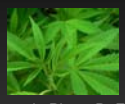
Update on Cannabis for Medical Professionals



Laura Borgelt, PharmD, FCCP, BCPS
Professor and Associate Dean
University of Colorado Skaggs School of Pharmacy
May 10, 2018

Skaggs School of Pharmacy and Pharmaceutical Sciences
100+ years of education, patient care & scientific discovery.

Disclosures

Dr. Borgelt has no relevant financial disclosures.
Dr. Borgelt will be discussing unapproved drugs and uses.
Dr. Borgelt receives grant funding from Colorado Department of Public Health and Environment (CDPHE) for a study evaluating cannabis for epilepsy
Dr. Borgelt has served as a member of seven working groups:

- Amendment 64 (Marijuana Legalization) Task Force Working Group: Consumer Safety and Social Issues
- State Licensing Authority Labeling, Packaging, Product Safety and Marketing
- State Licensing Authority Medical and Retail Marijuana Mandatory Testing and Random Sampling
- State Licensing Authority Serving Size and Product Potency
- CDPHE Retail Marijuana Public Health Advisory Committee
- CDPHE Pregnancy and Breastfeeding Guidelines Committee
- Legislation Implementation for HB17-1367: Authorize Marijuana Clinical Research

The Story…

Objectives

- Identify the current status of cannabis in the United States.
- Describe the clinical pharmacology of cannabis and its active components.
- Evaluate and discuss clinical studies performed in patients with various conditions to determine the effectiveness and adverse effects of medical cannabis.
- Identify potential drug interactions and other patient safety issues that may occur with the use of medical cannabis.
- Review important counseling strategies and hospital policies for patients considering medical cannabis use.

Poll Question

I know someone who consumes marijuana for medical or recreational purposes.

1. Yes, medical purposes only
2. No, recreational purposes only
3. Yes, both
4. No

Overall goal for this presentation is…

…to help you better understand the characteristics of marijuana and its effects so you can confidently talk with your patients about the potential benefits and risks of using marijuana.

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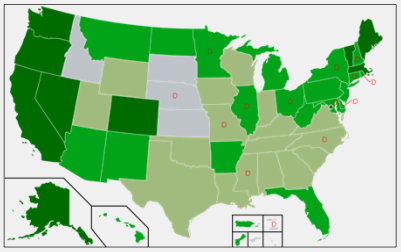
Cannabis

- Single molecule pharmaceuticals
  - Dronabinol (Schedule III)
  - Nabilone (Schedule II)
- Liquid extract: nabiximols (Sativex®)
  - Approved in 27 countries; U.S. - Phase III trials
- Liquid extract: cannabidiol (Epidiolex®)
  - FDA advisory panel unanimously recommended approval for Dravet and Lennox-Gastaut syndromes (April 2018)
- Phytocannabinoid-dense botanicals
  - *Cannabis sativa* – medicinal plant (Schedule I)

Legality of Cannabis in the United States



Legal
Legal for medical use
Legal for medical use, limited THC content
Prohibited for any use
D Decriminalized

https://upload.wikimedia.org/wikipedia/commons/6/6f/Map-of-US-state-cannabis-laws.svg

Prev Med. 2017;104:13-23. doi: 10.1016/j.ypmed.2017.07.008.

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Prev Med. 2017;104:13-23. doi: 10.1016/j.ypmed.2017.07.008.

Key Opinion

Considerations for medical use of marijuana are different than considerations for recreational use of marijuana.

Medical use: benefit – risk

Recreational use: risk - risk

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Patient Case in Colorado

- 47 yo male with PMH of hypertension, diabetes, peripheral neuropathy, and chronic pain
- Pain Treatment Regimen
  - Oxycontin 30mg po BID and oxycodone 5 mg po prn
  - His pain medications have not changed in over one year
  - Today, he admits that he has also been smoking medical marijuana twice daily for the past two years to help his pain (decreased from 8/10 to 4/10)
  - He has been afraid to tell the healthcare team because he believes they will not "approve" of this treatment. He states he saw a different physician to get his card and recommendation for cannabis

A Few Questions to Consider

- Are there other ways for him to consume MMJ to avoid the risks of smoking?
- Is MMJ effective for the treatment of pain?
- What adverse effects might this patient experience with chronic use of inhaled MMJ?
- Are there any drug interactions with MMJ?
- How might MMJ impact his opioid use?
- What other issues might this patient need to consider?
- How can I create an environment where patients feel safe to talk with me about any/all treatments they use?

Cannabis

- Plant-derived cannabinoids
  - Δ^9-tetrahydrocannabinol - THC
  - Δ^8-tetrahydrocannabinol - THC
  - Cannabidiol – CBD
  - Cannabinol - CBN
  - Cannabigerol - CBG
  - Cannabichromene - CBC
  - Cannabicyclol - CBL
  - Cannabielsoin - CBE
  - Cannbitriol - CBT
  - Miscellaneous
  - Cannabinodiol (air-oxidation)
- Terpenes
- Flavonoids
- And much more…

More than 104 different cannabinoids

Br J Pharmacology 2006;147:S163-71 Br J Pharmacology 2011;163:1344-64

POLL QUESTION

Which of the following receptors is a key target for THC?

1. Cannabinoid-1 receptor (CB1)
2. Cannabinoid-7 receptor (CB7)
3. Peroxisome Proliferator-Activated Receptor (PPAR)
4. G-protein receptor 55 (GPR55)

Endogenous Cannabinoid System

- Endocannabinoids and their receptors found throughout body: brain, organs, connective tissues, glands, and immune cells.
- In each tissue, the cannabinoid system performs different tasks; goal is always homeostasis
- When cannabinoid receptors are stimulated, variety of physiologic processes
  - **CB1 receptors**: nervous system, connective tissues, gonads, glands, organs
  - **CB2 receptors:** immune system and associated structures
- Endocannabinoids are substances our bodies make naturally to stimulate CB1 and CB2
  - **Anandamide**
  - **2-arachidonoylglycerol (2-AG)**

http://norml.org/library/item/introduction-to-the-endocannabinoid-system Accessed March 7, 2017
Neuro Endocrinol Lett. 2008 Apr;29(2):192-200.

Functional Effects of Anandamide at CB1 & CB2 Receptors

Structure	Anandamide regulates	Resultant effect
Spinal cord	Inhibit GLU & info transfer between body & brain	Decreased pain sensitivity
Parasympathetic system	Inhibit Ach release, HR regulation, urination regulation	HR stimulation, sometimes inhibits urination
Sympathetic system	Inhibit NE release, HR regulation, blood vessel constriction	Delayed reduction in HR and blood pressure
Neuronal cells	Inhibition GLU-induced excitotoxicity	Neuroprotective effect - prevent cell injury
Adipose tissue	Stimulates lipogenesis	Increased adiposity, insulin resistance
Reproductive tissue	Reduces testosterone, luteinizing hormone	Reduced fertility, altered menstrual cycle
Skin	Reduces histamine	Anti-pruritic effect
General	Role in relaxing, eating, sleeping, forgetting, protecting	Provide relief from stress, reduction of injury
General	Inhibits immune B lymphocytes, natural killer cells	Anti-inflammatory activity

Cell Death and Differentiation 2003;10, 946–55.

Cannabis Pharmacology

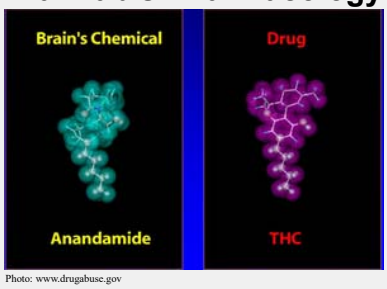


Photo: www.drugabuse.gov

Endocannabinoid System

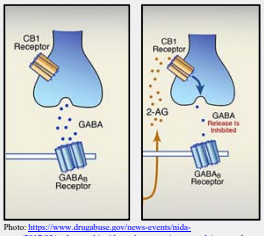
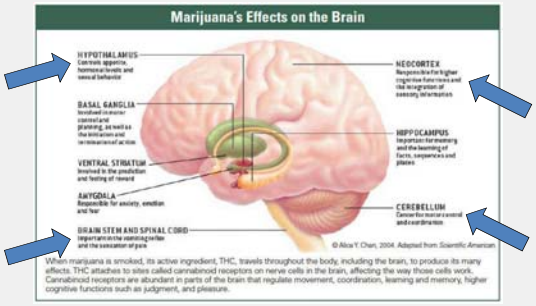


Photo: https://www.drugabuse.gov/news-events/nida-notes/2017/03/endocannabinoid-regulates-cocaine-reward (accessed 2018 April 11)

What happens when there is potential endocannabinoid deficiency, dysregulation, destabilization, or decreased binding?

Pertwee RG. Br J Pharmacology 2008;153:199-215.
Smith SC. Neuro Endocrinol Lett. 2014;35(3):198-201.

Marijuana's Effects on the Brain



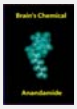
When marijuana is smoked, its active ingredient, THC, travels throughout the body, including the brain, to produce its many effects. THC attaches to sites called cannabinoid receptors on nerve cells in the brain, affecting the way those cells work. Cannabinoid receptors are abundant in parts of the brain that regulate movement, coordination, learning and memory, higher cognitive functions such as judgment, and pleasure.

National Institute on Drug Abuse. *How does marijuana produce its effects?* https://www.drugabuse.gov/public_printer/faq-how-does-marijuana-how-does-marijuana-produce-its-effects Accessed February 2, 2017.

Cannabidiol (CBD)

Little binding affinity to CB1/CB2

Suppresses enzyme fatty acid amide hydroxylase ("FAAH") – enzyme that breaks down anandamide



Opposes THC at CB1 receptor	Stimulates release of 2-AG	TRPV-1 receptor agonist	5-HT1A receptor activation	GPR55 antagonist

Epilepsia 2014;55(6):791–802. http://www.projectcbd.org/news/how-cbd-works/ Accessed 06/13/16. National Academies of Sciences, Engineering, and Medicine. 2017. *The health effects of cannabis and cannabinoids: The current state of evidence and recommendations for research*. Washington, DC: The National Academies Press. doi: 10.17226/24625.

Summary: Endocannabinoid System and THC

Photo: https://www.nimh.nih.gov/health/educational-resources/brain-basics/brain-basics.shtml

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Poll Question

Which of the following conditions has conclusive or substantial evidence that cannabis or cannabinoids are effective?

1. Increasing appetite and decreasing weight loss with HIV/AIDS
2. Improving intraocular pressure associated with glaucoma
3. Patient-reported multiple sclerosis spasticity symptoms
4. I have no idea

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National Academies: Health Effects of Cannabis

Conclusive or substantial evidence that cannabis or cannabinoids are **effective**:

- for treatment of chronic pain in adults (cannabis)
- for improving patient-reported multiple sclerosis (MS) spasticity symptoms, but limited evidence for clinician-measured spasticity (oral cannabinoids)
- As anti-emetics in the treatment of chemotherapy-induced nausea and vomiting (oral cannabinoids)

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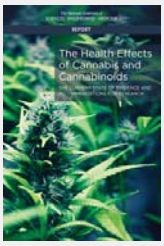
National Academies of Sciences, Engineering, and Medicine. 2017. *The health effects of cannabis and cannabinoids: The current state of evidence and recommendations for research*. Washington, DC: The National Academies Press. doi: 10.17226/24625.

National Academies: Health Effects of Cannabis



- **Moderate evidence** that cannabinoids, primarily nabiximols, are an **effective**:
  - to improve short-term sleep outcomes in patients with sleep disturbance associated with obstructive sleep apnea, fibromyalgia, chronic pain, and MS.

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National Academies of Sciences, Engineering, and Medicine. 2017. *The health effects of cannabis and cannabinoids: The current state of evidence and recommendations for research*. Washington, DC: The National Academies Press. doi: 10.17226/24625.

National Academies: Health Effects of Cannabis

- **Limited evidence that cannabis or oral cannabinoids are *effective* for…**
  - increasing appetite and decreasing weight loss associated with HIV/AIDS (cannabis and oral cannabinoids)
  - improving symptoms of Tourette syndrome (THC capsules)
  - Improving anxiety symptoms in individuals with social anxiety (cannabidiol)
  - improving symptoms of posttraumatic stress disorder (nabilone)
  - better outcomes (i.e., mortality, disability) after a traumatic brain injury or intracranial hemorrhage – statistical association
- **Limited evidence that cannabis or oral cannabinoids are *ineffective* for…**
  - improving symptoms of dementia (cannabinoids)
  - improving intraocular pressure associated with glaucoma (cannabinoids)
  - reducing depressive symptoms in individuals with chronic pain or MS (nabiximols, dronabinol, and nabilone)

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National Academies of Sciences, Engineering, and Medicine. 2017. *The health effects of cannabis and cannabinoids: The current state of evidence and recommendations for research*. Washington, DC: The National Academies Press. doi: 10.17226/24625.

National Academies: Health Effects of Cannabis

- No or insufficient evidence to support or refute that cannabinoids are effective for…
  - cancer-associated anorexia cachexia syndrome and anorexia nervosa
  - cancers, including glioma
  - irritable bowel syndrome
  - epilepsy
  - spasticity in patients with paralysis due to spinal cord injury
  - chorea and certain neuropsychiatric symptoms associated with Huntington's disease
  - symptoms associated with amyotrophic lateral sclerosis (ALS)
  - Parkinson's disease or levodopa-induced dyskinesia
  - dystonia
  - treatment for mental health outcomes in individuals with schizophrenia or schizophreniform psychosis
  - achieving abstinence in the use of addictive substances

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National Academies of Sciences, Engineering, and Medicine. 2017. *The health effects of cannabis and cannabinoids: The current state of evidence and recommendations for research*. Washington, DC: The National Academies Press. doi: 10.17226/24625.

Cannabinoids for Medical Use: Systematic Review and Meta-Analysis

CONDITION	# TRIALS*	Result vs. placebo % efficacy	Conclusion
Nausea/vomiting due to chemotherapy	3	Complete response OR 3.82 (95% CI 1.55-9.42) 47% vs 20%	Low-quality evidence suggesting improvements
Chronic pain	8	Reduction of 30% or more in pain OR 1.41 (95% CI 0.99-2.00) 37% vs 31%	Moderate-quality evidence to support use
Spasticity related to MS or paraplegia	8	Ashworth spasticity scale WMD** -0.12 (95% CI -0.24 to 0.01)	Moderate-quality evidence to support use

*Variety of cannabinoid products evaluated
**WMD: weighted mean difference
**Common AEs of cannabinoids included dizziness, dry mouth, nausea, fatigue, somnolence, euphoria, vomiting, disorientation, drowsiness, confusion, loss of balance, and hallucination.

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JAMA. 2015;313(24):2456-2473. doi:10.1001/jama.2015.6358

Cannabis for Chronic Pain: Systematic Review

CONDITION	# TRIALS	RESULT VS. PLACEBO	CONCLUSION
Neuropathic pain (Reduction of ≥30% pain)	13 (9 for results)	Risk Ratio 1.43 [95% CI, 1.16 to 1.88] p=0.111	Low-strength evidence cannabis may alleviate neuropathic pain
Multiple Sclerosis	9	No consistent effects	Insufficient evidence
Cancer	2	No consistent effects	Insufficient evidence
Other/mixed	5	Small improvements	Insufficient evidence

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Ann intern Med. 2017;167(5):319-331. doi: 10.7326/M17-0155

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Inhaled Cannabis for Neuropathic Pain: Meta-Analysis of Individual Data

- Synthesizes the individual participants' original data obtained from the studies' principal investigators
- Five randomized controlled trials evaluating inhaled cannabis
- Compared proportion of patients experiencing >30% clinical improvement in chronic neuropathic pain assessed with a continuous patient-reported instrument (e.g., visual analog scale) at baseline and after inhaled cannabis

RESULTS

- 178 patients with 405 observed responses
- Estimated OR (CRI) for >30% ↓ in pain score: 3.22 (1.59-7.24)
- Number needed to treat (CRI): 5.55 (3.35-13.7)

Note: gabapentin NNT 5.9 (4.6-8.3) for diabetic neuropathy

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J Pain 2015;16:1221-32. Cochrane Database of Systematic Reviews 2014, Issue 4. Art. No.: CD007938.

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Adverse Effects

- Serious Adverse Effects (SAEs)
  - Placebo: 1 (psychosis)
  - Cannabis: 2 (hypertension, increased pain)
- Mild adverse effects
  - Anxiety, disorientation, difficulty concentrating, headache, dry eyes, burning sensation, dizziness, and numbness
  - Psychoactive effects (such as feeling "high") were statistically significantly associated with treatment allocation in 2 studies and increased in frequency with increasing dose

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J Pain. 2015 Dec;16(12):1221-32. doi: 10.1016/j.jpain.2015.07.009. Epub 2015 Sep 9.

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Limitations and Conclusions

- Ineffective participant blinding
- Placebo effects likely
- Different causes of neuropathy
- Small number of studies and participants
- Difficult to estimate bioavailable cannabis
- Short-term data only (up to two weeks)

Inhaled cannabis results in short-term reductions in chronic neuropathic pain for 1 in every 5 to 6 patients treated.

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J Pain. 2015 Dec;16(12):1221-32. doi: 10.1016/j.jpain.2015.07.009. Epub 2015 Sep 9.

Pediatric Epilepsy

- Open-label trial of oral cannabidiol
- 214 patients 1-30 years with severe, intractable, childhood-onset, treatment-resistant epilepsy
- Oral cannabidiol 2-5 mg/kg per day, up-titrated until intolerance or to maximum dose of 25-50 mg/kg per day
- Objectives:
  - Establish the **safety and tolerability** of cannabidiol
    - 162 patients with 12 weeks of treatment included in analyses
  - Establish **efficacy** as median percentage change in the mean monthly frequency of motor seizures at 12 weeks
    - 137 patients with 12 weeks of treatment included in analyses

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Devinsky O et al. *Lancet Neurol.* 2016;15(3):270-8.

Results: Safety and Tolerability

- Adverse events reported in 128 (79%) of 162 patients
  - Somnolence (25%)
  - Decreased appetite (19%)
  - Diarrhea (19%)
  - Fatigue (13%)
  - Convulsion (11%)
- Five (3%) patients discontinued treatment
- Serious adverse events were reported in 48 (30%) patients
  - 20 (12%) patients had severe adverse events possibly related to cannabidiol use; the most common was status epilepticus (n=9 [6%]).

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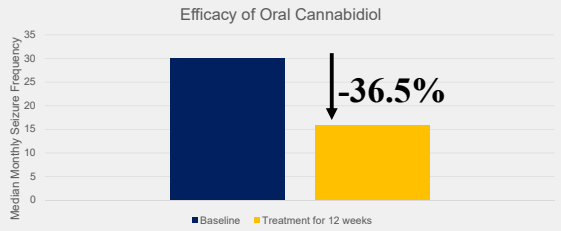
Devinsky O et al. *Lancet Neurol.* 2016;15(3):270-8.

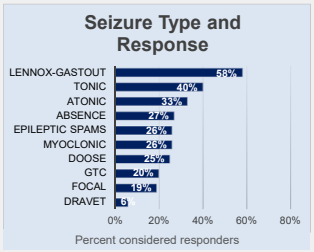
Results: Efficacy



Lancet Neurol. 2016;15(3):270-8. doi: 10.1016/S1474-4422(15)00379-8.

Pediatric Epilepsy

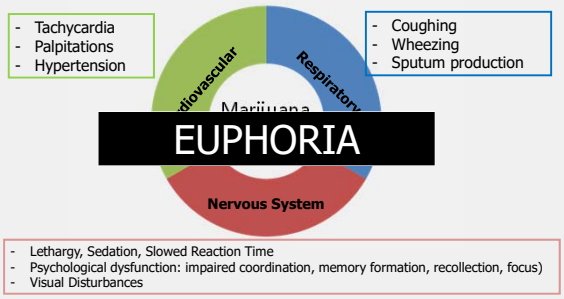
- Retrospective chart review
- 119 patients age 30 days-18 years
- 41% relocated to Colorado
- Parents of 58 patients (49%) reported at least some improvement in seizures.
- 24% considered to be responders to oral cannabis extract treatment, which was defined as a > 50% reduction in seizure burden
- 71% discontinued product



POLL QUESTION

Which of the following is/are common adverse effects of marijuana?

1. Headache
2. Slowed reaction time
3. Decreased heart rate
4. Insomnia
5. All of the above



Am J Health-Syst Pharm. 2007; 64:1037-1044, Pharmacotherapy 2013;33:195-209.
http://www.drugabuse.gov/publications/drugfacts/marijuana Drug Facts: Marijuana Accessed 12/23/15

Adverse Effects

Effects of short-term use	Effects of long-term use
▪ Impaired short-term memory ▪ Impaired motor coordination ▪ Altered judgment ▪ Motor vehicle accidents (2x) ▪ Paranoia and psychosis (high doses)	▪ Addiction (9% overall) ▪ Altered brain development* ▪ Cognitive impairment (with lower IQ)* ▪ Diminished life satisfaction and achievement* ▪ Poor educational outcome ▪ Symptoms of chronic bronchitis ▪ Increased risk of chronic psychosis disorders *Effect is strongly associated with initial marijuana use early in adolescence

Medical Cannabis and Opioid Use


http://dhhs.nv.gov/


https://www.drugabuse.gov

Limited evidence that there are fewer opioid overdose deaths than expected in states with legal medical marijuana.

Colorado Department of Public Health and Environment. *Monitoring Health Concerns Related to Marijuana in Colorado: 2016.* https://www.colorado.gov/cdphe/marijuana-health-report. Accessed March 2, 2018.

The JAMA Network

From: **Medical Cannabis Laws and Opioid Analgesic Overdose Mortality in the United States, 1999-2010**

States with medical cannabis laws had a 24.8% lower mean annual opioid overdose mortality rate (95% CI,−37.5% to −9.5%; P = .003) compared with states without medical cannabis laws.

This association strengthened over time

Year 1 (−19.9%; 95% CI,−30.6% to -7.7%; *P* = .002)
Year 2 (−25.2%; 95% CI,−40.6% to −5.9%; *P* = .01)
Year 3 (−23.6%; 95% CI,−41.1% to −1.0%; *P* = .04)
Year 4 (−20.2%; 95% CI,−33.6% to −4.0%; *P* = .02)
Year 5 (−33.7%; 95% CI,−50.9% to -10.4%; *P* = .008)
Year 6 (−33.3%; 95% CI,−44.7% to -19.6%; *P* < .001)

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JAMA Intern Med. 2014;174(10):1668-1673. doi:10.1001/jamainternmed.2014.4005

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Medical Cannabis and Opioid Use

- 244 medical cannabis patients with chronic pain in Michigan
- Survey of 46 questions
  - Medical condition(s) for which cannabis was used
  - Method/frequency of cannabis use
  - Changes in noncannabis medication use
  - Changes in medication side effects
  - Quality of life changes since starting cannabis use
  - Demographic information
  - 2011 Fibromyalgia Survey Criteria (0-31 score)

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J Pain. 2016 Jun;17(6):739-44. doi: 10.1016/j.jpain.2016.03.002. Epub 2016 Mar 19.

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OUTCOME OF INTEREST	PATIENT RESPONSES (n=244) Mean (SD)
Fibromyalgia score (0-31)	9.23 (5.52)
Opioid use change	−63% (46%)
Degree to which side effects of medication affect daily function (before using medical cannabis); scale from 1 to 10	6.44 (2.91)
Degree to which side effects of medication affect daily function (after using medical cannabis); scale from 1 to 10	2.77 (2.35)
Number of medication classes used (before cannabis use)	2.35 (1.43)
Number of medication classes used (after cannabis use)	1.82 (.94)
Quality of life change	45% (28%)

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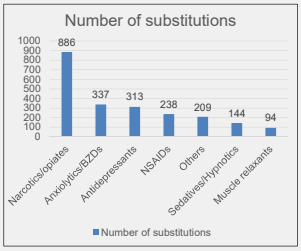
J Pain. 2016 Jun;17(6):739-44. doi: 10.1016/j.jpain.2016.03.002. Epub 2016 Mar 19.

Cannabis as a Substitute for Prescription Drugs

- 1,248/2,774 patients that used cannabis in past 90 days reported using cannabis as a substitute for Rx drugs
- 2,473 substitutions reported (~2/patient)
- Odds 4.59 (95% CI, 3.87–5.43) greater among medical cannabis users vs. non-medical users
- 24% of non-medical users reported substituting cannabis for Rx drugs
- State cannabis laws did not influence decision to substitute cannabis



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J Pain Res. 2017;10:989-998. doi: 10.2147/JPR.S134330.

Cannabis Use and Risk of Prescription Opioid Use Disorder

- Determine associations between cannabis use at "wave 1" (2001-2002) and nonmedical prescription opioid use and prescription opioid use disorder at "wave 2" (2004-2005)
- Increased use and disorder
  - Nonmedical opioid use: adjusted OR=2.62, 95% CI=1.86-3.69
  - Opioid use disorder: adjusted OR=2.18, 95% CI=1.14-4.14
- In patients with pain
  - Nonmedical opioid use: adjusted OR=2.99, 95% CI=1.63-5.47
  - Opioid use disorder: adjusted OR=2.14, 95% CI=0.95-4.83

Cannabis use appears to increase risk of developing nonmedical prescription opioid use and opioid use disorder.

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Am J Psychiatry. 2018 Jan 1;175(1):47-53. doi: 10.1176/appi.ajp.2017.17040413

Summary: Therapeutic and Adverse Effects

Cannabis may have a role in chronic pain, especially neuropathic pain, and pediatric epilepsy when patients have failed other treatments.

Mortality from and use of opioids may decrease with cannabis use.

Adverse effects occur-benefits and risks should be weighed individually while considering patient safety and public health concerns.

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- Describe the clinical pharmacology of cannabis and its active components.
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- Identify potential drug interactions and other patient safety issues that may occur with the use of medical cannabis.
- Review important counseling strategies and hospital policies for patients considering medical cannabis use.

Poll Question

Which of the following medications can have a potential drug interaction with medical cannabis?

1. Amitriptyline
2. Lisinopril
3. Metoprolol
4. Quetiapine

Drug Interactions

Cannabinoid	CYP-450 2C9	CYP-450 2C19	CYP-450 3A4
Δ9-THC	*		*
Δ8-THC	*		*
CBD		*	*
CBN	*		*

Drug Metab Rev. 2014;46(1):86–95

Clinically Important Drug-Drug Interactions

- Chlorpromazine
- Clobazam
- Clozapine
- CNS depressants
- Disulfiram
- Hexobarbital
- Hydrocortisone
- Ketoconazole
- Protease inhibitors (indinavir, nelfinavir)
- MAO inhibitors
- Phenytoin
- Theophylline
- Tricyclic antidepressants
- Warfarin

*Note: significant synergistic interaction found between CBD and levetiracetam. Significant antagonistic interactions noted with CBD + clobazam and CBD + carbamazepine.

Colorado Department of Public Health and Environment. *Monitoring Health Concerns Related to Marijuana in Colorado: 2016.* https://www.colorado.gov/cdphe/marijuana-health-report Accessed March 1, 2018.

Patient Safety Issues

- Unintentional exposure
- Adverse effects
- Drug interactions
- Accuracy of education provided
- Consistency (or lack thereof)
- Quality and purity
- Packaging
- Labeling
- Testing – content and contaminants

Photos: http://www.oregon.gov/oha/marijuana/Pages/PackagingLabelingProApproval.aspx (accessed 2018 April 1)

Objectives

- Identify the current status of cannabis in the United States.
- Describe the clinical pharmacology of cannabis and its active components.
- Evaluate and discuss clinical studies performed in patients with various conditions to determine the effectiveness and adverse effects of medical cannabis.
- Identify potential drug interactions and other patient safety issues that may occur with the use of medical cannabis.
- Review important counseling strategies and hospital policies for patients considering medical cannabis use.

Patient Case

2 yo male with lethargy is brought to the emergency department of Children's Hospital Colorado. Several tests are performed including:

- Urinalysis
- Comprehensive metabolic panel
- Complete blood count
- APAP/ASA levels
- EKG
- Urine toxicology
- CT head
- Chest X-ray

https://www.cdc.gov/features/sleep/

What are potential causes of his lethargy? Should he be admitted?

JAMA Pediatr. 2013;167(7):630-633. doi:10.1001/jamapediatrics.2013.140

Patient Case, con't

- Admitted to hospital
- Unintentional exposure to marijuana
- Source of marijuana: babysitter

https://www.cdc.gov/features/sleep/

What counseling should occur for this patient and/or family?

JAMA Pediatr. 2013;167(7):630-633. doi:10.1001/jamapediatrics.2013.140

Patient Case

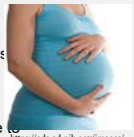
- 17 yo male displays unusual behavior in the classroom and is brought to the counselor's office
- Counselor verifies that the student is high and obtained cannabis (gummy bears) from a friend
- Student admits to using cannabis several times per week; claims it reduces his anxiety and anger
- Student does not think it impacts his school grades or ability to play sports (football and basketball)

https://www.justthinktwice.gov/

What counseling should occur for this student?

Patient Case

- 27 yo female comes to clinic for second trimester prenatal vis (24 weeks pregnant)
- Medications: prenatal vitamin once daily
- Social history: no alcohol, no tobacco, smokes cannabis one to two times daily
  - Initially started cannabis to relieve nausea in first trimester; continued cannabis because it "improved sleep"
- She has heard about cannabis having potential harm on the fetus, but doesn't think studies were done well enough to make conclusions about harm; feels benefits outweighs any risks



https://ods.od.nih.gov/images/content/Woman-Pregnant.jpg

What counseling should occur for this patient?

Patient Case

- 62 yo female with long-standing diabetes and severe neuropathic pain; other conditions include hypertension, dyslipidemia, and arthritis
- For neuropathic pain and arthritis, she has tried seven different FDA-approved or OTC medications; currently taking APAP, oxycodone and pregabalin
- Started cannabis about 3 months ago
  - Vaporizes THC:CBD (1:1) twice daily
- Reduced oxycodone dose by 30% since cannabis; has continued APAP, pregabalin and cannabis

https://www.womenshealth.gov/files/assets/images/images new/woman-sunscreen.jpg

What counseling should occur for this patient?

Counseling Strategies: Medical Cannabis

- Reason for use
  - "Patients use cannabis for many different conditions. For what condition(s) are you using cannabis?"
- Cannabis use (formulation, dose, frequency)
  - "By what method(s) do you use cannabis?"
  - "What strain and/or cannabinoid concentrations are you using?"
  - "How often are you using cannabis?"
- Concurrent drug use
  - "What other medications are you taking at this time?"
  - Screen for drug interactions

Res Social Adm Pharm 2016;12(4):638-54. doi: 10.1016/j.sapharm.2015.09.002

Counseling Strategies: Medical Cannabis

- What to expect
  - "What benefits did your provider tell you to expect by using cannabis?"
  - "What adverse effects did your provider tell you to expect?"
- When to seek further medical attention
  - Bothersome psychoactive effects
  - Cannabinoid hyperemesis syndrome (cyclic vomiting)
  - Withdrawal symptoms (if discontinuing)
- Follow-up when needed
  - Contact pharmacist or prescriber if any adverse effect becomes too bothersome or if any questions about marijuana use

Res Social Adm Pharm 2016;12(4):638-54. doi: 10.1016/j.sapharm.2015.09.002

Role Play: Counseling in Pregnancy

https://youtu.be/0EZuZzyn8yY

Summary

Counseling strategies vary based on individual patient situations. Efforts should be made to determine medical history, medication history, social history, and other patient-specific factors to determine what, why, and how cannabis is being used.

Conclusions

- Despite a majority of states with medical cannabis laws enacted, cannabis remains illegal in the United States.
- The endocannabinoid system, including CB1 and CB2 receptors, is the key target for exogenous cannabinoids.
- Clinical studies indicate cannabis may have a role in patients with neuropathic pain and pediatric epilepsy refractory to other treatments.
- Risk for potential adverse events may or may not outweigh benefit provided.
- Providers should be aware of potential drug interactions and patient safety issues need to be considered such as packaging and labeling.
- Patient-provider communication is key to optimize patient outcomes.

QUESTIONS?

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