

A New Frontier: The Evolving Legal and Policy Landscape of Medical Cannabis in Maryland: The Science

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Ancient Medicine

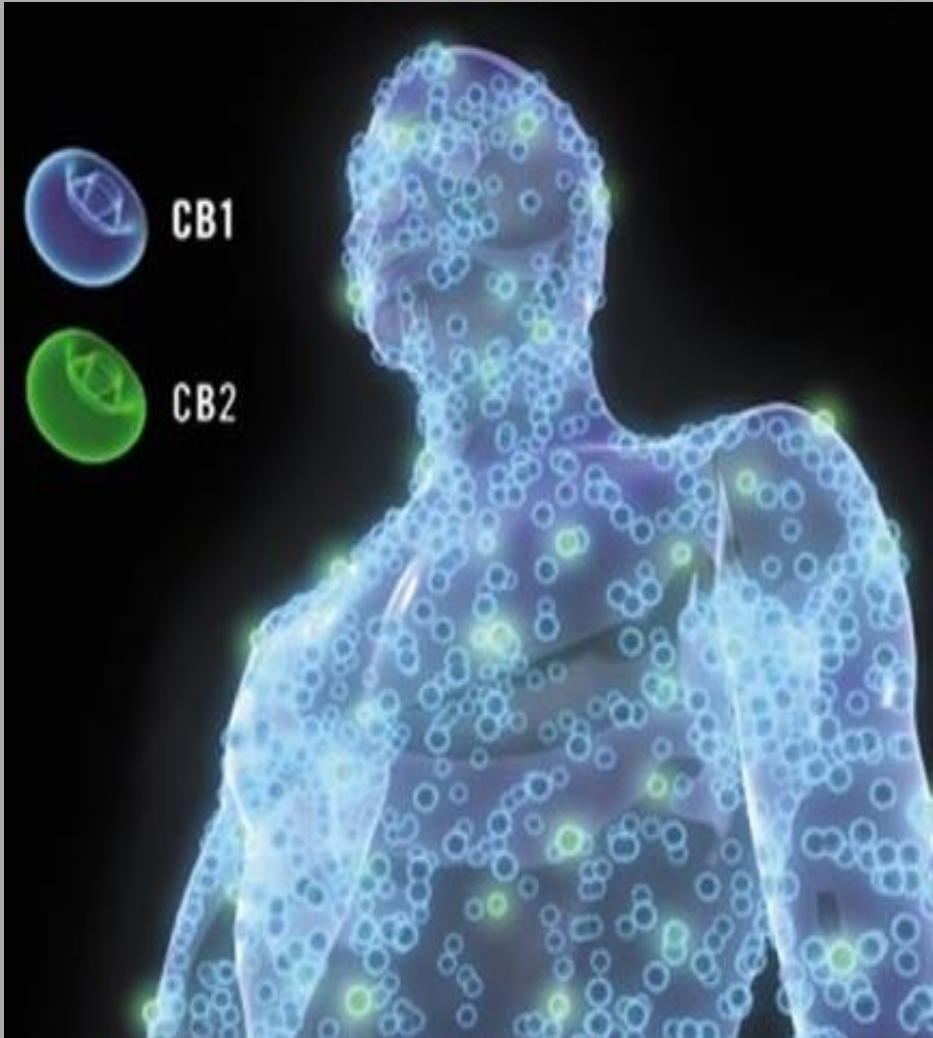
- First cultivated crop – 12,000 years
- Used as medicine – 5000 years
 - TCM – 2700 BC
 - Egyptian Papyri – 1400 BC
 - First Anesthetic – 150 AD
 - Ayurveda
 - Ancient Islamic Medicine
 - Western Medicine – 1830's
 - US Pharmacopoeia – 1857 -1942



Endocannabinoid System (ECS)

- Appetite
- Sleep
- Stress
- Emotions
- Memory
- Pain
- Fat, glucose metabolism
- Autoimmune system

Endocannabinoid System (ECS)



Receptors:

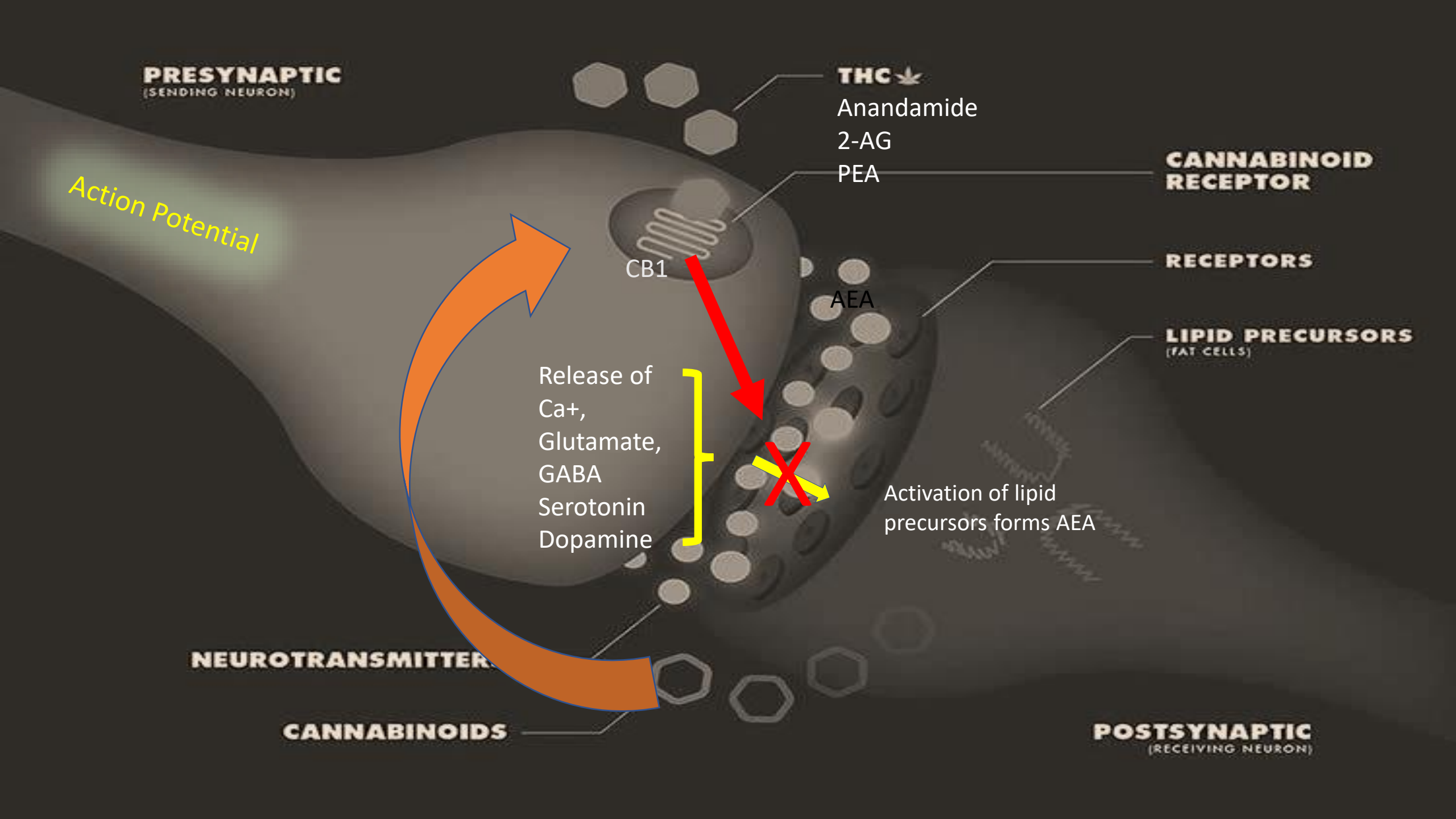
- CB1 – primarily brain, CNS
- CB2 - tissues, organs, immune cells
- Others: GPR55, TRPV, IL, TNF, 5-HT

Endocannabinoids:

- Anandamide, 2-AG, PEA
- Produced on demand
- Act locally
- Bind to transmembrane G-protein receptors principally inhibiting neurotransmitter release
- Inactivated rapidly

Enzymes:

- Fatty Acid Amide Hydrolase (FAAH)
- Monoarachylglycerol Lipase (MAGL)



Immunomodulation

- Increases interleukin I
- Decreases interleukin II
- Decreases interferon production
- Suppresses natural killer cell activity
- Increases release of pro-inflammatory cytokines
- Therefore immunomodulating, not immunosuppressing

An iceberg floating in the ocean. The tip of the iceberg is above the water line, and the much larger, submerged part is below. The sun is shining from behind the tip of the iceberg, creating a bright glow and rays of light. The sky is blue with some light clouds, and the water is a deep blue.

What we know

What we don't know due to federal
restrictions on clinical trials



indica



sativa



ruderalis



sativa



indica



ruderalis

It's All Cannabis

- Marijuana = >0.3% THC
- Hemp = <0.3% THC; fibrous
- 165 Cannabinoids
- Terpenes
- Flavonoids

What are acids?

Raw plant

- CBGA
- THCA
- CBDA
- CBCA
- THCVA



Heated plant

- CBG
- **THC**
- CBD
- CBC
- **THCV**

intoxicating

All
Phytocannabinoids
Are
Active

- THCA – anti-inflammatory; anti-tumor; pain relieving
- CBDA – anti-inflammatory; anti-tumor
- THCV – appetite suppression, intoxicating
- CBC – anti-inflammatory, anti-bacterial
- CBG – anti-inflammatory; anti-tumor; lowers IOP; appetite stimulation
- CBN - sedation

Most Studied Phytocannabinoids

THC

- Anti-inflammatory
- Analgesic
- Anti-Spasmodic
- Anti-Emetic
- Neuroprotective
- Anti-Oxidant
- Anti-proliferative
- Appetite Stimulant
- Anti-psychotic
- **Pain Distracting**
- **Antidepressant**
- **Lowers IOP**
- **Mood Elevating**
- **Slow-wave sleep**

CBD

- Anti-inflammatory
- Analgesic
- Anti-Spasmodic
- Anti-Emetic
- Neuroprotective
- Anti-Oxidant
- Anti-proliferative
- **Appetite suppressant**
- Neuropathic pain
- Anxiolytic
- **Autoimmune modulation**
- **Mood Stabilizer**
- **Anti-psychotic**
- **Gastrocytoprotective**
- **Bone growth**
- **Anticonvulsant**
- **Regulates glucose, fat metabolism**

Cannabidiol (CBD)

- Mitigates THC's
 - Intoxicating Effect
 - Effect on
 - Memory
 - Coordination
 - Balance
 - Reaction time

TERPENES

Limonene – depression, anxiety, gastric acidity

Pinene – bronchodilator, anti-inflammatory

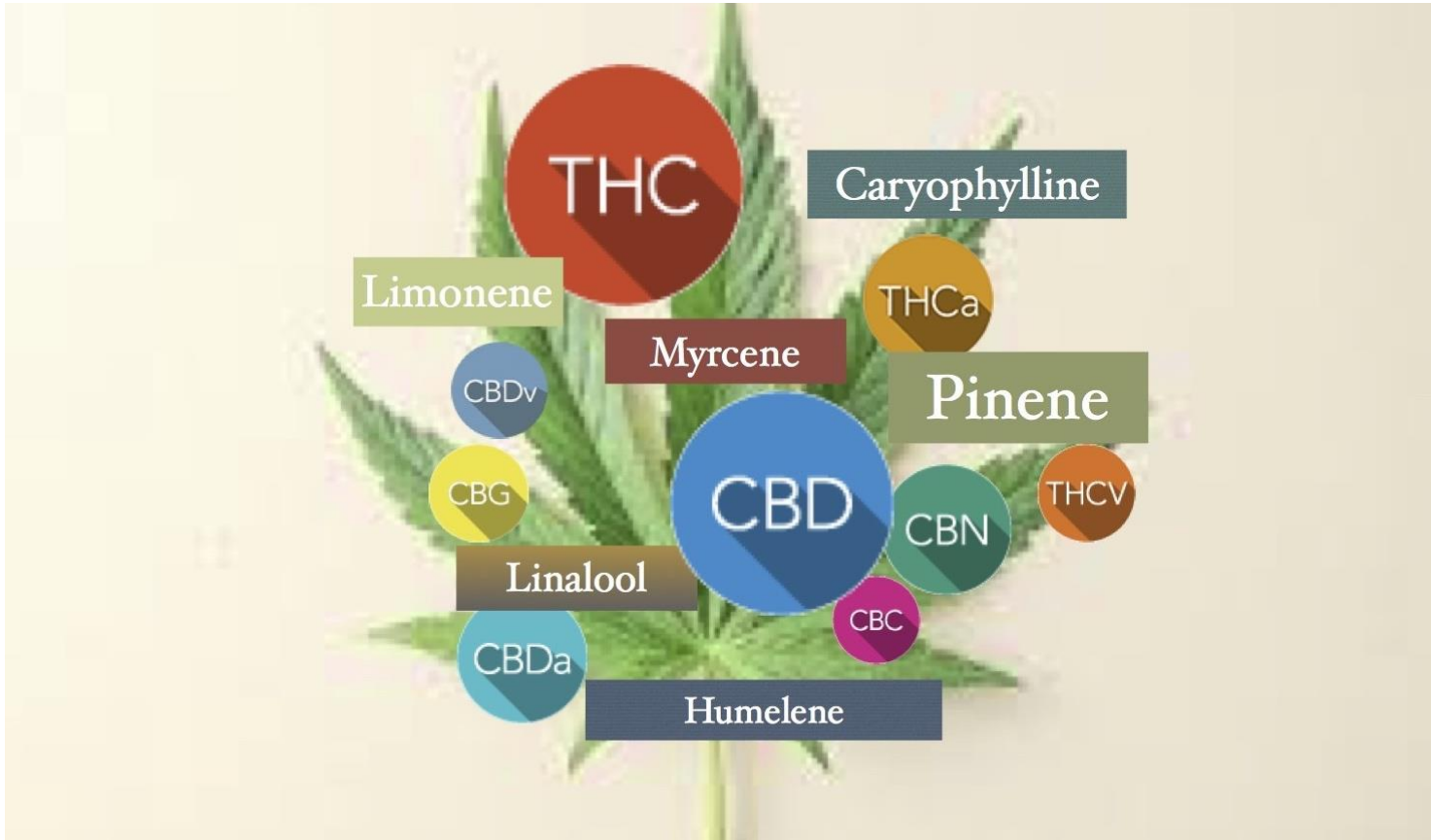
Humulene – anti-inflammatory

β -caryophyllene - analgesic, anti-spasmodic

Myrcene – sedation, anti-inflammatory

Linalool – anxiolytic, sedation, anticonvulsant





“Cannabinoids, terpenes, and flavonoids work together in an entourage such that the medicinal impact of the whole plant is greater than the sum of its individual parts.”

- Ben-Shabat, Mechoulam 1998

Entourage effect



Chronic Pain

- Osteoarthritis
- Tendonitis
- Ehlers-Danlos
- Chronic Regional Pain Syndrome
- Degenerative Disc Disease
- Migraines
- Neuropathy
- Carpal tunnel
- Dysmenorrhea
- Tendonitis

Autoimmune

- Lupus
- Myasthenia gravis
- Rheumatoid &
- Psoriatic arthritis

- Fibromyalgia
- Mixed Connective Tissue Disease
- Interstitial cystitis
- Hashimoto's

Mental Health

- Anxiety
- Depression
- Mood disorder
- Schizophrenia
- Stress
- Insomnia
- PTSD

Neurological

- Muscle sclerosis
- Seizures
- Parkinson's

- Huntington's
- Tourette's
- Autism
- Cerebral palsy

Metabolic

- Obesity
- Diabetes
- Hyperlipidemia

Other

- Glaucoma
- Macular degeneration
- Opioid Use Disorder
- Crohn's
- Ulcerative colitis
- Irritable Bowel

ADVERSE EFFECTS

- Anxiety/paranoia
- Tachycardia
- Lowered blood pressure
- Confusion
- Poor balance/coordination
- Neurodevelopmental
- Memory/Cognition
- Cannabinoid Hyperemesis Syndrome
- Psychological dependence/addiction (9%)
- No LETHAL dose

Special Considerations



Pediatrics

Neurodevelopment
Seizures



Geriatrics

Sensitive to THC
Fall risks
Mental confusion



Cannabis Naïve

No tolerance
Respond to lower
levels of THC



Use Disorder

High CBD

Cannabinoid Profiles CBD:THC

20:1- 2:1

- Pain
- Muscle spasm
- Inflammation
- Neuropathy
- Anxiety
- Alleviates
- No intoxicating effect

10:1-1:1

- Pain
- Muscle spasm
- Inflammation
- Neuropathy
- Anxiety
- Depression
- Minimal to no intoxication

1:1 -1:20

- Pain
- Muscle spasm
- Inflammation
- Neuropathy
- Glaucoma
- Parkinson's
- Intoxicating

Cannabis and Pain

- Cannabis **increases the pain relieving effects of opioids** without increasing risk of respiratory depression
- CBD quells cravings for opioids, alcohol, benzodiazepines, and nicotine
- Patients can **reduce opioid doses by 50-75%** and experience equal or better pain relief via crosstalk between opioid and cannabinoid receptors
- Cannabis has been found to relieve both **inflammatory and neuropathic pain**
- Cannabis addresses comorbidities of chronic pain: **anxiety, depression, muscle spasm, and insomnia**
- Cannabis alleviates symptoms of opioid withdrawal: pain, muscle spasm, nausea/vomiting, anxiety, insomnia, anorexia, and cravings

Modes of Administration



Inhalation



Sublingual/Oromucosal



Oral



Topical



Transdermal

DOSING



Start low, go slow

Less is more



Wide variation in individual patient's response to cannabis



Takes time to titrate the right dose; find the right ratios, and strains

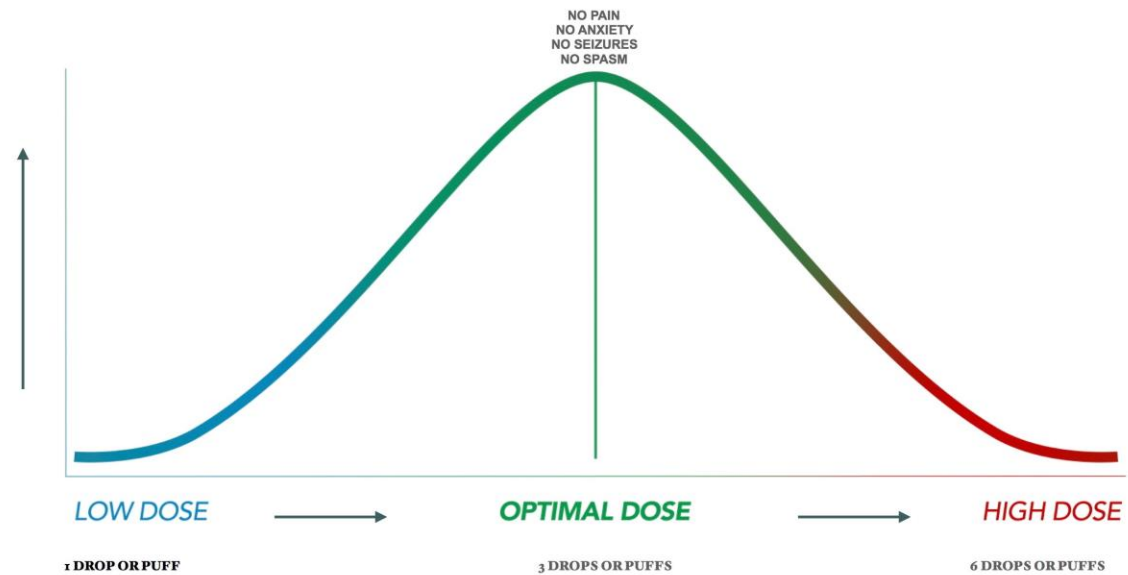


Start with 1-2 drops or puffs and increase gradually:

1 puff q 10 – 15 mins
(Inhalation)

1 drop q 20 – 30 mins
(sublingual)

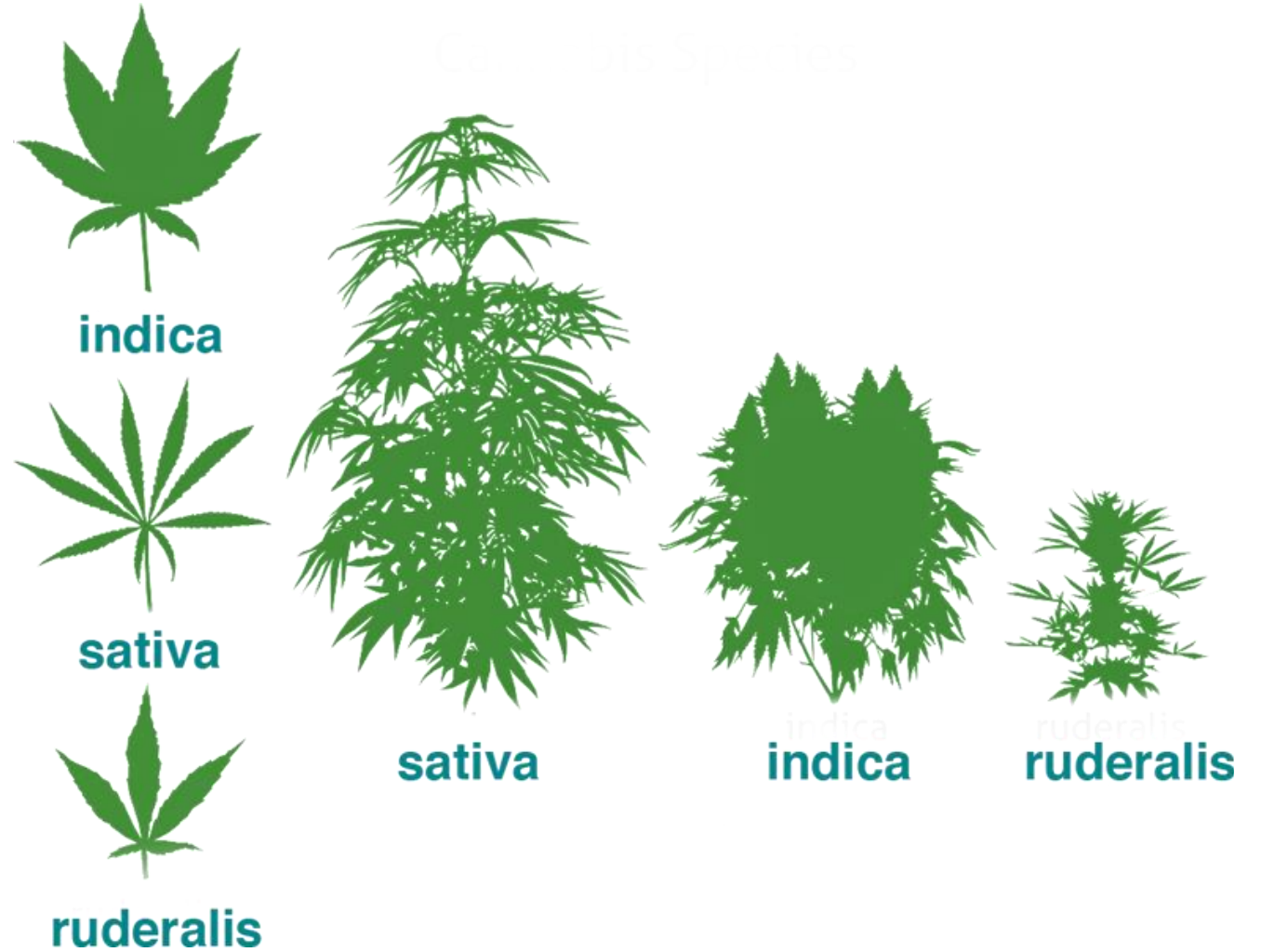
Biphasic Effect



- Too little or too much
- Decreases efficacy

CBD: Marijuana vs Hemp

- CBD is CBD is CBD
- Terpene profile usually higher in dispensary medicine





Cannabis: Nature's Cleaner

- Cannabis absorbs contaminants from the soil, air, and water
- Can be used to clean toxic fields (China)
- Heavy metals: lead, mercury, arsenic, cadmium

Hemp: Unregulated Industry

- Inaccurate labeling
- Contaminants
 - Heavy metals
 - Pesticides
 - Solvents
 - Bacteria/mold/aflotoxin

Medicine by Zip Code

- 33 states and DC with medical program; additional 14 with CBD/low THC; CBD still illegal in Idaho, Nebraska, South Dakota
- New York – insurance covers provider office visits; prohibits pre-employment testing for THC-COOH
- New Mexico – children can receive medication at school; will not impact transplantation eligibility

Federal Status: Schedule I = no medical benefit and high risk of abuse

- 2018 Farm Bill legalized hemp at federal level
- 2018 CBD FDA approved for seizures (Epidiolex)
- 1986 THC FDA approved for nausea, vomiting, anorexia (Marinol)
- THC and CBD and all non-intoxicating cannabinoids in plant still illegal

NO JOB PROTECTION

NO HOUSING PROTECTION

CHILDREN UNABLE TO BE MEDICATED AT SCHOOL

MEDICATION NOT COVERED BY INSURANCE

IMPEDES RESEARCH AND CLINICAL TRIALS

Thank You!

Ann Marie

Patricia

