A Provider’s Guide to Medical Cannabis: THC and CBD
Putting the Evidence to Work for Improved Patient Care

What is Medical Cannabis?
• Cannabis is a genus of flowering plants. It produces a resin containing several different cannabinoids
• Delta-9-tetrahydrocannabinol (or THC) is the main active cannabinoid in Cannabis
• Cannabidiol (CBD) is the main active cannabinoid in Hemp. Hemp is Cannabis with <0.3% THC concentration
• THC is responsible for the mood altering effects of cannabis
• THC is used by patients with pain, anxiety, insomnia, chemotherapy induced nausea, muscle spasticity, and reduced appetite
• CBD is used by patients with seizures, pain, inflammation, anxiety, insomnia, nausea, and IBD

Clinical Evidence: Why would you recommend medical cannabis for your patients?
In 2017, an ad hoc committee of the National Academies of Science, Engineering, and Medicine published the report *The Health Effects of Cannabis and Cannabinoids: The Current State of Evidence and Recommendations for Research*. In the report, the committee presented nearly 100 conclusions related to the health effects of medical cannabis. Some of their conclusions include:

There is **conclusive or substantial evidence** that cannabis or cannabinoids are effective:
• For the treatment for **chronic pain** in adults (cannabis)
• Antiemetics in the treatment of **chemotherapy-induced nausea and vomiting** (oral cannabinoids)
• For improving patient-reported **multiple sclerosis spasticity symptoms** (oral cannabinoids)

There is **moderate evidence** that cannabis or cannabinoids are effective for:
• Improving short-term sleep outcomes in individuals with **sleep disturbance** associated with obstructive sleep apnea syndrome, fibromyalgia, chronic pain, and multiple sclerosis (cannabinoids, primarily nabiximols)

There is **limited evidence** that cannabis or cannabinoids are effective for:
• **Increasing appetite** and **decreasing weight loss** associated with HIV/AIDS (cannabis and oral cannabinoids)
• Improving clinician-measured multiple sclerosis spasticity symptoms (oral cannabinoids)
• Improving symptoms of **Tourette syndrome** (THC capsules)
• Improving **anxiety** symptoms, as assessed by a public speaking test, in individuals with **social anxiety disorders** (cannabidiol)
• Improving symptoms of **posttraumatic stress disorder** (nabilone; one single, small fair-quality trial)

**Chronic Pain**
• Evidence shows there is synergistic analgesia with greater-than-additive effects between cannabinoids and opioids\(^1\)
• There is no enhancement of cardiopulmonary suppression with combination treatment\(^{1,2}\)
• The treatment of chronic pain in this open-label, prospective cohort resulted in improved pain and functional outcomes, and a significant reduction in opioid use\(^9\)
• Use of marijuana for chronic pain, neuropathic pain, and spasticity due to multiple sclerosis is supported by high-quality evidence\(^4\)

**Anxiety**
• Existing preclinical evidence strongly supports CBD as a potential treatment for generalized anxiety disorder, panic disorder, social anxiety disorder, obsessive–compulsive disorder, and post-traumatic stress disorder when administered acutely\(^6\)
• When co-administered with THC, CBD was able to attenuate the anxiogenic effect of high doses of THC. CBD was able to reduce post-stress anxiety in healthy subjects submitted to simulated public speaking\(^7\)
• Cannabis consumption affects anxiety-related behaviors in a dose-dependent manner\(^6,7\)

**Sleep Disturbance**
• In patients with unremitted PTSD, treatment with orally absorbable THC had beneficial effects on global symptom severity, sleep quality, frequency of nightmares, and PTSD hyperarousal symptoms\(^7\)
• CBD may hold promise for REM sleep behavior disorder and excessive daytime sleepiness, while nabilone may reduce nightmares associated with PTSD and may improve sleep among patients with chronic pain\(^8\)
THC

THC is a CYP450 inhibitor - 2C9 and 3A4.
FDA approved synthetic THC*
- Dronabinol — oral chemotherapy induced nausea/vomiting and weight loss in patients with HIV
- Nabilone — oral chemotherapy induced nausea/vomiting

Adverse Effects
THC: orthostatic hypotension, tachycardia, decreased intraocular pressure, nystagmus, conjunctival injection, lethargy, decreased concentration, psychomotor impairment, euphoria, acute panic or paranoid reaction, altered motivation, increased appetite, tolerance

Cannabinoids

Pharmacology
- Cannabinoids binds to CB1 receptors in the CNS and CB2 receptors, mostly expressed in cells of the immune system, with varying affinity.
- THC is a stronger agonist than CBD.
- Clinically significant drug-drug interactions due to CYP450 inhibition by medical cannabis have not been reported.
- *Synthetic cannabinoids are associated with more morbidity and mortality than phytocannabinoids (naturally occurring cannabinoids)

Relative Contraindications to Medical Cannabis
- Pregnant or breast feeding mothers — possible link between smoking cannabis during pregnancy and low birth weight
- Adolescents — heavy users show disadvantages attention, learning, and processing speed. Resolves within 3 months of abstinence
- Children — possibility for severe disorientation, confusion, and anxiety. Long term studies have not been done
- Cannabis Hyperemesis Syndrome

Routes of Administration
- Smoking — fastest onset < 5 mins, duration 2-3 hours
- Vaping — onset < 5 mins, duration 2-3 hours
- Concentrates — wax, shatter, distillate. Most potent products with the highest levels of cannabinoids. Used in smoking or vaping or creation of infused products
- Edibles/Capsules — longest onset 60-90 minutes, duration 6-8 hours
- Tinctures — most accurate dosing method, onset 15-30 minutes sublingually or 60-90 minutes when ingested, duration 4-6 hours
- Transdermal Patches/Gel Pens — quick onset, long duration of effect
- Creams/Ointments — regional pain relief, onset 30 minutes, duration 2-4 hours

Dosing Recommendations: THC/CBD combo*
For the cannabinoid naïve patients, START LOW and suggest 1:1 products of THC:CBD

THC

Chronic Pain: 2mg—10mg
Sleep Disturbance: 2mg—5mg
Anxiety: 2mg—25mg
MS Spasticity: 2mg—5mg
Anti-emetic: 2mg—25mg

CBD

CBD is a CYP450 inhibitor — 2C19 and 3A4
CBD is a weak partial agonist and can antagonize the effect of THC at CB receptors

FDA approved synthetic CBD*
- Epidiolex — oral. Seizures associated with Lennox-Gastaut Syndrome or Dravet Syndrome in patients 2 years of age or older

Adverse Effects
CBD: fatigue, diarrhea, weight change

Ensuring Your CBD is Good Quality
- Choose CBD products made with American grown hemp (VT, CO, OR, WA, KY, TN)
- Choose “full spectrum” CBD-rich hemp extracts
- Look for labels that indicate the amount of THC/CBD per serving, not whole bottle
- Beware of companies that make explicit health claims — this is illegal
- Seek out CBD-rich products derived from high-resin cannabis grown sustainably
- Avoid vape cartridge products with thinning agents — propylene glycol and ethylene glycol
- Beware companies claiming to source CBD from seed or stalk

Dosing Recommendations: CBD

Chronic Pain: 10mg—25mg
Sleep Disturbance: 10mg—40mg
Anxiety: 10—25mg
MS Spasticity: 20mg—50mg
IBD: 200-300mg BID
Resources for Providers:
- Vermont Cannabinoid Clinic: Medical Guidance for Medicinal Cannabis
  Paul Jerard, PA—C  pbj@vtcclinic.com
- Ada Puches, Community Outreach Coordinator
  Champlain Valley Dispensary and Southern Vermont Wellness
  ada@cvdvt.org
- Vermont Marijuana Registry— http://medicalmarijuana.vermont.gov
- Project CBD— projectCBD.org
  California-based nonprofit dedicated to promoting and publicizing research into the medical uses of cannabidiol (CBD)
- The University of Vermont’s Free Cannabis Speakers Series—
  learn.uvm.edu/com/program/cannabis-speaker-series-from-botany-to-medicine/
- The Society of Cannabis Clinicians—cannabisclinicians.org
- United Patient’s Group—unitedpatientsgroup.com
- Healer.com

References: