Cannabis Crash Course

Feel Better Prepared For Patient Care

**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

**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. Metha
- e. All of the above

Ancient History of Cannabis

Cannabis in the Ancient World
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.

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-phlegmatics
  - 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

Cannabis in the Ancient World: Egypt

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

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.

Journey to the New World

Summary of the evolution of cannabis policy
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 Madison
- Benjamin Franklin
- Henry Clay

Pure Food & Drug Act 1906

- President Theodore Roosevelt signed the act into law in 1906.
  - Ensured accurate labeling
  - Reduced adulterated food and drugs
  - Improved public health and nutrition
  - Led to groundbreak for the ensuing prohibitionist era forward.
- 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.

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.

Marihuana Tax Act 1937

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

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 extract composed of dried cannabis flowers.
- Cannabis remained a USP listed drug for nearly a century.
- Cannabis extracts remained in the USP until USP X in 1942 after being criminalized by the 1937 Marihuana Tax Act.

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.
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).

The Shafer Commission & Nixon Rejection
- Appointed by President Richard Nixon in the early 1970s, formally known as the National Commission on Marijuana and Drug Abuse.
- It took two years for the commission to issue a report entitled "Marijuana, 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.

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.

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.

Speaker Bio & Disclosure
Co-founders of Pharmtrue & Mesilla Valley Pharmacy.

"Experimental use only: Marijuana is not FDA approved for any condition"
WHAT exactly is CANNABIS?

**Hemp vs. Marijuana**

**Hemp (Cannabis Sativa L.)**
- Delta-9 THC concentration less than > 0.3% by dry weight
- Legal after the 2018 Farm Bill
- Agricultural Commodity

**Marijuana (Cannabis Sativa L.)**
- Delta-9 THC concentration greater than > 0.3% by dry weight
- Approved for medical use in 33 states
- DEA Schedule 1 Controlled Substance

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.  

Cannabinoids

**Phytocannabinoids**
- THC & CBD most well-known
- Over 100 different phytocannabinoids in cannabis

**Endocannabinoids**
- Anandamide
  - 2-arachidonylglycerol
  - Mimic receptor interaction of THC and other phytocannabinoids

**Synthetic cannabinoids**
- Epidole (CBD)
  - Lennox-Gastaut syndrome
  - Dravet Syndrome
- Dronabinol (Marinol) (THC)
  - Anorexia associated weight loss with AIDS
  - N&V associated with chemotherapy
CB1 & CB2 Receptor

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

How does cannabis interact in the body?

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'

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

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

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

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

Easier access is both a blessing and a challenge.

Questions to Expect Regarding Cannabis

Would you recommend cannabis as an alternative to opioids?

Can I take this medication if I use cannabis?

Will I fail a drug test if I try CBD?

What is the difference between CBD & THC?

Will CBD make me “high”?

Route of Administration (By Popularity)

1. Intrapulmonary
2. Oral
3. Sublingual
4. Transdermal
5. Rectal/Vaginal

Cannabis Dosage Forms

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

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Onset of Action, Peak, & Duration

<table>
<thead>
<tr>
<th>Route</th>
<th>Onset Time</th>
<th>Peak</th>
<th>Duration</th>
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</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>Immediately</td>
<td>15-30 min</td>
<td>2-3 hours</td>
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<tr>
<td>Sublingual</td>
<td>15-60 min</td>
<td>60 min</td>
<td>2-12 hours</td>
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<tr>
<td>Oral</td>
<td>30-120 min</td>
<td>2-3 hours</td>
<td>4-12 hours</td>
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<tr>
<td>Suppository</td>
<td>10-30 min</td>
<td>1-2 hours</td>
<td>2-8 hours</td>
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<tr>
<td>Topical</td>
<td>15-60min</td>
<td>1.4 hours*</td>
<td>Up to 48 hours</td>
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*Studied in guinea pigs

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, tiny amount.
- Prescription cannabinoid preparations recommend a starting dose between 1 to 5 mg THC.
- Epilepsie 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.

Drug Interactions

<table>
<thead>
<tr>
<th>CYP450 Enzymes</th>
<th>THC inhibits</th>
<th>CBD inhibits</th>
<th>Common drug-drug interactions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CYP2C9</td>
<td>✔️</td>
<td>X</td>
<td>Warfarin</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Omeprazole</td>
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<tr>
<td>CYP2C19</td>
<td>✔️</td>
<td>✔️</td>
<td>Volproic Acid</td>
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<tr>
<td></td>
<td></td>
<td></td>
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<tr>
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<td>✔️</td>
<td>X</td>
<td>Ibuprofen</td>
</tr>
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</table>

Side Effects

- CBD
  - Somnolence
  - Decreased appetite
  - Diarrhea & other GI
  - Transaminase elevations (AST, ALT)
  - Sleep disorder

- THC
  - Anxiety
  - Dizziness
  - Drowsiness
  - Euphoria
  - Vasovagal collapse
  - Psychosis
  - Depression

Future of Cannabis
- 68% of US adults support the legalization of marijuana.
- 95% of the population uses marijuana on a daily basis.
- 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 follow current trajectories, the education behind the science needs to grow simultaneously.

Post QUIZ

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