

Cannabis Crash Course

Feel Better Prepared For Patient Care

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Pre-QUIZ

What is anandamide?

- a. Endocannabinoid
- b. Phytocannabinoid
- c. Synthetic Cannabinoid
- d. None of the above

When was the farm bill passed through legislation?

- a. 1952
- b. 2018
- c. 1969
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Pre-QUIZ

We have a system within our bodies which maintain homeostasis through regulation of cannabinoids.

- a. True
- b. False

Which CYP Enzymes can cannabis affect?

- a. CYP2CP
- b. CYP2D6
- c. CYP2C19
- d. All of the above
- e. None of the above

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Pre-QUIZ

Which of the following CBD products may show positive on a urine drug analysis for Delta-9-THC .

- a. Broad Spectrum
- b. Full Spectrum
- c. Isolate
- d. All of the above

Which of the following are schedule 1 substances?

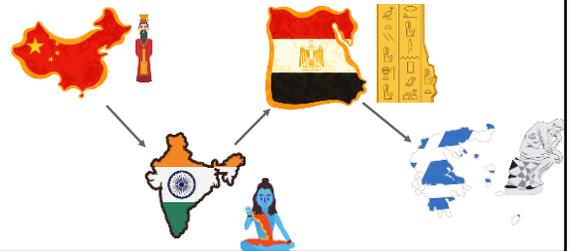
- a. Heroin
- b. Cocaine
- c. Quaaludes
- d. Marijuana
- e. All of the above

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Ancient History of Cannabis

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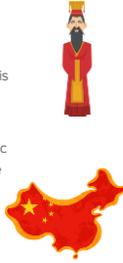
Cannabis in the Ancient World



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Cannabis in the Ancient World: China

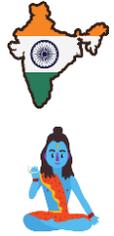
- Dating back to 2700 BCE, Emperor Shen-Nung aka "The Father of Chinese Medicine" compiled the Pen T'sao' (The Great Herbal) describing several medical uses for the cannabis plant
 - Included are uses for menstrual pain, rheumatism, gout, malaria and beriberi and many other ailments
- Second Century AD Hua T'o utilized cannabis as an anesthetic
- Recently excavated braziers point to recreational/spiritual use of cannabis over 2,500 years ago.



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Cannabis in the Ancient World: India

- Most of our knowledge of the use of cannabis in ancient Indian society comes from the ancient Hindu scriptures known as The Vedas written between 1500 and 500 BCE.
 - Cannabis is listed as one of the 5 sacred crops alongside barley and soma
- The earliest mention of cannabis as medicine has been traced back to 500 to 600 AD where it is referred to as anti-phlegmatic
 - Remedy for catarrh and biliary fever
- In Ayurveda cannabis was used to treat conditions of the digestive and respiratory tracts.
- Later evidence points to treatment of epilepsy and asthma



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Cannabis in the Ancient World: Egypt

- Much of our knowledge we have on ancient Egyptians comes from various surviving papyrus.
- Egyptian Medical Uses for Cannabis
 - Grind cannabis and celery to wash eyes of patients with glaucoma
 - The Ebers Papyrus dated around 1500 BCE listed a formulation of ground cannabis in honey to apply intravaginally for heat and pain
 - Ebers Papyrus topical treatment for painful fingers or toes included grinding cannabis, honey, ochre, hedjou resin and the ibou plant
 - The Berlin Papyrus shows a cannabis based ointment used to drive away fever
 - The Chester Beatty Papyrus written around 1300 BCE shows use of cannabis seeds to treat colorectal diseases, including cholera



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Cannabis in the Ancient World: Greece

- Various records from ancient Greece state use of cannabis seeds or flowers for various medical remedies.
- Some ailments treated with cannabis included inflammation, earache, and edema.
- Cannabis was often ground with other ingredients to make medicinal preparations for such ailments
- Cannabis seeds were steeped in water or wine, pressing out the liquid for medicinal use.

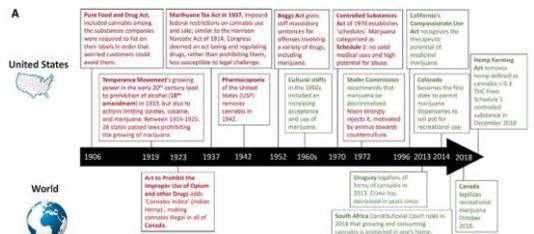


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Journey to the New World

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Summary of the evolution of cannabis policy



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The United States of Hemp

- North America was first introduced to hemp in 1606
- In the 1700s, farmers were legally required to grow hemp as a staple crop.
- America's founding fathers recognized that a thriving hemp industry was necessary for building an economically independent nation.
- Notable hemp growers:
 - George Washington
 - Thomas Jefferson
 - James Maddison
 - Benjamin Franklin
 - Henry Clay



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Pure Food & Drug Act 1906



- President Theodore Roosevelt signed the act into law in 1906-
 - Issued accurate labeling
 - Reduced adulterated food and drugs
 - Informed consumers and increase safety for products
 - Laid the groundwork for the escalating prohibitions that followed.
- Before that time, states set their own public health laws, and cannabis was considered medicine and sold in pharmacies.
- At this time, at the national level, there was no such thing as an illegal drug.

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Temperance Movement 1919 & 18th Amendment

- The 18th Amendment prohibited the manufacture, sale, or transportation of intoxicating liquors.
- In the early 20th century, the temperance movement was dedicated to promoting moderation, but more often abstinence from the use of intoxicating substances.
- This movement resulted in the limiting and prohibition of many substances including opioids, cocaine, and marijuana.
- Between 1914-1925, 26 states passed laws prohibiting the growing of marijuana.

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Marihuana Tax Act 1937



- Stopped the use of cannabis as a recreational drug.
- Industrial hemp was caught up the middle of anti-dope legislation, making hemp importation and production uneconomical.
- Scientific research and medical testing of marijuana virtually disappeared.

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Removal from USP

- The USP is an independent, nonprofit organization whose purpose is to improve global health through related programs that help ensure the quality, safety, and benefit of medicines and foods.
- First entry 1850 titled: "Extractum Cannabis, Extract of Hemp" an alcohol based extraction composed of dried cannabis flower
- Cannabis remained a USP listed drug for nearly a century
- Cannabis extracts remained in the USP until USP XII in 1940 after being criminalized by the 1937 Marihuana Tax Act

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The Boggs Act 1952

- Established mandatory sentencing for drug convictions
- A first offense conviction for marijuana possession carried a minimum sentence of 2 to 10 years and a \$20,000 fine.
- For the first time in US federal drug legislation, marijuana and narcotic drugs were lumped together.

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Controlled Substance Act 1970

- The Controlled Substance Act of 1970 regulated the manufacturing, importation, possession, use, and distribution of certain substances.
- Created 5 schedules or classifications for a substance
- The DEA and FDA determine which substances are added to or removed from the various schedules
- Marijuana is classified as a schedule I substance with the highest potential for abuse and addiction along with drugs like Heroin, LSD, Cocaine, MDMA (ecstasy).

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The Shafer Commission & Nixon Rejection

- Appointed by President Richard Nixon in the early 1970s, formally known as the National Commission on Marihuana and Drug Abuse.
- It took two years for the commission to issue a report entitled "Marihuana, a signal of Misunderstanding" calling for the decriminalization of marijuana possession in the United States.
- This report was ignored by the white house and the Nixon administration did not implement any of the Shafer Commission's recommendations.

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The Times They Are A-Changin

- **1996** - The Compassionate Use Act in California permitted the use of medical cannabis, recognizing the therapeutic potential of medical marijuana.
- **2014** - The state of Colorado legalizes recreational marijuana saving the state economy
- **2021** - New Mexico legalizes recreational use of marijuana.
- Since 2012, 16 states and Washington DC have legalized marijuana for adults 21 and older and 36 states have legalized medical marijuana

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United States Farm Bill 2018

- For decades, federal law did not differentiate hemp from other cannabis plants, all of which were effectively made illegal in 1937 after the Marihuana Tax Act and formally illegal under the 1970 Controlled Substance Act.
- The 2018 Farm Bill formally defined hemp, separating it from cannabis and effectively descheduling hemp as a Class I substances.



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Speaker Bio & Disclosure






JONATHAN RICKETTS
Pharmtrue



JEFFREY STENBERG
Pharmtrue



ROBERT MORRISON
Pharmtrue

Co-founders of Pharmtrue & Mesilla Valley Pharmacy.

Experimental use only; Marijuana is not FDA approved for any condition

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WHAT exactly is CANNABIS?

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Hemp vs. Marijuana

Hemp (Cannabis Sativa L.)	Marijuana (Cannabis Sativa L.)
<ul style="list-style-type: none"> Delta-9 THC concentration less than < 0.3% by dry weight Legal after the 2018 Farm Bill Agricultural Commodity 	<ul style="list-style-type: none"> Delta-9 THC concentration greater than > 0.3% by dry weight Approved for medical use in 33 states DEA Schedule 1 Controlled Substance

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The Endocannabinoid System

The neurotransmitter system responsible for the signaling of cannabinoids within our body. The ECS is made up of receptors which respond to both endogenous and exogenous chemical compounds (i.e., endocannabinoids, phytocannabinoids & synthetic cannabinoids) as well as being modulated by factors such as diet, sleep, exercise and stress.¹⁰

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Cannabinoids

Phytocannabinoids	Endocannabinoids	Synthetic cannabinoids
<ul style="list-style-type: none"> THC & CBD most well-known Over 100 different phytocannabinoids in cannabis 	<ul style="list-style-type: none"> Anandamide 2-arachidonoylglycerol Mimic receptor interaction of THC and other phytocannabinoids 	<ul style="list-style-type: none"> Epidiolex (CBD) <ul style="list-style-type: none"> Lennox-Gastaut syndrome Dravet Syndrome Dronabinol or Marinol (THC) <ul style="list-style-type: none"> Anorexia associated weight loss with AIDS and N&V associated with chemotherapy

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CB1 & CB2 Receptor

- **CB1**
- **CB2**

CB1 Receptor:

- Most abundant GPCR in mammalian brain
- Located within the CNS along presynaptic neurons in:
 - Brain
 - Spinal cord
 - Peripheral nervous system

CB2 Receptor:

- Primarily located in immune cells and tissues



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How does cannabis interact in the body?

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Pharmies, think back to SSRI's..

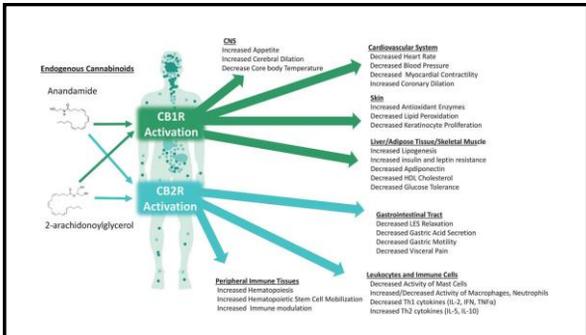
Fluoxetine

- Inhibits reuptake of serotonin
- Allows more serotonin to remain in brain for longer, thus more effect

CBD

- Inhibits reuptake of anandamide
- Allows anandamide to remain in brain longer, and produce more of its effects
 - Anandamide: based on a Sanskrit word meaning 'bliss'

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Known, Purported, and Possible Medical Benefits Associated With Cannabis Use

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Known (conclusive or substantial evidence)

- ★ Pain
- ★ Cachexia
- ★ Nausea and vomiting
- ★ Multiple sclerosis spasticity
- ★ Epilepsy (Dravet syndrome and Lennox-Gastaut syndrome)

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Possible (moderate evidence)

- Reduction in long-term use of opioids
- Opiate withdrawal
- Dystonia
- Glaucoma

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Inconclusive evidence (no RCTs)

- ❑ Alzheimer disease
- ❑ Anxiety and depression
- ❑ Antitumor effect
- ❑ Inflammatory bowel diseases (Crohn disease, ulcerative colitis)
- ❑ Heart failure
- ❑ Hepatitis C
- ❑ Ischemia/reperfusion injury
- ❑ Huntington disease
- ❑ Metabolic syndrome, obesity, diabetes mellitus
- ❑ Parkinson disease
- ❑ Sleep

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Easier access is both a blessing and a challenge.

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Cannabis Dosage Forms

- Flower
- Tinctures
- Food/Beverage
- Transdermal
- Capsules, Softgels, Tablets

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Route of Administration (By Popularity)

1. Intrapulmonary
1. Oral
1. Sublingual
1. Transdermal
1. Rectal/Vaginal

(c)

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Onset of Action, Peak, & Duration

Route	Onset Time	Peak	Duration
Inhalation	Immediately	15-30 min	2-3 hours
Sublingual	15-60	60 min	2-12 hours
Oral	30-120 min	2-3 hours	4-12 hours
Suppository	10-30 min	1-2 hours	2-8 hours
Topical <small>*includes in-gel use only</small>	15-60min	1.4 hours*	Up to 48 hours

(5)

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Dosing

- Dosing is personal.
- Rule of Thumb: Start Low, Go Slow.
- Some sources report a therapeutic effect from as little as 2.5 to 3 mg/d THC.
 - This is equivalent to about 1 puff of a joint made with 5% THC cannabis, a tiny amount.
- Prescription cannabinoid preparations recommend a starting doses between 1 to 5 mg THC
- Epidiolex up to titrate up to 25mg/kg/day CBD
- Psychoactive effects of THC begin with a 3- to 6-mg dose.
- Significant intoxication effect with a 10- to 20-mg dose.

(6)

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Drug Interactions

CYP450 Enzymes	THC Inhibits	CBD Inhibits	Common drug-drug interactions:
CYP2C9	✓	X	
CYP3A4	✓	✓	
CYP2C19	✓	✓	
CYP2D6	✓	X	

(8)

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Side Effects

CBD	THC
Somnolence	Anxiety
Decreased appetite	Dizziness
Diarrhea & other GI	Drowsiness
Transaminase elevations (AST, ALT)	Euphoria
Sleep disorder	Vasovagal collapse
	Psychosis
	Depression

(8.9)

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Future of Cannabis

- 68% of US adults support the legalization of marijuana⁽⁵⁾
- 16% of the population utilizes marijuana on a daily basis⁽³⁾

- Cannabis is a drug with expanding legal access all over the country.
- In order to better educate our community we need to be equipped with high quality information to better manage our patients' care.
- If laws continue upon their current trajectory, the education behind the science needs to grow simultaneously.

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Questions?

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References

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