

Dosage and Titration



PRODUCT TYPE

Cannabidiol (CBD) does not cause an intoxicating high like THC. CBD can actually lessen or neutralize the THC high, depending on how much of each compound is present in a particular product. A greater ratio of CBD to THC means less chance of euphoria.

There are three types of resin-rich cannabis and cannabis products:

TYPE 1
CBD-dominant – High CBD, low THC (non-euphoric cannabis)
TYPE 2
CBD & THC Balanced - Mixed CBD and THC cultivars (intoxicating, but not as intense as THC-dominant variants)
TYPE 3
THC-dominant – High THC, low CBD (intoxicating cannabis variants)

DOSING AND TITRATION GUIDELINES

Optimizing your medical use of cannabis may entail some experimentation. Unlike conventional pharmaceutical products, cannabis is available in many varieties that differ in potency and composition.

Some patients effectively use tiny amounts of cannabis, while others use higher doses. Adult patients achieve therapeutic effects at 1 mg of total cannabinoids daily, while others have consumed over 2000 mgs daily without adverse effects.

MICRODOSING FOR BEGINNERS

Microdosing involves taking very small doses of a drug, which entails the consumption of a sub-psychoactive or slightly psychoactive dose of cannabis, to obtain the positive benefits without incurring the negative side effects of a large dose.

A microdose can be as little as 1/20th of a normal dose. Microdosing works well with cannabis, where it can provide relief from anxiety and depression, allowing a patient to have a sharp and clear focus and help with insomnia – all at very low doses.

MANAGING PSYCHOACTIVITY

The successful use of cannabis as a medicine largely depends on managing the intoxicating properties of THC. Many people enjoy the cannabis high; for others it is unpleasant. A patient's sensitivity to THC, the main intoxicating component of cannabis, is key to implementing an effective treatment dosage.

“START LOW, GO SLOW”

In the medical cannabis world, the common cautionary advice is to ‘start low and go slow.’ This refers to starting on a low dosage, reviewing how that affects the patient's body and mind, and then determining to increase or decrease the dosage. This is known as dose titration. The ability to dose titrate is particularly important when taking medication such as THC.

The adage “start low and go slow” is applied to cannabis therapy in general, and THC titration in particular, as discussed by Caroline MacCallum and Ethan Russo in a January 2018 article in the European Journal of Internal Medicine. The authors, who are both physicians, provide sensible guidelines for health professionals and patients regarding the judicious administration of (Type 1) THC-dominant medicinal preparations.

If a new patient is going to smoke or vape THC-rich cannabis, Russo and MacCallum suggest a start with a single inhalation and a gap of 15 minutes before inhaling again. The effects of inhaled cannabis usually can be felt within a few minutes, thereby providing quick relief of acute distress. If need be, the patient can inhale once every 15 to 30 minutes “until desired symptom control is achieved.”

Oral administration can take 60 to 90 minutes before the effects of a single dose are felt.

MacCallum and Russo suggest a carefully titrated regimen for consumption of ingestible THC-rich cannabis products. They recommend that patients with little or no experience using cannabis should start by ingesting the equivalent of 1.25 to 2.5 mg of THC shortly before bedtime for two days. If there are no unwanted side effects, increase the bedtime dose of THC by another 1.25 to 2.5 mg for the next two days. Continue to increase the dose of THC by an additional 1.25 to 2.5 mg every other day until the desired effects are achieved.

If there are adverse side effects, reduce the dose of THC to the prior amount that was well tolerated.

To avoid over-consumption, it is advised that patients start with a low dose and wait for the active ingredients to come into full effect before slowly increasing the dose over time. Also referred to as titration, the low-and-slow method of determining dosage aims for maximum benefit without adverse effects.

DOSAGE FOR DIFFERENT PRODUCT TYPES

TYPE 1 - THC

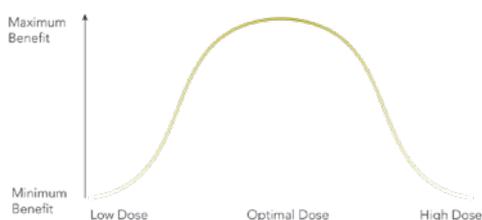
For adequate symptom relief, some patients may need to ingest a cannabis preparation two or three times during daylight hours in addition to their night-time regimen. Cautious titration is urged: On days 1 and 2, start with one dose of no more than the equivalent of 5 mg THC; on days 3 and 4, increase to 2.5 mg THC twice a day; and, if well tolerated, up the dose incrementally to a total of 15 mg THC (divided equally throughout the day). If symptoms recur, then try a twice-daily regimen.

Type 1 Titration Table

Days	Morning (mg)	Midday (mg)	Evening (mg)	Total Daily Dosage (mg)
1			5	5
2			5	5
3			7.5	7.5
4			7.5	7.5
5			10	10
6			10	10
7			12.5	12.5
8			12.5	12.5
9			15	15
10			15	15
11			17.5	17.5
12			17.5	17.5
13			20	20
14			20	20

“Doses exceeding 20-30 mg/day [of THC] may increase adverse events or induce tolerance without improving efficacy,” MacCallum and Russo warn.

Adverse events mainly pertain to THC and are dose-dependent. Very high doses are more likely to cause unwanted side effects. For most medications, a higher dose will produce a stronger therapeutic effect. THC and other cannabis components have biphasic properties, meaning that low and high doses generate opposite effects. Low doses of cannabis tend to stimulate whilst high doses sedate.



This means that starting low and gradually increasing the dose of cannabis will produce stronger effects at first. But after a certain point dosage increases can result in weaker therapeutic effects, and an increase in side effects according to the literature. It is important to note that every individual responds to THC differently, and builds tolerance at different rates.

There are negative side effects that can result from over-consumption. Sulak observes that “symptoms of cannabis overdose closely mirror the symptoms one would expect cannabis to relieve at appropriate doses: nausea, vomiting, diarrhea, sweating, spasms, tremors, anxiety, panic attacks, paranoia, dis-coordination, and disturbed sleep. Extreme overdoses can lead to hallucinations and even acute psychosis.” Side effects are experienced for a few hours and then disappear. These effects are not permanent.

By introducing small amounts of THC into a patient, and increasing the dosage slowly, the risk of negative side effects is minimized. The goal is to take a large enough dose of THC to achieve therapeutic effects that is also small enough to minimize negative side effects.

If a patient starts experiencing any of the uncomfortable side effects of THC (for example anxiety, dry mouth, appetite overstimulation), revert to a lower dose. If symptoms aren't controlled by this lower dose, explore adding CBD to the regimen. CBD can curb the uncomfortable side effects of THC, and provide additional symptom relief.

When ingesting THC-rich cannabis with little CBD it is recommended to be cautious when trying to find the right dose. Microdosing as small as 2.5mg of THC can relieve symptoms without inducing euphoria. If tolerated well, then consider increasing the amount of THC slowly each day to reach a total of 15mg divided equally throughout the entire day. Exceeding cumulative doses of 20-30mg of THC per day, or 10+mg in a single dose may cause unwanted side effects.

TYPE 2 - THC : CBD BALANCED:

CBD and THC both have remarkable medicinal attributes, and they work better in combination than in isolation. CBD can synergistically enhance THC's anti-inflammatory and pain killing properties, while reducing its unwanted side effects.

A 2010 report in the British Journal of Pharmacology analyzed the effects of THC and CBD alone and in



combination in an animal model of colitis. This preclinical study concluded that “CBD increased some effects of an ineffective THC dose to the level of an effective one.”

This is one of the many gifts of CBD: It can magnify the medicinal impact of a small amount of THC so that a patient need not consume an intoxicating dose to experience THC’s therapeutic benefits.

Type 2 Titration Table

Days	Morning (mg)	Midday (mg)	Evening (mg)	Total Daily Dosage (mg)
1			5	5
2			5	5
3			7.5	7.5
4			7.5	7.5
5			10	10
6			10	10
7			12.5	12.5
8			12.5	12.5
9			15	15
10			15	15
11			17.5	17.5
12			17.5	17.5
13			20	20
14			20	20

Per the table above, titrate upward by 2.5 mg THC every 2-3 days. If symptoms recur, then a twice-daily regimen should be started, using 11 mg twice per day.

A clinical study published by CRP in the Journal of Pain in 2012 examined the efficacy of different dosage levels of Sativex, a cannabis-derived sublingual spray with 1:1 CBD:THC ratio, which is an approved medication in two dozen countries (but not in the United States). Of 263 cancer patients who were not finding pain relief with opiates, the group that received 21 mg of Sativex each day experienced significant improvements in pain levels, more so than the group that received 52 mg Sativex daily. And those given even higher doses (83 mg daily) reduced their pain no better than a placebo, but they experienced more adverse effects.

Although many patients do well at the lowest effective dose, some do benefit from a high dose cannabis oil regimen. Often these patients follow a regimen that includes a substantial amount of CBD as well as THC. By reducing THC’s intoxicating effects, CBD makes high potency cannabis oil treatment easier to manage. If high doses are necessary, steady titration over several weeks will help build tolerance to THC’s intoxicating effects.

Cannabis therapy is personalized medicine. There is no single CBD:THC ratio or dosage that is optimal for everyone. As little as 2.5 mg of CBD combined with a small amount of THC can have a therapeutic effect. If necessary, much higher doses of good quality CBD-rich formulations are safe and well tolerated.

For patients new to cannabis, it may be best to start with low doses of a CBD-rich remedy (with little THC), and increase the dosage (and, if necessary, the amount of THC) step by step. A few small doses over the course of the day should be taken, rather than a single large dose. A low THC product may not always be the best treatment option. A more balanced combination of CBD and THC could have a greater impact than CBD or THC alone.

In essence, the goal is to administer consistent, measurable doses of a CBD-rich remedy with as much THC as a person is comfortable with. Experiment, observe the effects, and adjust

the amount of CBD and THC until one finds the sweet spot with the right combination of both compounds.

TYPE 3 - FULL SPECTRUM EXTRACTS RICH IN CBD

The ideal CBD daily target is 75mg – 100 mg. There is no maximum dose for CBD, and dosing is very flexible (20 mg/kg/day was used in the Dravet trial, per the literature). Above 50 mg/day CBD – consider adding some THC.

Type 3 Titration Table

Days	Morning (mg)	Midday (mg)	Evening (mg)	Total Daily Dosage (mg)
1	10	10	10	30
2	15	15	15	45
3	15	15	15	45
4	20	20	20	60
5	20	20	20	60
6	25	25	25	75
7	25	25	25	75
8	30	30	30	90
9	30	30	30	90
10	35	35	35	105
11	35	35	35	105
12	40	40	40	120
13	40	40	40	120
14	50	50	50	150

Microdosing cannabis is a feasible option for those patients who prefer to avoid the side-effect of intoxication. High dose CBD therapy is a method of healing without the high.

As a general rule, Type 3 CBD-dominant cannabis (with very low THC) will not induce intoxication. Neither will a pure CBD isolate (with no THC). But CBD isolates lack critical aromatic terpenes and other cannabinoids, which interact synergistically to enhance CBD’s therapeutic benefits. Single molecule cannabinoids are not as versatile or as effective as whole plant formulations.

Preclinical research indicates that full spectrum CBD-rich cannabis oil is effective at much lower doses and has a wider therapeutic window than a CBD isolate. In animal studies CBD isolates require very high and precise doses to be effective. Problematic drug interactions are also more likely with a high-dose CBD isolate than with whole plant cannabis.

CBD-rich full-spectrum cannabis oil, containing small amounts of THC, has been shown in preclinical studies to be more effective at lower doses and has a wider array of therapeutic effects than pharmaceutical-grade, pure CBD.

What is the Recommended Dose for CBD?

While there is no officially recommended dose for CBD, there are various clinical studies, research papers and resources from which such information can be drawn: -

Preventative: Up to 10mg/day

- **Cancer: 500mg-1000+mg/day or 10mg/kg/day (Source: Cannabidiol as potential anticancer drug)**
- **Chronic Pain: 2.5 - 20mg/day (Source: Cannabinoids as novel anti-inflammatory drugs)**
- **Epilepsy: 200 - 300mg/day or 20mg/kg (Source: Trial of Cannabidiol for Drug-Resistant Seizures in the Dravet Syndrome)**
- **Glaucoma: 15 - 40mg/day (Source: Neuroprotective Effect of(-) 9-Tetrahydrocannabinol and Cannabidiol in N-Methyl-d-Aspartate-Induced Retinal Neurotoxicity)**

- **Sleep Disorders: 50 - 150mg/day (Source: Effectiveness of Cannabidiol Oil for Pediatric Anxiety and Insomnia as Part of Posttraumatic Stress Disorder: A Case Report)**
- **Schizophrenia: 400 - 1250mg/day (Source: A Four-week Clinical Trial Investigating Efficacy and Safety of Cannabidiol as a Treatment for Acutely Ill Schizophrenic Patients)**

CBD oil typically does not cause side-effects at these doses, but some patients may experience minor drowsiness or dizziness. If this happens, revert to a lower dose.

MEDICAL CBD FOR CHILDREN AND ADULTS

Single molecule CBD has now become a FDA-approved pharmaceutical for pediatric seizure disorders. The product is branded as Epidiolex and has been developed by GW Pharmaceuticals.

Children and adults metabolize drugs differently. It may seem counterintuitive, but young children can tolerate high doses of cannabis oil concentrates, including THC-rich formulations, which might be unsuitable for an adult. It is therefore not a good idea to calculate dosage for an adult based on what works for a child.

If 1 mg/kg of CBD is an appropriate starting dose for a child, and an adult weighs 15 times more than the child, one should not assume that the correct CBD starting dose for the adult is 15mg/kg of body weight. That could be too high a dose. While CBD has no known adverse effects at any dose, an excessive amount of CBD may be less effective therapeutically than a moderate dose.

PERSONALIZED MEDICINE

Unlike conventional pharmaceutical products, cannabis is available in many varieties that differ in potency and composition. Determining a therapeutic dose and THC level for each patient is highly individualized.

Dosage variables to consider are as follows: -

Cannabis experience: - Has the patient used cannabis before? A veteran user may need a higher dose than a new user. Or a chronic user might need to reboot his or her sensitivity to cannabis (see Dr. Dustin Sulak's cannabis "sensitization protocol" on Healer.com).

Time of day: - Optimizing the therapeutic use of cannabis may entail using products with different CBD:THC ratios at different times of the day - more CBD for daylight hours, more THC at night.

Preventive dosing: - Prolonged low dose therapy may be advantageous for managing chronic symptoms or to prevent disease recurrence. Preclinical studies indicate that cannabinoids have neuroprotective and cardioprotective properties that could limit the damage of a traumatic brain injury or a heart attack.

WHAT IS THE RIGHT DOSE ?

- Titrating upwards should stop when a patient experiences a therapeutic response (e.g. a marked reduction in pain or improvement in function which is well controlled) or adverse effects.
- Most patients will respond to < 30 mg of THC per day.

The best dose of cannabis may require some trial and error. There may be a greater therapeutic impact with a more balanced ratio of THC and CBD, rather than either one on its own. The optimum amounts of THC and CBD should provide the most relief.

To effectively achieve a patient's titration point begin by dosing in the evening, and separate successive doses by at least six hours. Maintain a consistent dosing schedule and gradually increase the quantity (if needed) to find the optimal dose. Adjust dose timing based on the severity of symptoms. Some patients prefer to take lower doses at more frequent intervals.

For medical vaping start with 1 inhalation, and then allow a gap of 15 minutes to several hours. Proceed with 1 inhalation every 15-30 minutes until a therapeutic response is achieved or adverse effects experienced.

SIDE EFFECTS

Prescribers and patients should be aware of the short-term side effects of cannabis. A higher THC content may produce short-term effects such as drowsiness, dry mouth, disorientation, euphoria and confusion. These problems may be counteracted by CBD.

Patients on higher THC products, especially, should be warned not to drive or operate heavy machinery whilst under the influence of such side effects. Cannabis should not be used in the case of pregnancy or while breastfeeding.

There has been no reported death from cannabis overdose. High dose THC in overdose can cause extreme anxiety, increased pulse, paranoia, and psychosis rarely, amongst other symptoms. THC in overdose in a cardiac patient with unstable angina may result in a cardiovascular event, which may be high risk.

PRODUCT COST

Products currently cost between R70 to R200 per day, depending on many factors, including: the ratio of THC and CBD in the prescribed product; the amount individually used; the product format (i.e. Sprays, capsules, vapes and oils). The cost could also vary depending on the pharmacy or doctor dispensing fee. Products and prices can be discussed with the prescribing doctor.

DISCLAIMER

This guide is for information purposes and does not provide definitive advice on dosage for particular products. Some general points may be useful. No representations as to the content are contained herein. Owing to limited evidence on dosage and the interval for inhaled vaporized cannabis and cannabis oils, there are no validated dosage recommendations for medical cannabis. As such, the information in this document is based upon best available published evidence.

SOURCES

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