

Presented to the House Commerce & Gaming Committee.
April 1, 2019

Cannabidiol (CBD): A scientific overview

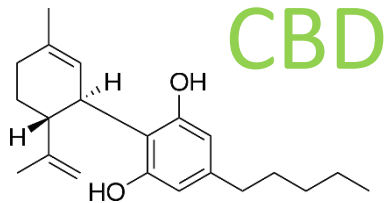
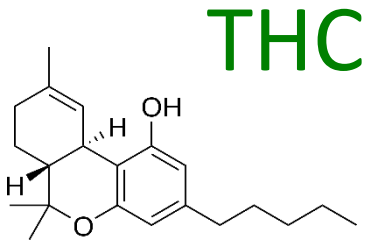
Beatriz H. Carlini: Senior Research Scientist- Alcohol and Drug Abuse Institute

Nephi Stella: Professor – School of Medicine

Co-Directors – Center for Cannabis Research (UW-CCR)

Cannabis / Hemp plants & cannabinoids

A



THC

B

Psychoactive - Enhances Sensory Awareness

Medical: Analgesic/Appetite

Side effects: Impact Brain Development

Side effects: "High" not always wanted

CBD

C

No "high" / "Tames" THC properties

Medical: Anti-epileptic

Medical: Anti-inflammatory

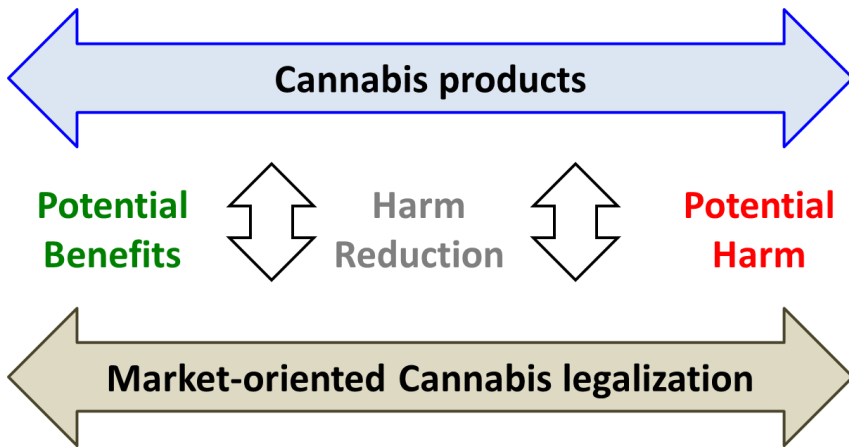
Side effects: Promising Safety Profile

Practice *versus* Evidence

Impact occurs along a continuum

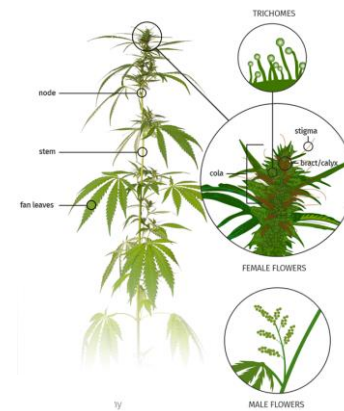
A

Practice based



B

Evidence based



Learn from Practice and Use
To Optimize Evidence-based Use





Multimodal Platform

Create affinity group to promote innovative cannabis research

2016: Establish Foundation

- Identify CB researchers (~50)
- Start forging UW-CCR concept

2017: Establish Leadership

- Outline mission
- Implementation of UW-CCR: Sept 13, 2017

2018: First undertakings

- Board of Directors
- First UW-CCR retreat

Practice *versus* Evidence

Production

Biology

Problem:

- Little Cannabis/Hemp strains information
- Little cannabis/Hemp chemotype information
- Few cultivation methods

Solution:

- Establish genetic and chemotype biology of plant
- Establish optimized growing practices targeted to specific products



Occupational & Environmental Health

Problem:

- Workers exposed to occupational hazards that are under-appreciated and unique (e.g. individuals could develop asthma)

Solution:

- Quantify workplace hazards
- Determine association with health outcome
- Develop solutions to protect workers



Practice *versus* Evidence

Health Impact

Medicine

Problem:

- Many debilitating diseases remain without therapy.
- Many currently-available therapies are associated with side-effects.

Solution:

- Investigate therapeutic potential of cannabinoids (THC/CBD) in most promising indications.
- Establish toxicity profile of cannabinoids (THC/CBD).



Society and Health

Problem:

- Vulnerable population are at higher risk for negative health and social impact resulting from use

Solution:

- Inform policy, treatment and public health about THC/CBD
- Research products of high potency
- Establish impact on youth, pregnant women, older adults and people struggling with illnesses



Practice *versus* Evidence Prevention

Professionals and Parents

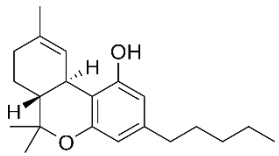
Problem:

- Prevention professionals and parents want to know how to best communicate with children and teens about the legal use of cannabis

Solution:

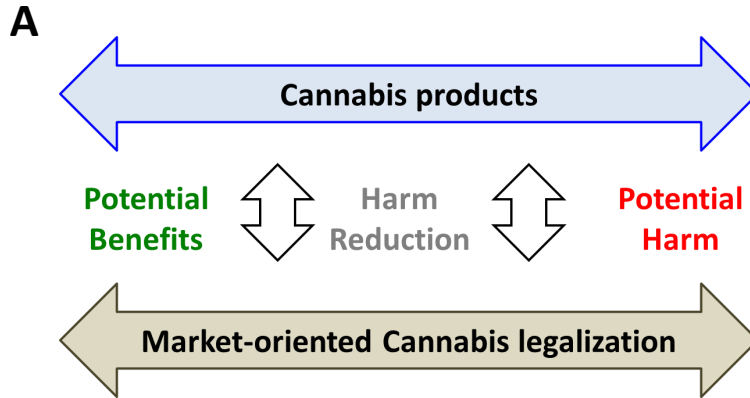
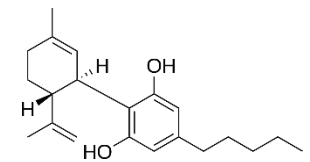
- Develop and test prevention interventions for youth and young adults
- Help and educate prevention professionals and parents



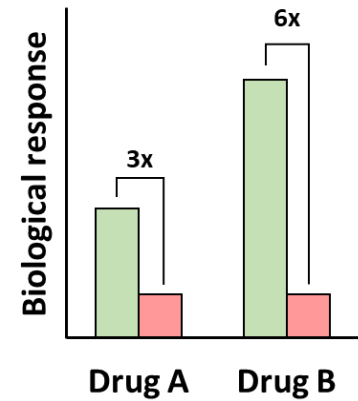


THC versus CBD

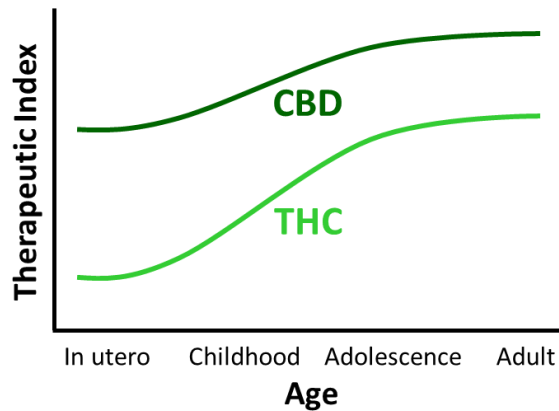
benefit – harm reduction – harm



B Therapeutic Index



C Dynamic Therapeutic Index



D Route – Frequency - Duration

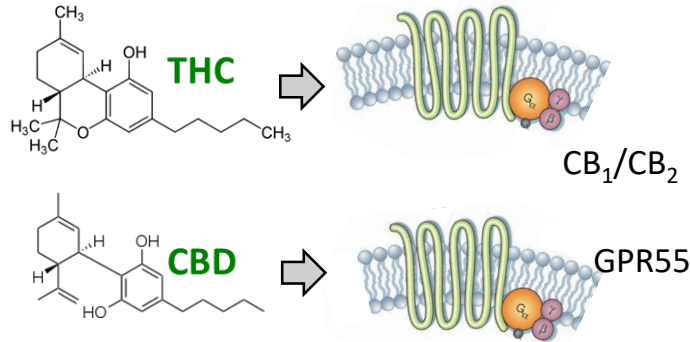


Therapeutic Index:
The Art of Healing without Harming

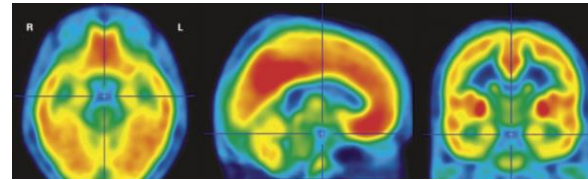
THC versus CBD

Molecular – Human Physiology

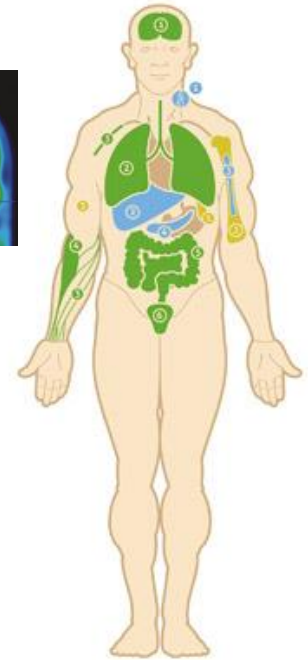
A Cannabinoid receptors



B



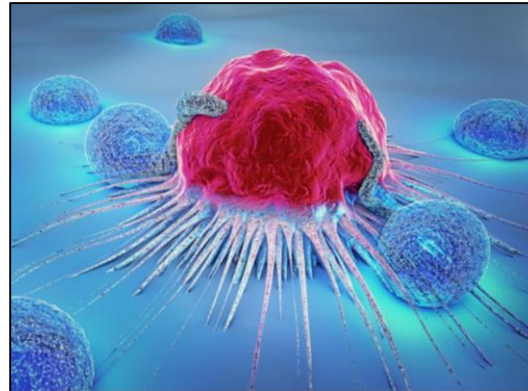
Different Expression throughout the body



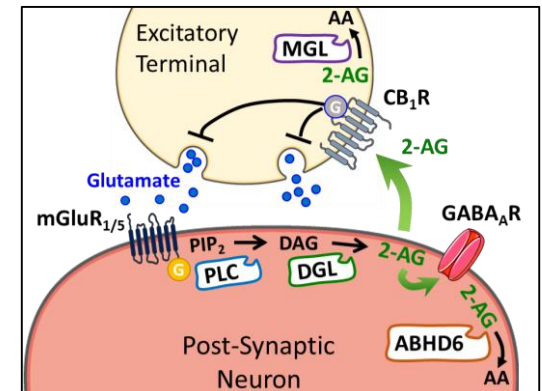
C Action on neurons



D Action on immune cells



E Endocannabinoids



THC *versus* CBD

Potential Harm

THC/CBD use by young adults

- Cannabis: Widely used “illegal” drug (i.e. Age 21)
- Cannabinoid receptors and endocannabinoids are involved in **brain development** and setting up **neuronal connections**
- Increasing evidence that THC use during adolescence may increase risk of psychiatric disorders.
- Establish effect of THC/CBD use during adolescence on cognitive function and brain development?



► **Research:** Implement policies, educate and discourage use by vulnerable populations

THC *versus* CBD

Harm Reduction

THC/CBD use to combat opioid epidemic

- Initial scientific evidence that cannabinoids may be used to replace some medical properties of opioids (e.g. pain reduction/analgesia).
- Patients develop addiction to opioids/heroin.
- Caveats related to data/research designs used to understand if substitution really happens in the real world.



▶ **Research:** Determine if cannabinoids can substitute opioids

THC *versus* CBD

Potential Benefit

THC/CBD use to treat epilepsies

- Initial scientific evidence that cannabinoids (THC and then CBD) may reduce seizures in preclinical models of epilepsies.
- Standard of care anti-seizure drugs are palliative treatment and induce debilitating side effects and patients develop resistance.
- Initial anti-epileptic evidence of CBD in select young patients with intractable seizures, human clinical trials and FDA approval.



▶ **Research:** Determine if CBD can be optimized and treat other types of epilepsies

CBD

Moving Forward

Take Home Message

- Develop evidence-based knowledge of the potential harm – harm reduction – potential benefit of THC and CBD.
- Use this knowledge to guide policy and regulations.
- Foster innovative research on CBD production and CBD-based products.

CBD in Washington State

Topics

- CBD- What is available in WA?
- Health Benefits: CBD potential as medicine
- Public Health challenges of products available in WA
 - Effectiveness Uncertainty
 - Labelling Accuracy
 - Quality control
 - Vulnerable populations

What is available in WA ?



- Source: Cannabis plant
- FDA approved and regulated (June 2018)
Available under prescription
 - Available for research
NIH regulated and DEA compliant



- Source: Cannabis plant
- Produced in WA State or obtained out of state
- Regulated by WS LCB, DOH
- Available in cannabis retail stores

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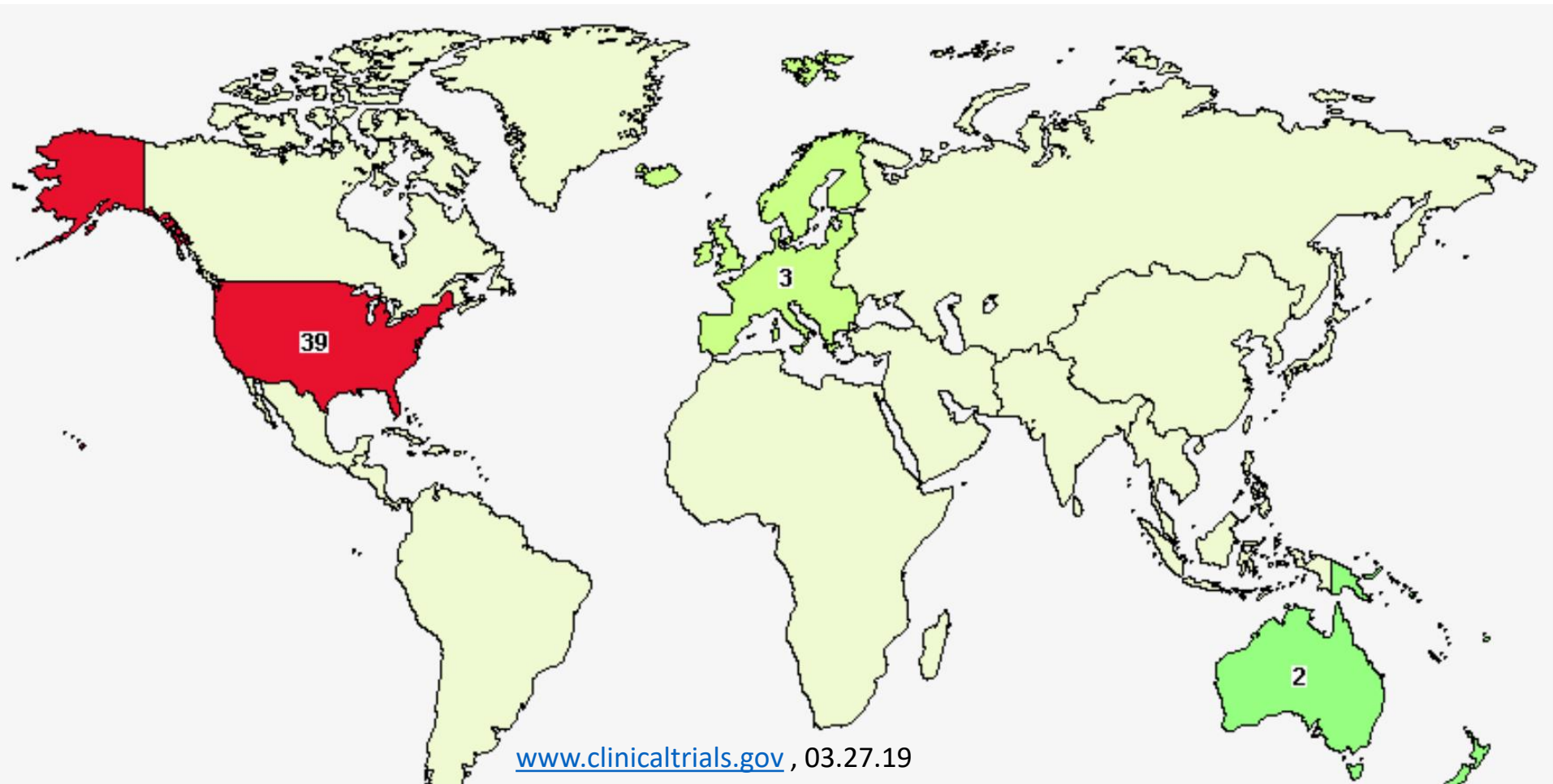
- Source: Cannabis plant
- Produced in WA State (or obtained out of state)
- Regulated by WS LCB, DOH
- Available in cannabis retail stores



- Source: Hemp
- Produced outside WA State (CA, CO, NY)
- Regulated as a wellness product/ dietary supplement
- Available ... everywhere

Health Benefits: CBD potential as medicine

ACTIVE Clinical trials with Cannabidiol



CBD potential as medicine



- > Alcohol Use Disorders and PTSD
- > Early Psychosis
- > Anxiety Disorders
- > Reduction of Chronic Inflammatory Back Pain
- > Motor Symptoms of Parkinsons' Disease
- > Multiple Myeloma, Glioblastoma and GI Malignancies
- > Prader-Willi syndrome
- > Infantile Spams
- > Brain Injury recovery
- > Rett Syndrome
- > Fragile X



Public Health challenges



Effectiveness uncertainty



Hemp Oil for Pain Relief 250mg - Stress Support, Anti Anxiety, Sleep Supplements - Herbal Drops - Rich in MCT Fatty Acids - Natural Anti Inflammatory - 1 Fl Oz (30 ml)

★★★★★ 9

\$18⁹⁹ ✓prime

About the product

- Hemp oil drops are finally here. This natural supplement is perfect for use everyday. May help with inflammation, stress, pain management, and more!
- Each serving (30 drops) contains 8.33mg of our high quality, premium hemp oil supplement. It comes in a great peppermint flavor, which makes taking your daily dose easier than ever.
- Our hemp oil is loaded with Omega 3 & 6 fatty acids -- which are good for you! Promotes overall health and wellness when combined with a regular workout routine and diet.



Effectiveness uncertainty



“I’m too compassionate to sell people things they don’t need. We have a topical that’s \$68.00 and it’s menthol and arnica and some CBD oil, so it’s sold to arthritic patients, who are usually much older

They’re like, “oh, it feels so great” and I’m just thinking “yeah, it’s tiger balm and it’s reducing your bruising because it’s got arnica in it.” ()*

(*) Focus group participant in the I-502 sponsored study

"Budtenders" as Harm Reduction Agents: A Study among Cannabis Retail workers in Washington State

Labelling Accuracy

- > Less CBD than claimed
- > More CBD than claimed
- > THC enough to feel effects



Research Letter

November 7, 2017

Labeling Accuracy of Cannabidiol Extracts Sold Online

Marcel O. Bonn-Miller, PhD¹; Mallory J. E. Loflin, PhD²; Brian F. Thomas, PhD³; et al

[Author Affiliations](#) | [Article Information](#)

JAMA. 2017;318(17):1708-1709. doi:10.1001/jama.2017.11909

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PEDIATRIC NEUROLOGY BRIEFS

2018

ANTIPILEPTIC MEDICATIONS

Inadequate Regulation Contributes to Mislabeled Online Cannabidiol Products

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Related Article: Bonn-Miller MO, Loflin MJ, Thomas BF, Marcu JP, Hyke T, Vandrey R. Labeling Accuracy of Cannabidiol Extracts Sold Online. *JAMA*. 2017 Nov;318(17):1708-9.

Keywords: Cannabidiol; Medical Marijuana; Pediatric Neurology

Quality Control:

No requirement to report

- > Pesticides
- > Contaminants
- > Residues



Vulnerable populations



Financial Burden

Health burden – immune compromised individuals

May discourage use of CBD-based medicines

Hemp out of state = less excise taxes for social services

No rules on advertisement - youth

Moving forward

UW CCR

- Develop science based public education
- Assess public perception of CBD to guide policy and regulations
- Foster research on CBD medical potential
- Forster research on possible impact of widely available unregulated CBD products

Thanks!

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