



Cannabidiol and Use in Chronic Pain

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Today's Presenters



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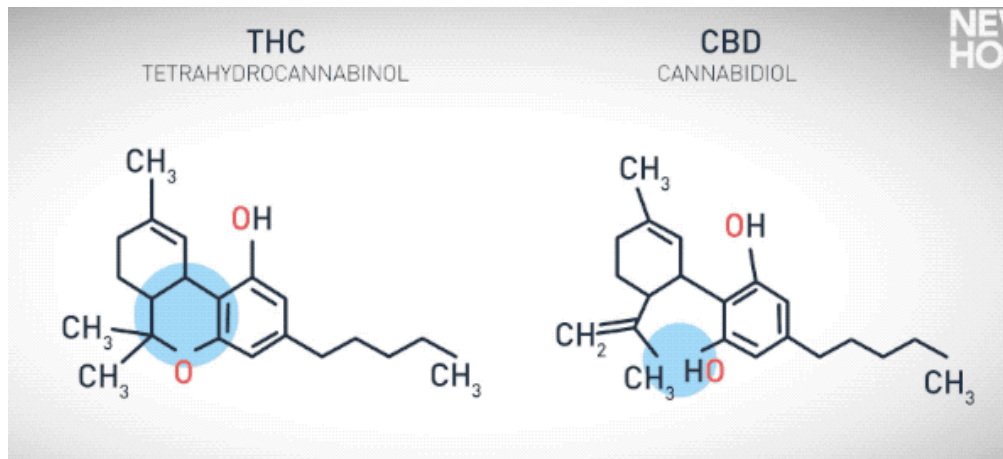
Recent Rise in Popularity of CBD Oils

Significance of 2018 Farm Bill

- Differentiated hemp from marijuana
- Hemp is the cannabis plant with one key difference: it must contain less than 0.3 percent of THC
- Allows hemp cultivation (only with a license) and interstate commerce
- Individual state laws may place more restrictions
- Removes hemp-derived products from Schedule I status
- Did NOT make all CBD products legal

What is cannabidiol (CBD)?

- Component of cannabis that lacks a psychoactive component
- Plant is physically indistinguishable



CBD versus THC

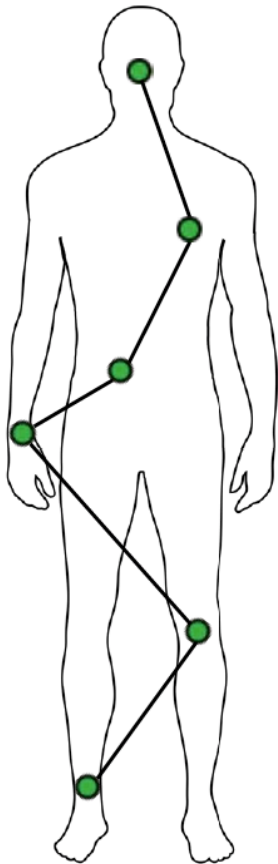
CBD

- **Not psychoactive:**
Will not produce the characteristic “high” observed with THC
- Highly regulated but *may be legal* based on adherence to federal and state laws and sourcing from a licensed grower
- **Therapeutic potential:**
Anti-inflammatory, pain relieving, immunomodulating, anti-anxiety, etc.
- **Risks:** Minimal; Drug interactions, hepatic toxicity
- **Receptors:** Low affinity for CB1 & CB2 receptors – “potent antagonist” (Thomas et al., 2007)

THC

- The compound that elicits the “high” in marijuana
- Highly regulated; Schedule I controlled substance
- **Therapeutic potential:** Anti-nociceptive>anti-inflammatory, anti-proliferative, etc.
- **Risks:** Can induce anxiety and psychosis, drug interactions, hepatic toxicity
- **Receptors:** Binds to both CB1 & CB2 receptors – partial agonist

The Endocannabinoid System



THE ENDOCANNABINOID SYSTEM (ECS)

We are “hardwired” with a master control system called the Endocannabinoid System (ECS). The ECS is made up of cell receptors that act as messengers, giving your body specific directions on what to do.

Some of these messengers are located in the brain and the spinal cord. Others are located in immune cells, gastrointestinal tract and everything outside the brain and spinal cord.

THE ECS HELPS IN REGULATING:

ANXIETY
APPETITE/HUNGER
DEPRESSION
DIGESTION
IMMUNE FUNCTION
MEMORY
MOOD

MOTOR CONTROL
PAIN
PLEASURE & REWARD
REPRODUCTION & FERTILITY
SLEEP
TEMPERATURE REGULATION

What is driving the evidence (or lack thereof)?

- Very few studies of CBD alone exist (most studies are with a mixture of CBD and THC)
- Most studies done outside the United States
- Cannabis-based research conducted in U.S. must use research-grade cannabis from the one sole provider of the product at the Univ. of Mississippi
- Difficulties finding reliable, standardized preparations
- Poor oral bioavailability with variable absorption
- CBD is an oily substance – challenging to produce palatable dosage forms

Study of CBD Monotherapy

- Small open-label crossover study in patients with chronic, refractory pain
- Compared 1:1 mixture of CBD:THC with placebo, CBD monotherapy, and THC monotherapy
- Effects reported via twice daily patient journals of pain using visual analog scale (VAS)
- Only THC and THC:CBD were significantly more effective than placebo for pain symptoms
- Nine out of 24 patients had a 50%+ decrease in VAS for pain symptoms (3 of the 9 received CBD alone)

Study of CBD Monotherapy

- Reported side effects
 - Dry mouth was the most commonly reported side effect across all products studied
 - Drowsiness was less commonly reported but still present in nearly 1/3 of patients
 - Dysphoria and euphoria were associated with the THC-containing products
- At the conclusion of the study, no patients who achieved pain relief selected CBD monotherapy as their “preferred” agent

[Anaesthesia](#). 2004 May;59(5):440-52.

Safety and Tolerability of CBD

- Precaution should be taken in the following populations:
 - Parkinson's Disease
 - Elevated LFTs
 - Females of child-bearing age without contraception
- Drug-drug interactions

Dosage Forms

- CBD Oil – different concentrations* (Full Spectrum and Broad Spectrum)
- CBD Capsules (Full Spectrum and Broad Spectrum)
- CBD Topical: Salve, Roll on, Lotion

**Very important to find the right dose for each patient*

** Use caution when buying dosage forms such as gummies, teas, etc.*

Examples of CBD Topical Preparations



Full Spectrum Salve



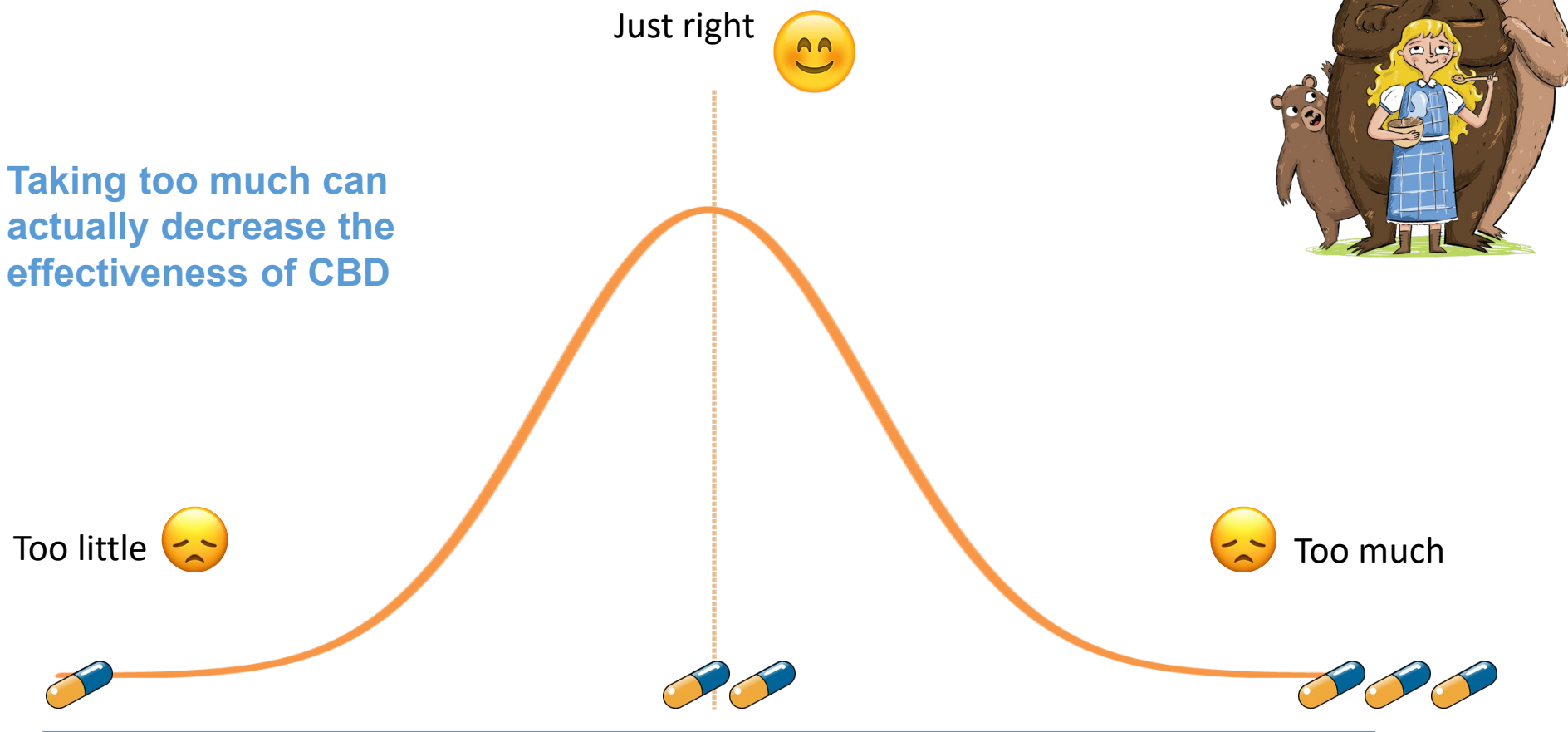
Full Spectrum Relief Roll- on



Pain Relief Lotion

Finding the Right Dose – a “Goldilocks” Phenomenon

Taking too much can actually decrease the effectiveness of CBD



Potential Side Effects

- Most people do not experience many side effects from taking CBD
- Dry mouth, upset stomach, drowsiness, fatigue or weight loss could occur while taking CBD
- These are especially likely when taking more than recommended

CBD Oil and Urine Drug Testing

- **If small amounts of THC are present in a CBD product, it could show up on a standard drug screening**
- Full Spectrum Products COULD show up positive
- Most urine drug screens test for THC or its metabolites
- CBD products often do not contain enough THC to lead to positive drug screen
 - High doses could lead to a positive urine drug screen
 - Test can be positive for 1 week to 10 days after use or up to 6 weeks with heavy use.

Common Drug Interactions

If the patient is taking medications for any of the following conditions, it is important to assess for potential drug-drug interactions:


- Anxiety or Depression
- Seizures
- Heart disease
- Heartburn

Use Caution When Selecting a CBD Product

FDA: 91% of products do not match packaging (2016)



JAMA: 70% of CBD products do not match label
(Bon Miller et al., 2017)



Solution? Ask for a Certificate of Analysis (COA)

Selecting a CBD Product

- ✓ Section 7606 Compliant with Licenses from a State University or Agriculture Department
- ✓ Less than 0.3% THC
- ✓ Free of pesticides, solvents, and other potential impurities
- ✓ Lot-specific, third party certificate of analysis
- ✓ cGMP compliant

A Proper Certificate of Analysis for CBD Products

- ✓ Be completed by a third-party lab
- ✓ Include cannabinoid content
- ✓ Include tests for pesticides, microbes, chemicals
- ✓ Be lot specific

Cannabinoid Test Results			02/21/2018
Cannabinoid analysis utilizing High Performance Liquid Chromatography (HPLC, QSP 5-4-4-4)			
	LOD mg/mL	LOQ mg/mL	mg/mL
THC	0.000034	0.001	1.72
THCa	0.000066	0.001	ND
CBD	0.000057	0.001	7.73
CBDa	0.000038	0.001	0.08
CBN	0.000029	0.001	0.18
CBDV	0.000065	0.001	0.27
CBDVa	0.00003	0.001	ND
CBG	0.000086	0.001	0.23
CBGa	0.000072	0.001	ND
THCV	0.000035	0.001	0.11
Δ8 - THC	0.000083	0.001	0.01
CBC	0.000095	0.001	0.32
Total THC			1.72 mg/ml
Total CBD			7.80 mg/ml
Total Active Cannabinoids:			10.65 mg/ml

References and Resources

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