

MEDICAL MARIJUANA PANEL: HAZE OF CHANGE

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DISCLOSURE

Under guidelines established by the Accreditation Council for Pharmacy Education, disclosure must be made regarding financial relationships with commercial interests within the last 12 months.

I have no relevant financial relationships or affiliations with commercial interests to disclose.

LEARNING OBJECTIVES

At the completion of this activity, pharmacists will be able to:

- ▶ Describe the history and the criminal and legal evolution of cannabis over the last century.
- ▶ Evaluate the impact of the criminalization vs. the legalization of cannabis within a state.
- ▶ Compare the laws of multiple states that have legalized cannabis with the current Oklahoma statute

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PRE-ASSESSMENT QUESTIONS

- ▶ Which of the following statements is incorrect?

- A. Harry Anslinger, director of Bureau of Narcotics, authored the Marihuana Tax Act of 1937, giving the government the ability to outlaw marijuana by way of taxes or fines.
- B. The Boggs Act of 1951, resulted in minimum sentences for possession or sale of narcotics, and rise of the Gateway Theory.
- C. Marijuana was categorized as a Schedule I narcotic in the Controlled Substances Act of 1970 due to its adverse effect of "Amotivational Syndrome" reported by the Sherman Commission.
- D. The first state to outlaw marijuana was California in 1913.

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- ▶ Which of the following statement(s) regarding the impact of legalization in Colorado is true?
 - A. Number of hospitalizations due to marijuana toxicity, increased by 78% after legal and commercialized, compared to before medicinal.
 - B. After full legalization, traffic accidents resulting in fatalities increased 50%; 18% in 2013 vs 32% in 2017.
 - C. Training and implementation of peace officers as DREs has resulted in a significant increase in the percentage of marijuana related DUIs.
 - D. Edibles result in overdose death, due to Cannabinoid Hyperemesis

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- ▶ Which of the following are (is) true regarding Oklahoma Marijuana Program and laws?
 - A. Caregiver's license expires when the license of the individual they are caring for expires or two years, which ever is the lesser.
 - B. Now legal for 17 year olds to obtain 72 ounces of marijuana in a single purchase.
 - C. Marijuana users will be subject to the same restrictions as tobacco under, Title 63 of Oklahoma statutes, the "Smoking in Public Places and Indoor Workplaces Act."
 - D. Employers may take action against an employee that is a license holder, whether or not they use or possess marijuana at place of employment or during working hours.

6

KNOWLEDGE CHECK

► Place the following facts in order of occurrence, in regards to the history or marijuana and its introduction into the U.S.?

- A. 1) In U.S. Pharmacopeia with actions & uses: as a narcotic poison, producing mild delirium. Used in sedative mixtures, but of doubtful value.
- B. 2) Immigrants escaping the Mexican Revolution; most significant introduction and dispersion of marijuana.
- C. 3) Published for use as a tincture for cataracts by Dr. Trinks, in the *Materia Medica*
- D. 4) Used in Egypt to make dawamesk, typically incorporated into breads like a Danish
- E. 5) List in U.S. Pharmacopeia, as Cannabis, formulation tincture, no mention of uses.

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HISTORY OF MARIJUANA (CANNABIS) IN THE U. S.

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EARLY MEDICINAL HISTORY OF MARIJUANA

Central Asia & Beyond

- ▶ Hasheesh
- ▶ Charas
- ▶ Ganja
- ▶ Bhang
- ▶ Dawamesk
 - ▶ A marmalade, used in breads



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EARLY MEDICINAL HISTORY OF MARIJUANA

- ▶ **Materia Medica**
 - ▶ Dr. Trinks, 1841
 - ▶ Eye drops-cataracts
 - ▶ Tincture

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U. S. PHARMACOPEIA

- ▶ 1850
- ▶ 1909
- ▶ 1916
- ▶ 1921
- ▶ 1942



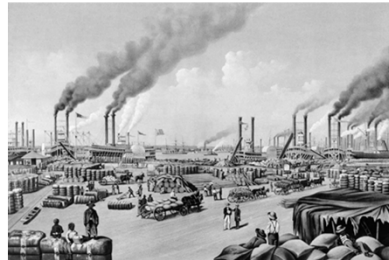
Cannabis

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HOW DID IT GET HERE?

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Sources and Entry



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AN OUTLAW

- California in 1913
- Utah in 1915
- Texas in 1919
- New Mexico 1923
- New Orleans 1924

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AN OUTLAW



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LEGAL EVOLUTION OF MARIJUANA

- ▶ Prohibition Bureau
 - ▶ The Harrison Act of 1914
- ▶ Narcotics Drug Import & Export Act of 1922
- ▶ The Indian Hemp Drugs Commission, 1893-94
- ▶ U.S. Army, Panama Canal Zone, 1925

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LEGAL EVOLUTION OF MARIJUANA

- ▶ Bureau of Narcotics, 1930
 - ▶ Harry Anslinger
 - ▶ Marihuana Tax Act of 1937
 - ▶ Registered : \$1 per oz.
 - ▶ Not registered: \$100 per oz.
 - ▶ End to marijuana research
- **Avg. Cost of Living 1936:**
 - ▶ New house \$3,925
 - ▶ Annual wages \$1,713
 - ▶ Gas 10 cents/gallon
 - ▶ House rent \$24/ month
 - ▶ Lb. of Hamburger Meat 12 cents
 - ▶ Studebaker Car \$665.00

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LEGAL EVOLUTION OF MARIJUANA

- ▶ Hale Boggs' attack on heroin
- ▶ "The Narcotics Farm," Lexington, KY
- ▶ Gateway Theory
- ▶ Boggs Act of 1951
 - ▶ Minimum sentences
 - ▶ No distinction



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LEGAL EVOLUTION OF MARIJUANA

- ▶ Leary v. Unites States, 1969
- ▶ Controlled Substances Act, 1970
 - ▶ Comprehensive Drug Abuse Prevention & Control Act
 - ▶ Five Schedules
 - ▶ Shafer Commission
 - ▶ “Amotivational Syndrome”
- ▶ “The Marijuana Dilemma and the Army of the Seventies”

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LEGAL, MEDICINAL, OR CRIMINAL?

- ▶ Schedule I Drug
- ▶ State Level
- ▶ Implemented with little evidence
 - ▶ Studies
 - ▶ Criminal Data
- ▶ Imprisoned for possession

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IMPACT OF THE CRIMINALIZATION VS THE LEGALIZATION

- ▶ 2012, 181,900 federal offenses
 - ▶ 93,000 were for a drug related offense
 - ▶ 11,533 included a marijuana offense
 - ▶ 1,072 were for marijuana only
 - ▶ 23 were for possession
 - ▶ Avg. 115lbs.
 - ▶ 1 ounce ~ 83 joints

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IMPACT OF THE CRIMINALIZATION VS THE LEGALIZATION

- ▶ 122 Federal prisons
 - ▶ 8 inmates each
- ▶ Cost Avoidance:
 - ▶ \$36,299.25 per inmate per year
 - ▶ \$37 million for 8 inmates for 1 year
- ▶ Don't forget the state and local level costs
- ▶ https://www.bop.gov/about/statistics/population_statistics.jsp

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CALIFORNIA

- ▶ 1996: Compassionate Use Act, allowing for the medical use of marijuana.
- ▶ 2003: expanded the state's medical marijuana law to allow patients and caregivers to collectively or cooperatively cultivate marijuana.
- ▶ 2015: enacted a licensing and regulatory system for medical marijuana businesses.
- ▶ 2016: legalizing marijuana for adults, establishing a regulated marijuana market.
- ▶ 2017: Licensing and regulatory system for medical marijuana businesses is paired with similar regulatory system being developed for non-medical, now under one agency.
- ▶ 2018: First legal sales for adult consumers began!

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COLORADO

- ▶ 2000-2009: medicinal approved; Medical Marijuana Registry program, ID cards, legal protection under state law
- ▶ 2010-2012: medical commercialized and regulated, licensed dispensaries, growers, and product manufacturers
- ▶ 2014: fully legalized, decriminalized, and commercialized
- ▶ 2019: one provider; and each parent or guardian

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COLORADO

- ▶ Challenges of users, especially minors
 - ▶ Probationers testing positive:

Age (# Positive Tests)	2012	2014
10-14 yo (1-2 +THC)	19%	23%
10-14 yo (3-4 +THC)	18%	25%
15-17 yo (1-2 +THC)	26%	25%
15-17 yo (3-4 +THC)	23%	25%

COLORADO

- ▶ DUI
 - ▶ Peace Officers/Drug Recognition Experts

	2014	2015	2016	2017
Alcohol Only	4,820	4,042	3,610	3,871
Marijuana Only	359	335	388	335
Marijuana & Alcohol	213	210	239	216
Marijuana & other drugs	112	107	153	168
Other drugs	201	204	245	259
Total Marijuana Citations	684	652	780	719
Total DUI Citations	5,705	4,898	4,605	4,849

*for perceived impairing substance and tested

COLORADO

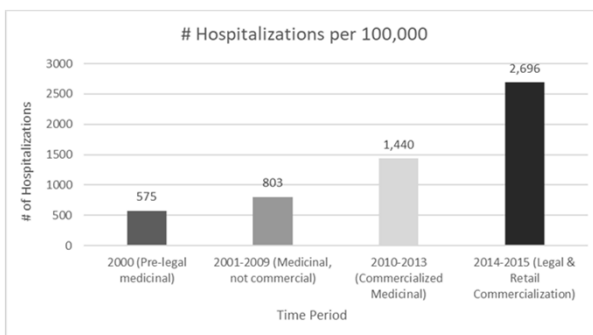
- ▶ Traffic Accidents/Fatalities
- ▶ How much of an increase?

	2013	2017
Cannabinoid-only/Cannabinoid-in combination	55	139
Cannabinoid-only	23	46
Percentage of Fatalities	18%	32%

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COLORADO

- ▶ Hospitalizations



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NOT THE SAME MARY JANE

- ▶ Potency debate
 - ▶ 10-30% (2009), 2-7% (since '70s), or higher?
 - ▶ Oklahoma: 20% THC, 50% oil & edible
 - ▶ Crossbreeding and genetic modification => 30% THC and higher
- ▶ Colorado Hospitalizations:
 - ▶ Smoking-----Cannabinoid Hyperemesis
 - ▶ EDIBLES!
 - ▶ 1-3 hour onset, up to 12 hour duration

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MARIJUANA “OVERDOSE” ?

- ▶ Symptoms:
 - ▶ Extreme anxiety or panic attacks
 - ▶ Psychotic reactions: loses touch with reality or becomes paranoid
 - ▶ Decreased judgment, perception, and coordination
 - ▶ A fast heart rate, chest pain, or heart attack
 - ▶ Uncontrollable shaking or seizures
- ▶ Toxicity or “Overdose?”
 - ▶ Cardiovascular overdose = cardiotoxic overdose
 - ▶ Deaths

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OKLAHOMA STATUTE

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OKLAHOMA STATUTE

- ▶ Oklahoma Statute, Section 420 of Title 63
- ▶ 30th State –June 26, 2018
- ▶ July 26, 2018, misdemeanor, fine \$400—”state a medical condition”
- ▶ Aug. 25, 2018—applications, Sept. sales
- ▶ Oct. 26, 2018--\$400 fine—simple possession
- ▶ Oklahoma Medical Marijuana Authority (OMMA)
- ▶ May 6, 2019—approved/received licenses:
 - ▶ Patients: 108,696/115,977 (93.7%)
 - ▶ Caregivers: 1,398/1,778 (78.6%)
 - ▶ Dispensaries: 1,445
 - ▶ Growers: 2,819
 - ▶ Processors: 782

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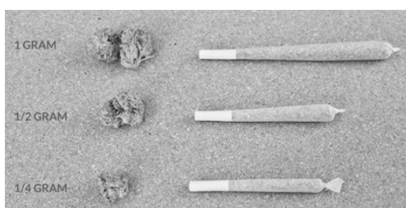
OKLAHOMA STATUTE

- ▶ Consume marijuana (medical purpose)
- ▶ Up to three ounces of marijuana on their person
- ▶ Six mature marijuana plants
- ▶ Six seedling plants
- ▶ One ounce of concentrated marijuana
- ▶ Seventy-two ounces of edible marijuana
- ▶ Up to eight ounces of marijuana in their residence

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WHAT'S IN AN OUNCE?

- ▶ The difference in **joint** size will ultimately result in a wild variation in the number of **joints** a person can roll from one ounce of **cannabis**. At 0.32 grams you would expect about 87 **joints**, from an ounce. and at 0.7 grams you would only have about 40 **joints**., from an ounce.



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OKLAHOMA STATUTE

- ▶ OMMA
- ▶ <http://omma.ok.gov/>
- ▶ TITLE 310. OKLAHOMA STATE DEPARTMENT OF HEALTH
CHAPTER 681. MEDICAL MARIJUANA CONTROL PROGRAM
- ▶ *remaining slides subject to change*

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MEDICAL MARIJUANA LICENSE

- ▶ Application Fee:
 - ▶ Patient &/caregiver: \$100
 - ▶ \$20 if on Medicaid, Medicare, or SoonerCare
 - ▶ Dispensary, grower, processor, or transporter: \$2,500
- ▶ Expiration:
 - ▶ 2 years (*caregiver*)
- ▶ Visitors:
 - ▶ Temporary license....30 days, \$100
 - ▶ State of home has regulated medical marijuana program
- ▶ **MUST** be a registered recommending physician
 - ▶ As of MAY 7, 2019---does not have to prove BOARD certification

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OKLAHOMA MEDICAL MARIJUANA LICENSE



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ACCEPTED PHOTO IDENTIFICATION

- ▶ Oklahoma driver's license /identification card (red)
- ▶ U.S. passport/other photo ID issued by the U.S government
- ▶ U. S. Bureau of Indian Affairs identification card
- ▶ Tribal, issued on or after Jan. 8, 2008:
 - ▶ Muscogee (Creek) Nation of Oklahoma
 - ▶ Kiowa Comanche
 - ▶ Apache of Oklahoma
 - ▶ Absentee Shawnee
 - ▶ Cheyenne-Arapaho
 - ▶ Choctaw
 - ▶ Delaware
 - ▶ Caddo Nation of Oklahoma

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CAREGIVER OR UNDER 18

- ▶ Caregiver:
 - ▶ Proof of patients medical license holder and homebound status
 - ▶ Proof designated caregiver
 - ▶ Proof 18 years or older & Oklahoma resident
 - ▶ Expires when patient's license expires

- ▶ Under 18:
 - ▶ Special exception
 - ▶ 2 physician signatures
 - ▶ Parent/legal guardian signature
 - ▶ License good for 2 years or until 18 y.o.

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FUTURE CHANGES TO THE STATUTE

- ▶ Testing, annual inspections
- ▶ Single Transaction Limits (Disp. 1:3:6:6:72)(Processor 1 oz. conc.)
- ▶ Monthly Reporting & Records Maintenance
- ▶ Food Safety
- ▶ Storage & Security, Theft (report 24 hrs)
- ▶ <https://www.ok.gov/health2/documents/310-681%20Permanent%20Medical%20Marijuana%20Packet.pdf>

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DISCRIMINATION & DISQUALIFICATION

- ▶ Employers may not take action against a license holder
- ▶ Employer may take action if holder uses or possesses marijuana in the place of employment or during the hours of employment.

- ▶ Criminal history background check within 30 days prior to the application for the license
- ▶ Disqualifying Criminal Conviction:
 - ▶ Non-violent felony within last 2 yrs
 - ▶ Any violent felony within last 5 yrs
 - ▶ Incarceration for any reason during submission of application

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PUBLIC HEALTH CONCERNS

- ▶ Evidenced-based policies and promising practices
 - ▶ remains limited on

- ▶ Will require packaging & labeling:
 - ▶ Not attractive to minors
 - ▶ Label reads: "Keep out of reach of children;" child resistant packaging
 - ▶ Label warning states "Women should not use marijuana or medical marijuana products during pregnancy because of the risk of birth defects."

- ▶ Health concerns of smoke and second hand smoke & effects produced by consumption of some forms of marijuana.

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IMPACT ON MEDICAL PRACTICE

- ▶ A medical marijuana license holder's authorized use of marijuana must be considered the equivalent of the use of any other medication under the direction of a physician
- ▶ And does not constitute the use of an illicit substance or otherwise disqualify a registered qualifying patient from medical care.

- ▶ Department of Health
 - ▶ Partnerships with Poison Control, hospitals, and others
 - ▶ Tracking adverse events
 - ▶ REPORT! REPORT!

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IMPACT ON RX PRACTICE

- ▶ Packaging & Labeling
- ▶ Concerns—of patients or family...about second hand smoke
- ▶ Valid License Verification
- ▶ The patient's costs
 - ▶ \$20-\$100 license, Office visit(s) fees, & \$400/oz
- ▶ CBD Availability
 - ▶ Naturally occurring 5%
 - ▶ Epidiolex, ~99%

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IMPACT ON PRACTICE

- ▶ Be an open minded SKEPTIC
- ▶ Report!!
- ▶ Keep up-to-date
- ▶ MOST importantly.....

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DOCUMENT!

DOCUMENT!

DOCUMENT!

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DOCUMENT

- ▶ Legal use: copy license, name of physician
- ▶ What are they using?
 - ▶ Forms
 - ▶ Strengths
 - ▶ Trends
 - ▶ Dabbing
- ▶ Education on known and the potential unknown interactions
- ▶ Psychosis
- ▶ Cancer
- ▶ Youth (<16 yo)

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SUMMARY

- ▶ Medicinal uses for centuries
- ▶ Need more clinical trial data
- ▶ Be cautious and cognizant
- ▶ Report
- ▶ Keep up-to-date
- ▶ Expect more changes
- ▶ Federal sites and employees

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POST-ASSESSMENT QUESTIONS

► Which of the following statements is incorrect?

- A. Harry Anslinger, director of Bureau of Narcotics, authored the Marihuana Tax Act of 1937, giving the government the ability to outlaw marijuana by way of taxes or fines.
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REFERENCES
UPON REQUEST
(SHANNON.LOWE@IHS.GOV)

QUESTIONS

HAZE OF CHANGE

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LCDR U.S. Public Health Service
Haskell Indian Health Center

Decriminalization of Cannabis

Implications for the Pharmacist

Brandi Watts Pharm. D. BCACP
Inpatient Clinical Pharmacy Coordinator

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Learning Objectives

At the completion of this activity, pharmacists will be able to:

- Examine the clinical pharmacology of cannabis and its active components
- Review the current research on medical cannabis in children and adults with various medical conditions
- Identify the symptoms of cannabis intoxication and the potential drug-drug interactions

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Pre-assessment Questions

Endocannabinoids include all of the following except?

- A. Anandamide (AEA)
- B. Cannabidiol (CBD)
- C. 2-Arachidonoylglycerol (2-AG)

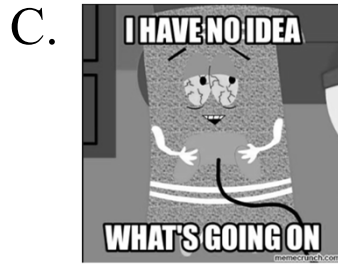
Where are cannabinoid receptors located in the body?

- A. Central Nervous System
- B. Reproductive System
- C. Bone Marrow
- D. All of the above

You can test positive for THC when taking cannabidiol (Epidiolex)?

A. Yes

B. No



All of the following have been identified as side effects of cannabis use except:

- A. Cyclic vomiting
- B. Muscle cramping
- C. Orthostatic hypotension
- D. Dry mouth

Learning Objectives

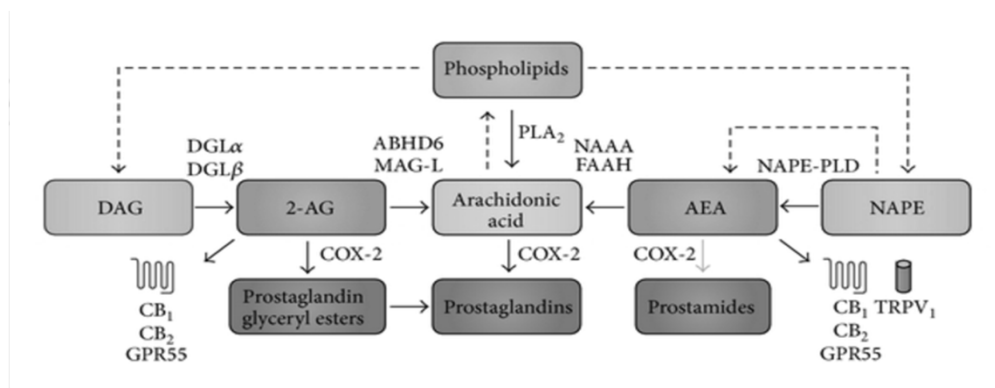
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Endocannabinoid System

Endocannabinoids

- Anandamide (AEA)
- 2-Arachidonoylglycerol (2-AG)

Production and Metabolism of AEA and 2-AG



THE ENDOCANNABINOID SYSTEM

HUMAN CANNABINOID RECEPTORS

CB1

Receptors are concentrated in the brain & the central nervous system but are also present in some nerves and organs.

CB2

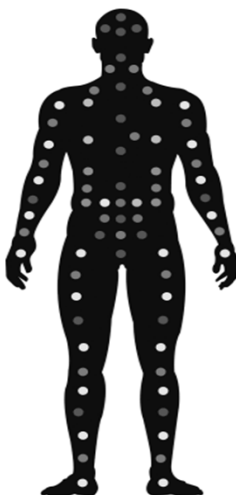
Receptors are mostly in peripheral organs, especially cells associated with the immune system.

TRPV1

Receptors are concentrated in the blood, bone, marrow, tongue, kidney, liver, stomach & ovaries.

TRPV2

Receptors are concentrated in the skin, muscle, kidney, stomach & lungs.



GPR 18

Receptors can be found primarily in bone marrow, the spleen and lymph nodes, and to a lesser extent the testes

GPR55

Receptors are found in the bones, the brain, particularly the cerebellum, and the jejunum and ileum.

GPR 119

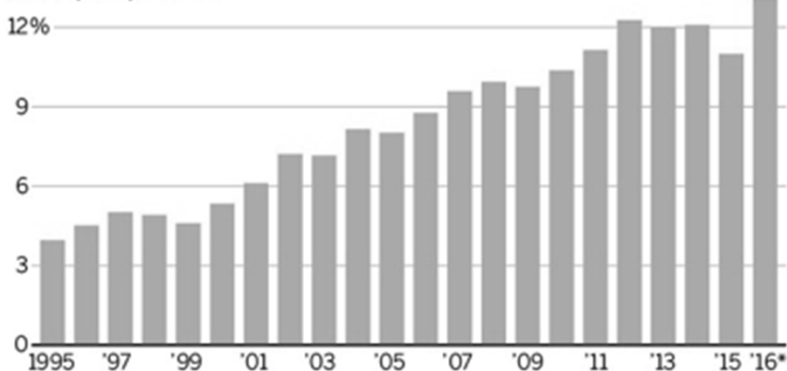
Receptors are found predominantly in the Pancreas and the intestinal tract, in small amounts



[/MCANewZealand/](#)
[@MCANewZealand](#)
mcanewzealand.org/

HIGHER AND HIGHER

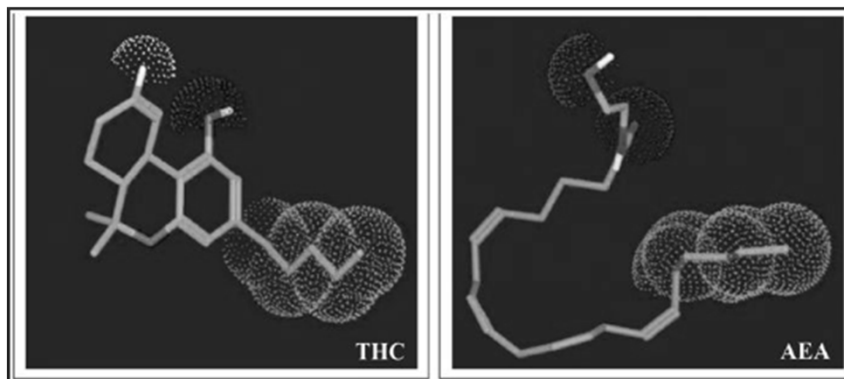
The chart below shows the rise in average THC content in cannabis plants seized by government authorities over the past two decades. Boutique growers are now producing strains that top 30 percent.



*Current year only reflects data sampled through Sept. 22.

Source: Potency Monitoring Program, University of Mississippi, School of Pharmacy

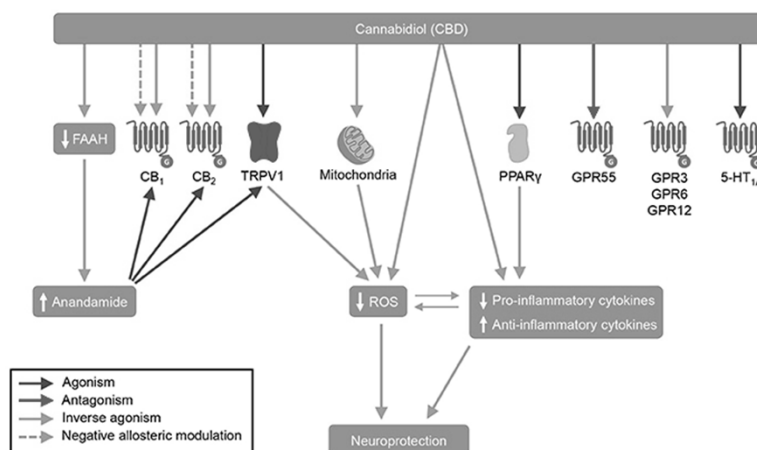
Δ^9 -Tetrahydrocannabinol and Anandamide



Mechanism of Action of THC

- CB1 and CB2 receptors
- Opioid receptors
- Benzodiazepine receptors
- Prostaglandin synthetic pathway
- Nucleic acid metabolism

Mechanism of Action of CBD



Learning Objectives

- Examine the clinical pharmacology of cannabis and its active components
- Review the current research on medical cannabis in children and adults with various medical conditions
- Identify the symptoms of cannabis intoxication and the potential drug-drug interactions

FDA Approved Medications

- Dronabinol (Marinol, Syndros)
- Nabilone (Cesamet)
- Cannabidiol (Epidiolex)

Dronabinol

- Approved indications
- Dosing
- Contraindications
- Adverse Effects



Nabilone

- Approved Indications
- Dosing
- Adverse effects



Cannabidiol

- Approved Indication
- Dosing
- Adverse effects
- Monitoring



Current Cannabis Research

CBD

- Autoimmune hepatitis (AIH)
- Fragile X syndrome
- Ischemia-reperfusion syndrome
- Dermatomyositis

Current Cannabis Research

THC:CBD

- Multiple Sclerosis

THC

- Epilepsy

CBG

- Huntington's Disease

Resources for Current Cannabis Research

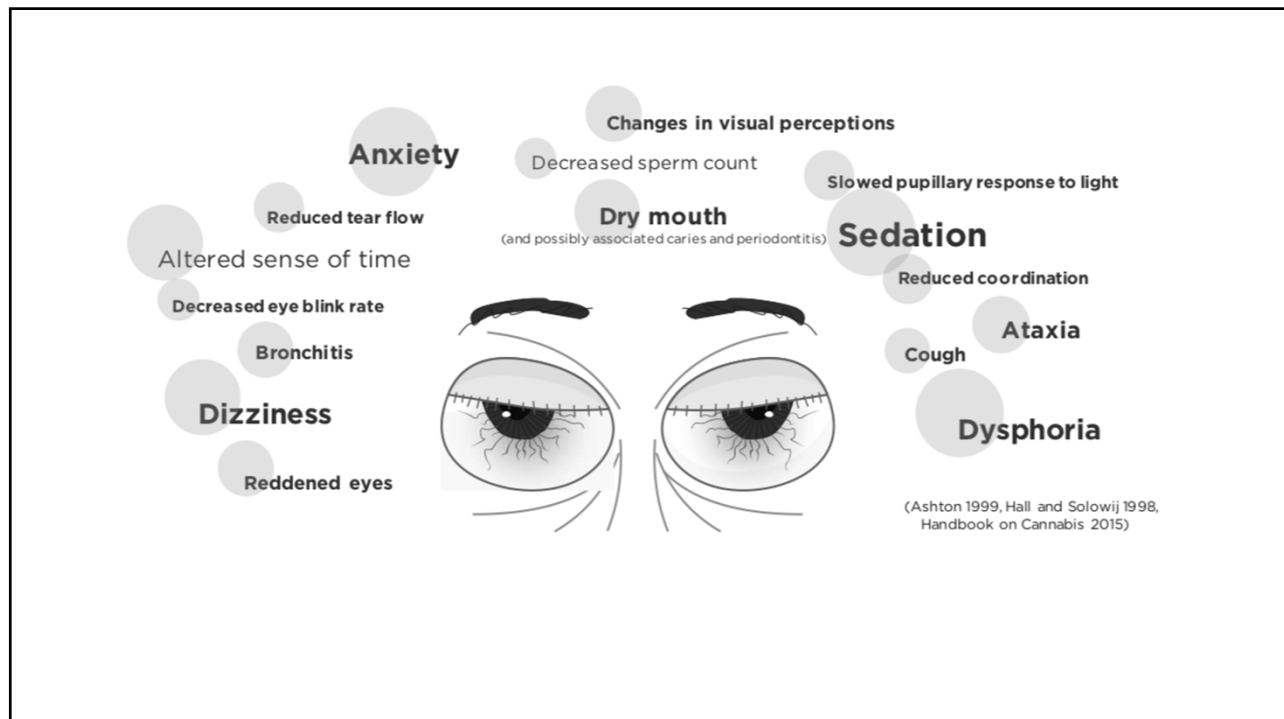
<https://www.colorado.gov/pacific/marijuanahealthinfo>

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.

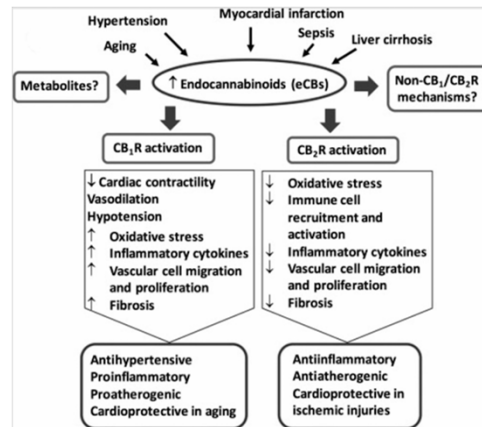
<https://www.fda.gov/newsevents/publichealthfocus/ucm421168.htm>

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- Review the current research on medical cannabis in children and adults with various medical conditions
- Identify the symptoms of cannabis intoxication and the potential drug-drug interactions



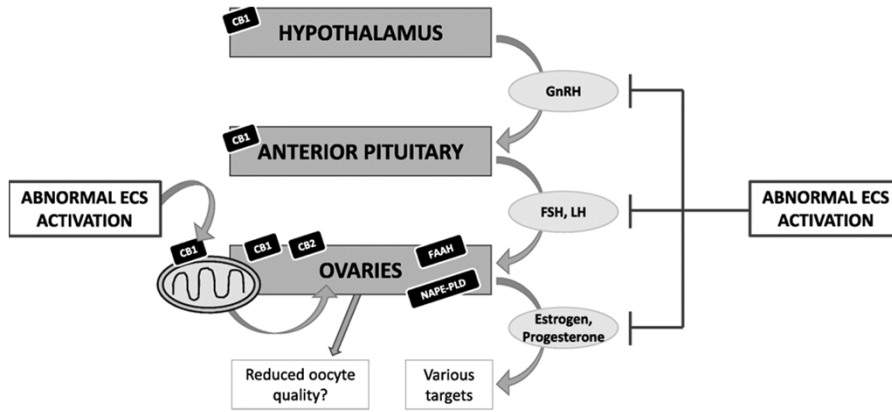
Effects on the Cardiovascular system



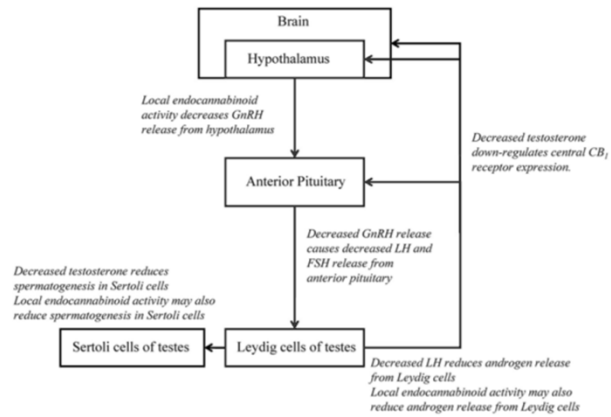
Effects on the Pulmonary System

- Malignant lesions in the airway
- Bronchitis
- Pneumonia

Effects on Female Reproductive System



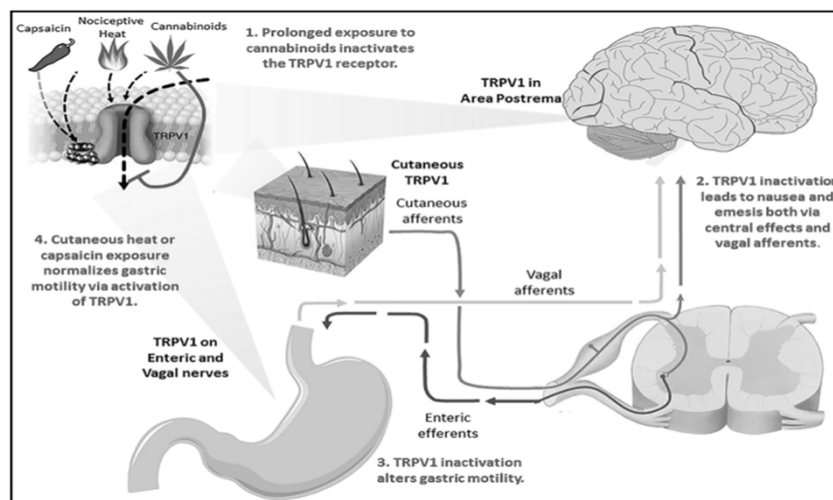
Effects on Male Reproductive system



Cognitive and Mental Health Effects

- Memory impairment
- Psychotic symptoms
- Altered brain development in adolescent users

Cannabinoid Hyperemesis Syndrome



Cannabis Use Withdrawal Symptoms

- Irritability
- Sleeping difficulties
- Dysphoria
- Craving
- Anxiety

Possible Drug Interactions

- THC induces CYP1A2
- CBD inhibits CYP3A4 and CYP2D6

Post-Assessment Questions

Endocannabinoids include all of the following except?

1. Anandamide (AEA)
2. Cannabidiol (CBD)
3. 2-Arachidonoylglycerol (2-AG)

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Where are cannabinoid receptors located in the body?

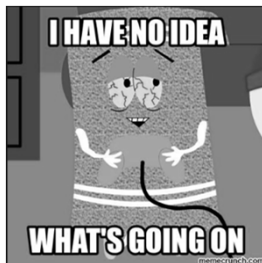
- A. Central Nervous System
- B. Reproductive System
- C. Bone Marrow
- D. All of the above

Where are cannabinoid receptors located in the body?

- A. Central Nervous System
- B. Reproductive System
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- D. All of the above

You can test positive for THC when taking cannabidiol (Epidiolex)?

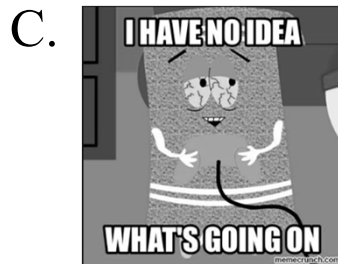
- A. Yes
- B. No
- C.



You can test positive for THC when taking cannabidiol (Epidiolex)?

A. Yes

B. No



All of the following have been identified as side effects of cannabis use except:

A. Cyclic vomiting

B. Muscle cramping

C. Orthostatic hypotension

D. Dry mouth

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- C. Orthostatic hypotension
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Summary

- Cannabis contains exogenous cannabinoids
- Research is showing support for cannabinoids for treatment of several disease states
- Cannabis can interact with medications and exacerbate disease states.

Implications for the Pharmacist

- Stay current on the legislative actions and research.
- Communicate effectively with patients using cannabis.
- Have clear policies and procedures in your practice sites addressing medical cannabis.

Decriminalization of Cannabis

Implications for the Pharmacist

Brandi Watts Pharm. D. BCACP
Inpatient Clinical Pharmacy Coordinator