or any combination of these factors. Genetics, head trauma, brain conditions, infectious diseases, prenatal injury, and developmental disorders can initiate these causes.

There is no cure for epilepsy, so treatment focus remains on limiting seizures through medication, diet adjustments, devices, and in some cases, surgery. It's important to be treated for epilepsy, as seizures can cause you to fall and are dangerous when you're driving or swimming. Severe childhood epilepsies that are characterized by frequent

seizures can cause delays in neurodevelopment and an impaired quality of life. In rare cases, experiencing abnormally prolonged seizures can lead to unexplained death.

Findings: Effects of Cannabinoids and CBD on Epilepsy & Seizure Disorders

A number of scientific reviews analyzing previously-published research on cannabis' effect on epilepsy conclude that a major cannabinoid found in cannabis, [cannabidiol \(CBD\)](#), is a well-tolerated and promising therapeutic treatment that has demonstrated the ability to reduce or even eliminate seizures^{1,2,12,13}. In a preclinical trial, the administration of cannabis provided significant anticonvulsant effects in mice and rats⁶.

CBD's ability to decrease or eliminate seizures is due to its effects on the [endocannabinoid system](#). CBD interacts with the system's cannabinoid receptor 1 (CB₁); The CB₁ receptor then dampens neurotransmission and produces an overall reduction in neuronal excitability^{7,14}.

Research also finds that cannabis is effective in the treatment of severe pediatric epilepsy disorders like Dravet syndrome, Doose syndrome and Lennox-Gastaut syndrome. In one questionnaire study, 85% of parents reported a reduction in their child's seizure frequency with cannabis treatment. Out of those parents, 11% of them responded that their child has reached complete seizure freedom, while 42% reported a greater than 80% reduction in seizure frequency. The parents also reported additional beneficial effects, such as increased alertness, better mood and improved sleep¹¹. Another survey found that CBD-enriched cannabis brought about a reduction in seizure frequency in 85% of children with epilepsy, while 14% experienced complete seizure freedom. The children also reported an improvement in sleep (53%), alertness (71%), and mood (63%) while being treated with CBD⁸. One case report analyzing a young epileptic girl found that medical cannabis brought the child's seizure frequency from nearly 50 convulsive seizures per day to 2-3 nocturnal convulsions per month. In

addition, the child was able to wean from the additional anti-epileptic drugs she had been taking⁹.

Traditional medicines used to treat epilepsy often come with a number of adverse side effects. However, the cannabinoids found in cannabis have shown to produce anticonvulsant effects in preclinical and preliminary human studies while producing fewer adverse effects than other anti-epileptic drugs³. A questionnaire study found that parents tried an average of 12 different anti-epileptic drugs, due to ineffectiveness or unacceptable side effects, before finding gentle effectiveness with cannabis¹¹.

States That Have Approved Medical Cannabis for Epilepsy & Seizure Disorders

Nearly all of the states with medical cannabis have included epilepsy as a qualified condition. These states include: [Alabama](#) (debilitating epileptic conditions), [Connecticut](#), [Delaware](#) (intractable epilepsy), [Florida](#), [Georgia](#) (seizure disorder), [Iowa](#) (intractable epilepsy), [Louisiana](#), [Maine](#), [Mississippi](#) (intractable epilepsy), [Missouri](#) (intractable epilepsy), [New Hampshire](#), [New Jersey](#) (seizure disorders), [New Mexico](#), [New York](#), [North Carolina](#) (intractable epilepsy), [North Dakota](#), [Ohio](#), [Oklahoma](#) (pediatric epilepsy), [Pennsylvania](#), [South Carolina](#) (Dravet syndrome, Lennox-Gastaut syndrome, refractory epilepsy), [Texas](#) (intractable epilepsy), [Utah](#) (intractable epilepsy), [Virginia](#) (intractable epilepsy), [West Virginia](#), [Wisconsin](#) (seizure disorders), and [Wyoming](#) (intractable epilepsy).

In addition, several states approve medical cannabis to specifically treat seizures. These states include: [Alaska](#), [Arizona](#), [Arkansas](#), [California](#), [Colorado](#), [Delaware](#), [Florida](#), [Hawaii](#), [Louisiana](#), [Maryland](#), [Michigan](#), [Minnesota](#), [Montana](#), [Nevada](#), [New Hampshire](#), [North Dakota](#), [Ohio](#), [Oregon](#), [Pennsylvania](#) (intractable seizures), [Rhode Island](#), [Tennessee](#) (intractable seizures), [Vermont](#), and [Washington](#).

The state of [Massachusetts](#) will consider allowing medical cannabis to be used for the treatment of Dravet syndrome if it's determined in writing by a qualifying patient's physician.

In [Washington D.C.](#), any condition can be approved for medical cannabis as long as a DC-licensed physician recommends the treatment.

Recent Studies on Cannabinoids and CBD's Effect on Epilepsy & Seizure Disorders

CBD-enriched cannabis caused a reduction in seizure frequency in 85% of children, while 14% reported complete seizure freedom. Children also saw improvements in sleep (53%), alertness (71%), and mood (63%).

Perceived efficacy of cannabidiol-enriched cannabis extracts for treatment of pediatric epilepsy: A potential role for infantile spasms and Lennox-Gastaut syndrome.

<http://www.ncbi.nlm.nih.gov/pubmed/25935511>

Cannabis treatment resulted in a reduction in seizure frequency in 84% of children, while 11% reported complete seizure freedom. Additional beneficial effects included increased alertness, better mood, and improved sleep.

Report of a parent survey of cannabidiol-enriched cannabis use in pediatric treatment-resistant epilepsy.

<http://www.ncbi.nlm.nih.gov/pubmed/24237632>

Cannabis provided significant anticonvulsant effects in mice and rats.

Cannabidiol-rich cannabis extracts are anticonvulsant in mouse and rat via a CB1 receptor-independent mechanism.

<http://www.ncbi.nlm.nih.gov/pubmed/23902406>

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