

A close-up photograph of cannabis buds, showing the green leaves and the white, crystalline trichomes that cover the plant. The lighting is soft, highlighting the texture of the trichomes and the serrated edges of the leaves.

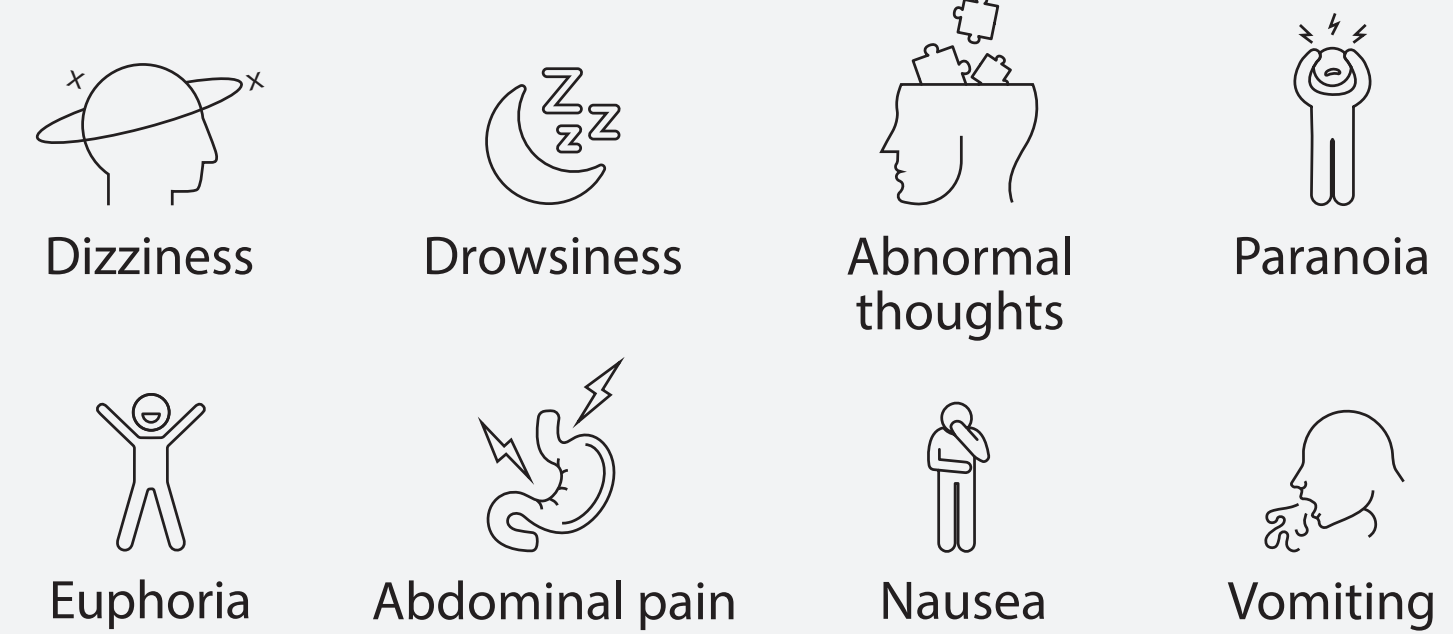
Some Things to Know When Using a Cannabis or Hemp Product



FDA approval requires assessment of benefits and risks of a product. FDA also inspects manufacturing.

Based on the 4 FDA-approved CBD or THC drugs, CBD and THC may have the following side effects and drug-drug interactions in the conditions studied.

	THC
POTENTIAL SIDE EFFECT(S)*	



THC
POSSIBLE DRUG-DRUG INTERACTION(S)*
<p>Alcohol</p> <p>Alcohol consumption may increase the effects of THC, leading to increased drowsiness, impaired coordination, and slowed reaction times. It is advised to avoid alcohol while using THC.</p> <p>Anticoagulants</p> <p>THC may interact with anticoagulant medications, such as warfarin, increasing the risk of bleeding. Patients taking anticoagulants should monitor for signs of bleeding and consult their healthcare provider.</p> <p>Antidepressants</p> <p>THC may interact with certain antidepressant medications, such as selective serotonin reuptake inhibitors (SSRIs), potentially leading to increased drowsiness or serotonin syndrome. Patients should be monitored for these symptoms.</p> <p>Antipsychotics</p> <p>THC may interact with antipsychotic medications, potentially leading to increased sedation or changes in blood pressure. Patients should be monitored for these effects.</p> <p>Cardiovascular Medications</p> <p>THC may interact with certain cardiovascular medications, such as beta-blockers, potentially leading to changes in heart rate or blood pressure. Patients should be monitored for these effects.</p> <p>Chemotherapy</p> <p>THC may interact with certain chemotherapy medications, potentially leading to increased nausea or vomiting. Patients should be monitored for these symptoms.</p> <p>Diabetes Medications</p> <p>THC may interact with certain diabetes medications, potentially leading to changes in blood sugar levels. Patients should monitor their blood sugar and consult their healthcare provider.</p> <p>Drugs Affecting Liver Enzymes</p> <p>THC may interact with drugs that affect liver enzymes, such as CYP2C9 and CYP3A4, potentially leading to changes in drug metabolism. Patients should be monitored for these effects.</p> <p>Epilepsy Medications</p> <p>THC may interact with certain epilepsy medications, potentially leading to changes in seizure activity. Patients should be monitored for these effects.</p> <p>Herbal Supplements</p> <p>THC may interact with certain herbal supplements, such as St. John's Wort, potentially leading to changes in drug metabolism. Patients should be monitored for these effects.</p> <p>Insulin</p> <p>THC may interact with insulin, potentially leading to changes in blood sugar levels. Patients should monitor their blood sugar and consult their healthcare provider.</p> <p>Muscle Relaxants</p> <p>THC may interact with muscle relaxant medications, potentially leading to increased drowsiness or impaired coordination. Patients should be monitored for these effects.</p> <p>Pain Medications</p> <p>THC may interact with certain pain medications, such as opioids, potentially leading to increased sedation or respiratory depression. Patients should be monitored for these effects.</p> <p>Respiratory Medications</p> <p>THC may interact with certain respiratory medications, such as bronchodilators, potentially leading to changes in breathing. Patients should be monitored for these effects.</p> <p>Sedatives</p> <p>THC may interact with sedative medications, potentially leading to increased drowsiness or impaired coordination. Patients should be monitored for these effects.</p> <p>Stimulants</p> <p>THC may interact with stimulant medications, potentially leading to changes in heart rate or blood pressure. Patients should be monitored for these effects.</p> <p>Surgery</p> <p>THC may interact with certain surgical procedures, potentially leading to changes in anesthesia requirements. Patients should inform their healthcare provider of their THC use.</p> <p>Transdermal Patches</p> <p>THC may interact with certain transdermal patches, potentially leading to changes in drug absorption. Patients should be monitored for these effects.</p> <p>Yeast Infections</p> <p>THC may interact with certain yeast infection medications, potentially leading to changes in drug metabolism. Patients should be monitored for these effects.</p>

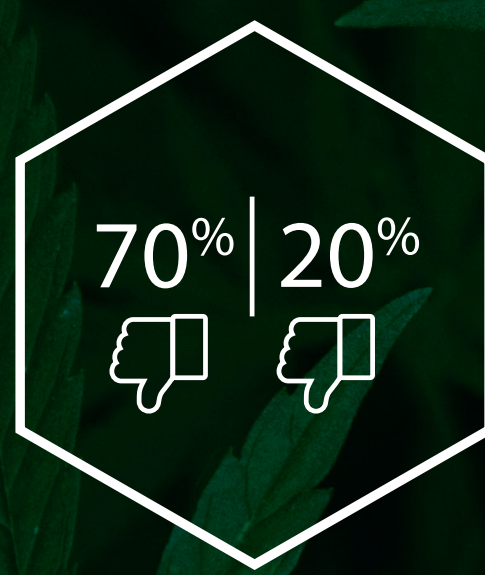
- > Antibiotics
- > Anti-seizure medicines
- > Antifungals
- > Antivirals
- > Pain medicines
- > Cancer medicines

**This is a general list of possible interactions with these types of medications; it is not a complete list of all potential side effects or drug interactions.*

DID YOU KNOW?

- The FDA has issued at least 48 warning letters to dispensary companies for incorrect labels and illegal advertising.[†]
- A study of non-FDA approved products showed nearly 70% were mislabeled for CBD and another 20% contained undisclosed THC.[‡]
- FDA-approved products containing CBD and THC have undergone rigorous testing.

† [https://www.fda.gov/oc/ohrt/cannabis-dispensary-warning-letters](#)
‡ [https://www.fda.gov/oc/ohrt/cannabis-dispensary-warning-letters](#)



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FDA-approved products containing CBD and THC have undergone rigorous testing.

If you have additional questions, Greenwich Biosciences Medical Information department may be reached by email medinfo@greenwichbiosciences.com or by calling 1-833-424-6724.

1. Syndros® [package insert]. Chandler, AZ: Insys Therapeutics, Inc.; 2018. **2.** Marinol® [package insert]. North Chicago, IL: AbbVie Inc.; 2017. **3.** Cesamet® [package insert]. Somerset, NJ: Media Pharmaceuticals Inc.; 2013. **4.** Epidiolex® [package insert]. Carlsbad, CA: Greenwich Biosciences, Inc.; 2018. **5.** United States Food and Drug Administration (FDA). FDA regulation of cannabis and cannabis-derived products: questions and answers. April 2, 2019. <https://www.fda.gov/news-events/public-health-focus/fda-regulation-cannabis-and-cannabis-derived-products-questions-and-answers#othercbdaapproved>. Accessed June 24, 2019. **6.** Cytochrome P450 Drug Interactions. Pharmacist Letter. May 2016. <https://pharmacist-therapeuticresearch.com/Content/Segment/PRL/2016/May/Cytochrome-P450-Drug-Interactions-9674>. Accessed June 24, 2019.

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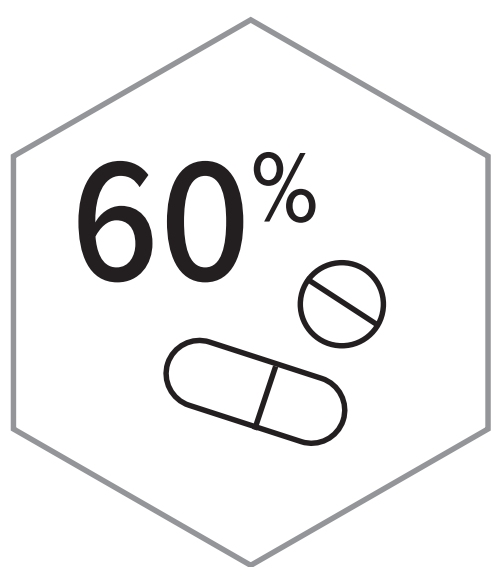
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Importance of Monitoring Drug Interactions Between Your Patients’ Medications and Cannabis Products



The **cytochrome P-450 (CYP) system** is one of the most important systems for drug metabolism



Approximately **60%** of all clinically prescribed drugs are metabolized via CYP3A4



Cannabinoid products are cleared by the CYP-450 system, including CYP3A4

Cannabinoid products can be inducers or inhibitors of the various CYP enzymes; therefore, healthcare providers should consider monitoring patient's use of cannabis products to reduce the risk of adverse events and to maintain the effectiveness of other concomitant medications.

Based on the 4 FDA-approved cannabinoid drugs, CBD and THC may have the following side effects and drug-drug interactions.

CANNABIDIOL (CBD)*

CBD is a substrate for CYP3A4 and CYP2C19. Therefore, drugs that inhibit or induce these 2 enzymes will affect the plasma concentration of CBD

CBD can function as an inhibitor, an inducer, or both

CBD	INHIBITION	INDUCTION
CYP1A2	+	+
CYP2B6	+	+
CYP2C8	+	
CYP2C9	+	
CYP2C19	++	
UGT1A9	+	
UGT2B7	+	

TETRAHYDROCANNABINOL (THC)*

THC is a substrate for CYP3A4 and CYP2C9. Therefore, drugs that inhibit or induce these 2 enzymes will affect the plasma concentration of THC

- ✓ THC is highly protein bound. May displace other drugs, increasing the risk of adverse events
- ✓ Added CNS effects (dizziness, sedation, confusion) when taken with CNS depressants
- ✓ Hypotension, hypertension, and tachycardia may occur when taken with drugs that also affect the cardiac system
- ✓ THC may lower seizure threshold. May affect anticonvulsants therapy

Potential drug interactions may occur with CBD and/or THC and the following medications:

> Proton pump inhibitors

> Antibiotics

> Antidepressants

> Anticonvulsants

> Antifungals

> Antivirals

> Induction/anesthesia

> Antihypertensives

> Antiarrhythmics

> Antipsychotics

> Benzodiazepines

> Chemotherapy

> Opioids

> Sympathomimetics

> Anticoagulants

> Antiplatelets

> Others

Monitoring for safety and effectiveness is recommended.

*Not a complete list of all drug-drug interactions.

Advise patients to talk to their healthcare providers about their current medications and OTC products they are taking at their next visit.

Pharmacists should talk to their patients at their next visit about possible drug interactions with concomitant cannabinoid therapy.

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References: **1.** Le J. Drug Metabolism. *Merck Manuals Professional Edition*. <https://www.merckmanuals.com/professional/clinical-pharmacology/pharmacokinetics/drug-metabolism>. Accessed August 23, 2019. **2.** Iffland K, Grotenhermen F. An update on safety and side effects of cannabidiol: a review of clinical data and relevant animal studies. *Cannabis Cannabinoid Res*. 2017; 2(1):139-154. **3.** EPIDIOLEX® [package insert]. Carlsbad, CA: Greenwich Biosciences, Inc.; 2018. **4.** Marinol® [package insert]. North Chicago, IL: AbbVie Inc.; 2017. **5.** Syndros® [package insert]. Chandler, AZ: Insys Therapeutics, Inc.; 2018. **6.** Cesamet® [package insert]. Somerset, NJ: Media Pharmaceuticals Inc.; 2013.

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