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# Cannabidiol (CBD) — what we know and what we don't

POSTED AUGUST 24, 2018, 6:30 AM , UPDATED AUGUST 27, 2019, 5:21 PM



[Peter Grinspoon, MD](#)

Contributor

Cannabidiol (CBD) has been recently covered in the media, and you may have even seen it as an add-in booster to your post-workout smoothie or morning coffee. What exactly is CBD? Why is it suddenly so popular?



## How is cannabidiol different from marijuana?

CBD stands for cannabidiol. It is the second most prevalent of the active ingredients of cannabis (marijuana). While CBD is an essential component of [medical marijuana](#), it is derived directly from the hemp plant, which is a cousin of the marijuana plant. While CBD is a component of marijuana (one of hundreds), by itself it does not cause a "high." According to a report from the [World Health Organization](#), "In humans, CBD exhibits no effects indicative of any abuse or dependence potential. ... To date, there is no evidence of public health related problems associated with the use of pure CBD."

## Is cannabidiol legal?

CBD is readily obtainable in most parts of the United States, though its exact legal status is in flux. All 50 states have laws legalizing CBD with varying degrees of restriction, and while the federal government still considers CBD in the same class as marijuana, it doesn't habitually enforce against it. In December 2015, the FDA eased the regulatory requirements to allow researchers to conduct CBD trials. Currently, many people obtain CBD online without a medical cannabis license. The [government's position](#) on CBD is confusing, and depends in part on whether the CBD comes from hemp or marijuana. The legality of CBD is expected to change, as there is currently bipartisan consensus in Congress to make the hemp crop legal which would, for all intents and purposes, make CBD difficult to prohibit.

## The evidence for cannabidiol health benefits

CBD has been touted for a wide variety of health issues, but the strongest scientific evidence is for its effectiveness in treating some of the cruelest childhood epilepsy syndromes, such as Dravet syndrome and Lennox-Gastaut syndrome (LGS), which typically don't respond to antiseizure medications. In numerous studies, CBD was able to reduce the number of seizures, and in some cases it was able to stop them altogether. Videos of the effects of CBD on these children and their seizures are readily available on the Internet for viewing, and they are quite striking. Recently the FDA approved the [first ever cannabis-derived medicine](#) for these conditions, Epidiolex, which contains CBD.

CBD is commonly used to address anxiety, and for patients who suffer through the misery of insomnia, studies suggest that CBD may help with both falling asleep and staying asleep.

CBD may offer an option for treating different types of chronic pain. A study from the *European Journal of Pain* showed, using an animal model, CBD applied on the skin could help lower pain and inflammation due to arthritis. Another study demonstrated the mechanism by which CBD inhibits inflammatory and neuropathic pain, two of the most difficult types of chronic pain to treat. More study in humans is needed in this area to substantiate the claims of CBD proponents about pain control.

## Is cannabidiol safe?

Side effects of CBD include nausea, fatigue and irritability. CBD can increase the level in your blood of the blood thinner coumadin, and it can raise levels of certain other medications in your blood by the exact same mechanism that grapefruit juice does. A significant safety concern with CBD is that it is primarily marketed and sold as a supplement, not a medication. Currently, the FDA does not regulate the safety and purity of

dietary supplements. So you cannot know for sure that the product you buy has active ingredients at the dose listed on the label. In addition, the product may contain other (unknown) elements. We also don't know the most effective therapeutic dose of CBD for any particular medical condition.

## The bottom line on cannabidiol

Some CBD manufacturers have come under government scrutiny for wild, indefensible claims, such that CBD is a cure-all for cancer, which it is not. We need more research but CBD may be prove to be an option for managing anxiety, insomnia, and [chronic pain](#). Without sufficient high-quality evidence in human studies we can't pinpoint effective doses, and because CBD is currently is mostly available as an unregulated supplement, it's difficult to know exactly what you are getting. If you decide to try CBD, talk with your doctor — if for no other reason than to make sure it won't affect other medications you are taking.

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COMMENTS

**39**

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## Comments:

[POSTED OCTOBER 17TH, 2018 AT 8:25 PM](#)

**Jo Bowen**

Should one take as gospel the equivalencies between CBD and Grapefruit juice? Eg, if grapefruit juice affects the metabolism of Omeprazole and I am taking Omeprazole, should I avoid adding CBD to the mix?



[POSTED OCTOBER 19TH, 2018 AT 8:27 PM](#)

**Peter Grinspoon, MD**

Nothing about CBD is "gospel" yet; much more studies need to be done. Omeprazole is pretty safe, by and large; I think the biggest concern with CBD would be with medications where an altered, irregular dosage could be dangerous, such as blood thinners...

[POSTED OCTOBER 17TH, 2018 AT 9:55 AM](#)

**Hank Waterman**

I suffered two concussions within a space of 7 weeks: once after falling on ice, and once in a traffic accident. That was about 18 months ago and I still suffer from post-concussion syndrome, which is barely tolerable. Hyper-sensitivity to light and sound, exhaustion, some dizziness, some cognitive impairment.

I hesitate to try anything that might further impair my cognitive function but I am willing to give cannabis a try (now that it is legal in Canada).

Is there any good research on the effects of cannabis on a concussed brain?

Thanks

Hank Waterman



POSTED OCTOBER 17TH, 2018 AT 1:59 PM

**Peter Grinspoon, MD**

There is some evidence that cannabis is neuroprotective, and can help protect against Traumatic Brain Injury:

<https://www.ncbi.nlm.nih.gov/pubmed/25264643>

This needs to be studied more!

POSTED OCTOBER 20TH, 2018 AT 9:49 AM

**Hank Waterman**

Thanks for the response, Dr Grinspoon.

It's a bit confusing to me. It looks like if one has THC in their system prior to the trauma, some of the damage might be mitigated. (Am I wrong on this?)

I'm wondering specifically about the use of cannabis after the injury has occurred.

Is there any research on this that you're aware of?

Thanks.

HW

POSTED OCTOBER 5TH, 2018 AT 4:46 PM

**Tressa Molloy**

I've been fighting chronic pain for over 35 years. It's like being in prison. I just started cbd oil and want to learn everything I can about it. My only hope.



POSTED OCTOBER 8TH, 2018 AT 10:14 AM

**Peter Grinspoon, MD**

I hope it helps. Good luck!

POSTED SEPTEMBER 29TH, 2018 AT 5:30 AM

**Tim Andersen**

I need some clarification here. How can CBD be "derived" from the hemp plant, when the Marijuana already contains CBD? Furthermore the hemp plant and the marijuana plant, is the "same" plant, in that "hemp" is the male version, Marijuana is "female" version.

Or would you say I'm wrong in this assumption?

On another note, CBD helps PREVENT nausea, fatigue and irritability. It's not some side-effect of it?

I'm not at all an expert, so I will not act like I know it all, and you are just wrong. However, I do want to know, what you base these claims on?



[POSTED OCTOBER 1ST, 2018 AT 9:06 AM](#)

**Peter Grinspoon, MD**

Thank you for your questions. Marijuana and hemp are two extremely different strains of the same cannabis sativa plant that have been bred over thousands of years to have entirely different purposes. (Hemp is not the male version of the marijuana plant.) They both contain CBD. Hemp only contains CBD whereas marijuana contains CBD and perhaps a hundred or so other chemicals with a variety of functions, such as THC, the molecule that makes people "high". Any medicine can have different effects on different people. For example, Benadryl makes some people sleepy yet can make others wide-awake. So, it is not inconsistent for a particular medicine to cause a symptom in one person and to help alleviate it in another. So while many people experience relaxation with CBD, so people do experience the "paradoxical" effect of irritability.

[POSTED SEPTEMBER 23RD, 2018 AT 3:46 PM](#)

**Sen. Connie Johnson**

I can concur based on real time experience with my Mother who is bed bound with an irreparable fracture to her hip prosthesis. We have reduced her morphine/opioid meds substantially using high CBD and high THC versions. 2x/day. She also eats gluten free muffins containing the oil. She thoroughly enjoys her alternatives and requests them regularly.



[POSTED SEPTEMBER 24TH, 2018 AT 10:01 AM](#)

**Peter Grinspoon, MD**

Thank you for your comment. It is fantastic that she is able to reduce her use of opioids. This is much safer, and makes for a better quality of life, and I'm sure you are seeing!

[POSTED SEPTEMBER 11TH, 2018 AT 10:59 AM](#)

**Dr. Rachna Patel**

@Shelley Latin I'm a physician who has treated patients with both hemp & cannabis based CBD. And, what you're saying is in concurrence with the clinical outcomes I've seen in my practice.

1. For certain conditions, such as Shingles and Spinal Stenosis, some amount of THC is needed to effectively relieve the pain. CBD, on it's own, doesn't cut it.
2. In regards to CBD eliminating pain, it depends on what level of pain the patient starts with. If the patient starts with mild to moderate levels of pain, then, it's certainly possible to eliminate the pain. But, if the patient starts with severe pain, then it's less likely, I'd say.
3. In the best case scenarios, my patients have completely eliminated the use of opioids and just use CBD on an as needed basis to manage their pain.

Hope that helps.

With Gratitude,  
Dr. Patel



[POSTED SEPTEMBER 11TH, 2018 AT 3:25 PM](#)

**Peter Grinspoon, MD**

Very helpful! Thank you for your thoughts. Absolutely consistent with what I'm seeing in clinic as well.

[POSTED OCTOBER 2ND, 2018 AT 9:09 PM](#)

## Jason

Cannabidiol may partially normalize alterations in parahippocampal, striatal, and midbrain function associated with the CHR state. As these regions are critical to the pathophysiology of psychosis, the influence of CBD at these sites could underlie its therapeutic effects on psychotic symptoms.

<https://jamanetwork.com/journals/jamapsychiatry/article-abstract/2697762>



POSTED OCTOBER 3RD, 2018 AT 4:53 PM

**Peter Grinspoon, MD**

Thank you for sharing this interesting and important article!

POSTED SEPTEMBER 7TH, 2018 AT 6:14 AM

**Dr Glenda (surname withheld due to fear)**

Thank you. I am 81 and started the CBD drops night and morning. I sleep better and no longer suffer the excruciating pain from diverticulitis. I saw somewhere that for my asthma I need the THC so got some (totally illegal here in South Africa). I think it is helping. The diagnosis of COPD was made some years ago and as a health psychologist I do all I can to remain healthy for my 97th birthday!! (Both my grandmother and greatgrandmother did so I believe I will too).



POSTED SEPTEMBER 7TH, 2018 AT 4:27 PM

**Peter Grinspoon, MD**

Thank you for sharing your experiences. Happy 97th birthday in advance!

POSTED SEPTEMBER 7TH, 2018 AT 4:37 AM

**Justin Kenp**

Great Stuff.. It seems, you have researched a lot before posting the blog. Thank you for sharing such a important information, as rarely people know this use of CBD. I know about CBD but not aware the CBD can be use in this way as well.



POSTED SEPTEMBER 7TH, 2018 AT 4:28 PM

**Peter Grinspoon, MD**

Thank you for your comments!

POSTED SEPTEMBER 5TH, 2018 AT 10:57 AM

**Shelley Latin**

I have read about studies from Europe (not very specific I know) that suggest CBD might work better for some people if combined with some level of THC. Also, the getting high part can be helpful, although not for everybody, of course. A second point – I don't hear very much about CBD eliminating or almost eliminating pain for people with severe pain. Helpful, but, so far at least, it doesn't seem that CBDs can replace opioids or substantially reduce pain for all chronic pain patients. Maybe someday.



[POSTED SEPTEMBER 7TH, 2018 AT 4:30 PM](#)

**Peter Grinspoon, MD**

To my understanding, neither CBD nor THC are effective for “severe” pain; rather, they work better for mild to moderate chronic pain. Often, with severe pain, the dosage of opiates can be decreased with concomitant use of medical cannabis or CBD and that decrease in dose makes their use safer. Concurrent use of THC does increase the analgesic effect of CBD, but it also adds the “high” which some people do not want as a side effect.

[POSTED OCTOBER 7TH, 2018 AT 12:52 PM](#)

**Breyanna**

I agree. I have had 4 spine surgeries, I'm only 22 and I have chronic Sciatica and peripheral nerve pain, I use just thc + CBD and that's it. During my surgeries i had to use low dose opioids but using thc and CBD helped me not have to use so much!



[POSTED OCTOBER 8TH, 2018 AT 10:14 AM](#)

**Peter Grinspoon, MD**

I'm glad that you are finding it so useful!



[POSTED SEPTEMBER 4TH, 2018 AT 4:03 PM](#)

**Peter Grinspoon, MD**

It is definitely a problem with all nutritional medications and supplements — they aren't rigorously regulated and it's difficult to know what dosage you are actually getting. I wish they were far better regulated, both in terms of dose and quality, and in terms of the claims they are allowed to make...



[POSTED SEPTEMBER 4TH, 2018 AT 3:59 PM](#)

**Peter Grinspoon, MD**

That is an unfortunate situation; you can find another hospital system, advocate for change within that hospital system, or you can educate yourself about this issue and try these medications on your own (which is what a lot of patients end up doing unfortunately...).



[POSTED SEPTEMBER 4TH, 2018 AT 3:57 PM](#)

**Peter Grinspoon, MD**

It can raise you levels of blood thinners and, as such, the levels should be monitored more closely when you start using CBD, but it can't replace the need for blood thinners.



[POSTED SEPTEMBER 4TH, 2018 AT 2:16 PM](#)

**Peter Grinspoon, MD**

CBD and THC interact competitively at the receptor level, so it is true that CBD can lessen the “high” that THC causes.



POSTED SEPTEMBER 4TH, 2018 AT 2:12 PM

**Peter Grinspoon, MD**

Thank you for sharing your experiences with CBD.



POSTED SEPTEMBER 4TH, 2018 AT 2:12 PM

**Peter Grinspoon, MD**

Yes, Hemp-derived CBD has no THC and is less likely to have side effects but some people claim that, for this exact reason, it has less efficacy.

POSTED SEPTEMBER 2ND, 2018 AT 11:16 PM

**Chris M**

There are hundreds of chemicals found in both Hemp and Cannabis. CBD is only one noteworthy analyte. CBD likely acts as an antagonist to THC and will likely reduce the euphoric properties of THC. THC has very important therapeutic effects that are both noteworthy and novel as well.

Unfortunately due to the disappointing and down right inaccurate position of the federal government in classifying Cannabis as a schedule one drug, most research institutions risk federal funding if they conduct real research on Cannabis. This has dramatically limited the potential for real research by real scientists to be conducted. That research is critical to better understanding the multitude of therapeutic effects of the various chemical constituents found in Cannabis.

Because of the vast diversity of chemicals found in Cannabis(THC, CBD, CBN, CBG, etc) isolating a specific chemical can paint an inaccurate picture of the medical efficacy of plant. In fact, Dronabinol(synthetic THC), as an example, has turned out to be a pretty dangerous drug.

Although I'm no physician, and am not qualified to recommend any drugs for any specific medical purposes, and you should consult your doctor when considering the consumption of anything that may be medicinal: If you're looking to experiment with CBD products, you might consider looking for CBD products that are "whole plant" extract based from very high CBD cultivars. If you're in a State that has a legal Cannabis system, you may also find more therapeutic benefits from non-hemp derived CBD products.

There is quite a bit of NIH data available on CBD, and other chemicals found in Cannabis:

<https://www.ncbi.nlm.nih.gov/pmc/?term=CBD>

There are likely very complex relationships also occurring between various Cannabinoids in Cannabis that may lead to certain medical efficacy. That is important to remember when considering the consumption of products that contain Cannabinoids. There is an attractiveness to isolating a specific chemical, researching it, patenting synthetic derivatives, and marketing specific drugs. That said, the relationships are complex, will likely take years to understand, and many patients I've met appear to find the most medical benefit from a diverse group of Cannabinoids whose interactions are not particularly well understand, but the results are hard to argue with.

POSTED SEPTEMBER 1ST, 2018 AT 9:45 PM

**Dolores Hark**

I use this for my anxiety and for my arthritis. The topical works great for my chronic neck pain. The best way to go is to get your own raw, tested material and use it in whatever form you like. It's quite easy to make your own extract. This has worked better for me, rather than relying on a purchased, untested product – where some seem to work and others are a waste. But even with those that work, of course the cost is ridiculous and not affordable, thanks to all these corporate-pleasing laws in place, not there for the people – don't delude yourselves.

A few years back I recall unethical big pharma trying to stick a patent on the CBD extraction progress. Now I am not surprised they take this natural healing substance and stick it in a pill form – annoying US medical industry.

Also to my understanding it is already now legally to grow industrial hemp in all 50 states from which the more pure CBD products are derived.

It makes no sense to me that something that helps with anxiety has an irritability side effect – as a lot of my anxiety is co-mingled naturally with irritability. Further, I have noticed none of these side effects, given that if you become fatigued or sleepy, you adjust dose the next day. So I don't call that a side effect – rather – an effect of taking too much.

But let's face it. This is all a great disgrace that any of this is illegal and is simply an artifact of our corrupt, corporate-driven political system, still in place to this day.

I am laughing at the annoying pharma industry – it's the pills that are killing us, not the weeds. SHAME on anyone who participates in this corrupt medical system and shames people for wanting their rights back to nature.

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[POSTED SEPTEMBER 1ST, 2018 AT 10:23 AM](#)

**Susan Hancock**

Sub-lingual CBD drops have helped me enormously with sleeping and with radiation damage pain. I have a cancer that spread from the pelvic area to my sacrum and sciatic nerve and whilst the chemo and radiotherapy saved my life I have been taking MST (morphine derivative) for nerve pain ever since. My tumours are presently all quiet and last March I decided I wanted to stop taking the pain relief drugs, fearing dementia. CBD oil was recommended by my son who has arthritis and, for me, it really works. It's so good to read an article that isn't put out by a CBD sales site – I wish it could be properly prescribed and regulated (I'm in the UK) in order to have confidence with purity and dosage.

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[POSTED AUGUST 31ST, 2018 AT 4:51 PM](#)

**Kevin Smith**

Great article, except that clarification is needed regarding (potential) side-effects.

From what I understand, CBD derived from the hemp plant does not have the side effects mentioned above, other than possibly to help reduce the amount of Coumadin/Warfarin needed – either way, a patient on this drug needs to be monitored and regularly tested anyway with their doctor. CBD derived from the marijuana plant (will contain THC) may have them, I do not know, maybe that's why you mention them. One of the many reasons people take Hemp CBD is that it does NOT have the side effects! People take the Hemp version to help with feelings of fatigue, irritability & anxiousness, it does cause it! It helps to bring the body into balance.

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[POSTED AUGUST 27TH, 2018 AT 2:42 PM](#)

**Beverly Wilkerson**

Consumer Reports recently did Some testing on CBD, They only showed 6 with results of their testing. You might want to look it up.

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[POSTED AUGUST 27TH, 2018 AT 1:02 PM](#)

**Geoff in NJ**

So what are my choices if my doctor (and all the others in her practice) are prohibited by their hospital corporation from assisting patients figure out whether it just might work?

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[POSTED AUGUST 27TH, 2018 AT 12:44 PM](#)

**Jami Vaughan**

I would love further information regarding the blood thinner/coumadin reaction. I'm interested in trying to get off blood thinners from the western world as a potential bleeding issue later in life. (Gastric ulcers/varices caused by blood thinners).

I've been on Warfarin 14 years already due to Ischemic stroke, I'm under 40.

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[POSTED AUGUST 26TH, 2018 AT 8:48 PM](#)



## Robert Kauai

I recently was a guest at a medical marijuana educational event that highlighted the work of researcher Michael Backes. During his presentation he made a statement about CBD that I have never heard anywhere else that CBD is “regulating” (my word) the effects of THC. I asked the Nurse Practitioner at the event, Ivy Lou Hibbitt of Certicann.com, what he meant by that and she said it was her understanding of Michael’s comment that he takes CBD to reduce the psychoactive effects of THC. Has this property of CBD, that it can lessen psychoactive effects, ever been researched elsewhere?

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POSTED AUGUST 26TH, 2018 AT 10:25 AM

## Kim

CBD has been able to erase my permanent nerve damaged pain in my left leg. Previously only Fentanyl did that. However, neither one has helped my chronic back pain. Ice and pain meds helps my back pain although I feel like I’m treating like a drug addict to get my very needed Tylenol 4-3times a day only. Thanks, Kim

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POSTED AUGUST 25TH, 2018 AT 6:08 PM

## Carrie

Great article, except that clarification is needed regarding (potential) side-effects.

From what I understand, CBD derived from the hemp plant does not have the side effects mentioned above, other than possibly to help reduce the amount of Coumadin/Warfarin needed – either way, a patient on this drug needs to be monitored and regularly tested anyway with their doctor. CBD derived from the marijuana plant (will contain THC) may have them, I do not know, maybe that’s why you mention them. One of the many reasons people take Hemp CBD is that it does NOT have the side effects! People take the Hemp version to help with feelings of fatigue, irritability & anxiousness, it does cause it! It helps to bring the body into balance.

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