

Practical considerations in medical cannabis administration and dosing

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- Concise data on cannabis pharmacology related to tetrahydrocannabinol (THC), cannabidiol (CBD) et al., methods of administration (smoking, vaporization, oral), and dosing recommendations
- General approach to cannabis initiation is ‘start low, go slow, and stay low’.

Dosing:

Ideally, patients should start THC-dominant preparations at bedtime to limit adverse events and encourage development of tolerance. A following regimen is suggested:

Step	Oil	Vaporization
Step 1	Start with 5 mg CBD oil twice a day	Start with one inhalation
Step 2	Titrate dose by 5 mg CBD every 2-3 days (if no adverse events or until patient reaches goals of therapy).	Wait 15-30 minutes
Step 3	If CBD alone is not reaching treatment goals (usually at doses of ≥ 40 mg CBD), clinicians can consider adding THC after assessment of benefit vs risk Recommended starting dose is 1- 2.5 mg THC at bedtime. Titrate by 1-2.5mg THC every 2-7 days If daytime THC is needed, starting dose is 1 mg THC. Titrate by 1-2.5mg THC every 2-7 days.	Increase by 1 inhalation every 15-30 minutes until patient reached goals of therapy (providing no adverse events)
Step 4	Doses above 40 mg/day of THC are rarely required. If reached, clinicians should re-assess risk-benefit ratio for patient	Final dose = total consecutive inhalation doses within a dosing session required to reach goals of therapy

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Route of administration

Variations in cannabis formulation and administration method influences the dosing, titration, and monitoring protocol. Each route of administration (e.g. smoking, oral, topical) has unique properties leading to differing onsets of action, duration, and effects (Table 1, 2). The appropriate administration technique should be matched to the type of symptoms being controlled (acute vs chronic) and if there are individual patient safety risks. The main considerations are as follows:

- Acute symptoms = vaporization
- Chronic symptoms = oral or oromucosal
- Avoiding smoking is always recommended

Table 1
Cannabis routes of administration.

Cannabis routes of administration			
Smoking	Vaporisation	Oral	Other routes
<ul style="list-style-type: none"> • Most common route of administration, but not recommended (joints, bongs, pipes, etc.) • Combustion at 600–900 °C producing toxic biproducts: tar, PAH (polycyclic aromatic hydrocarbons), carbon monoxide (CO), ammonia (NH₃). • Chronic use associated with respiratory symptoms (bronchitis, cough, phlegm), but not lung cancer nor COPD (if cannabis only). • Patients may mix with tobacco increasing respiratory/cancer risk • 30–50% of cannabis is lost to 'side-stream' smoke 	<ul style="list-style-type: none"> • Heats cannabis at 160–230 °C. Reduced CO, but not complete elimination of PAH demonstrated to date. • Vaporisation produces significantly less harmful biproducts vs. smoking. • Decreased pulmonary symptoms reported compared to smoking. 	<ul style="list-style-type: none"> • Oils, capsules and other po routes increasingly popular due to convenience and accuracy of dosing. • Edibles (brownies/cookies) may be more difficult to dose. • Juicing and cannabis teas do not allow for adequate decarboxylation of raw plant • Nabiximols oromucosal spray is currently the only cannabis-based prescription that delivers standardised dosage of CBD/THC in a 1:1 ratio with extensive research • Tinctures and lozenges intermediate onset with limited research 	<ul style="list-style-type: none"> • Topicals ideal for localised symptoms (dermatological conditions, arthritis), with limited research evidence • Suppositories possibly indicated for specific populations (cancer, GI symptoms, young/elderly, etc.) with variable absorption. THC-hemisuccinate may allow for best absorption with limited research. • Recreational routes include 'shatter', 'dabs', concentrates. Deliver very high doses of THC with high risk of euphoria, impairment, reinforcement, toxic psychosis, orthostatic hypotension. Inappropriate for medical application.

Table 2
Administration factors in cannabis delivery methods.

Issue	Smoking/vaporisation	Oral	Oromucosal	Topical
Onset (min)	5–10	60–180	15–45	Variable
Duration (h)	2–4	6–8	6–8	Variable
Pro	Rapid action, advantage for acute or episodic symptoms (nausea/pain)	Less odor, convenient and discrete, advantage for chronic disease/symptoms	Pharmaceutical form (nabiximols) available, with documented efficacy and safety.	Less systemic effect, good for localised symptoms
Con	Dexterity required, vaporisers may be expensive, and not all are portable	Titration challenges due to delayed onset	Expensive, spotty availability	Only local effects

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Adverse Effects

Some individuals can experience adverse effects after consuming cannabinoids such as CBD and THC. These adverse effects, which range from very common to rare, can be

- THC related
- THC and CBD related
- Specific to Route of Administration

Table 4
Adverse events associated with cannabis-based medicines.

Side effect	Most common	Common	Rare
Drowsiness/fatigue	✓		
Dizziness	✓		
Dry mouth	✓		
Cough, phlegm, bronchitis (Smoking only)	✓		
Anxiety	✓		
Nausea	✓		
Cognitive effects	✓		
Euphoria		✓	
Blurred vision		✓	
Headache		✓	
Orthostatic hypotension			✓
Toxic psychosis/paranoia			✓
Depression			✓
Ataxia/dyscoordination			✓
Tachycardia (after titration)			✓
Cannabis hyperemesis			✓
Diarrhea			✓

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