

Presented to the House Commerce & Gaming Committee.  
September 12<sup>th</sup>, 2019

# Marijuana-Related Research in Washington State: An Update from the University of Washington

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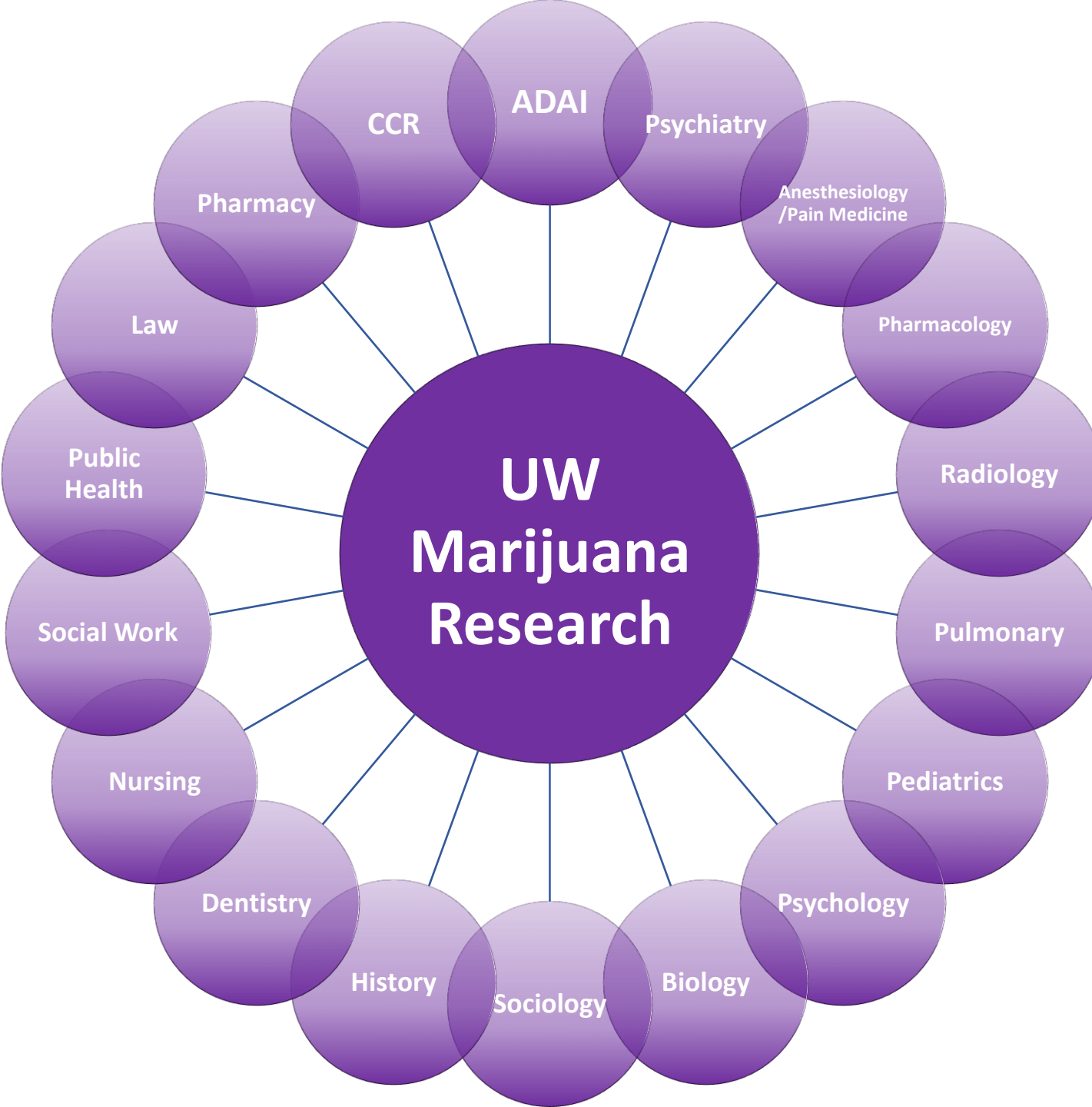
**Nephi Stella:** Professor – School of Medicine

**Susan Ferguson:** Associate Professor – School of Medicine

Director - Alcohol and Drug Abuse Institute

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

Affiliate Associate Professor - School of Public Health



22

I-502 Funded  
Projects since 2015  
(via ADAI)

13

Federally Funded  
Projects

**Goal:**

Create and disseminate knowledge to scientists, the health services workforce, legislators and the community.



## Research Updates:

1. Marijuana use and pregnancy
2. Preventing initiation and hazardous use
3. Pain management
4. Effects on the lung immune system

# Marijuana use and pregnancy

## **Funded by I-502 Dedicated Funds**

- Pregnant and parenting women who use substances

## **Funded by NIH**

- Moms and Marijuana Study



# Pregnant and parenting women who use substances

Among mothers still using substances after a 3-year intervention program (PCAP):

- Cannabis use increased after legalization
- No substitution effect

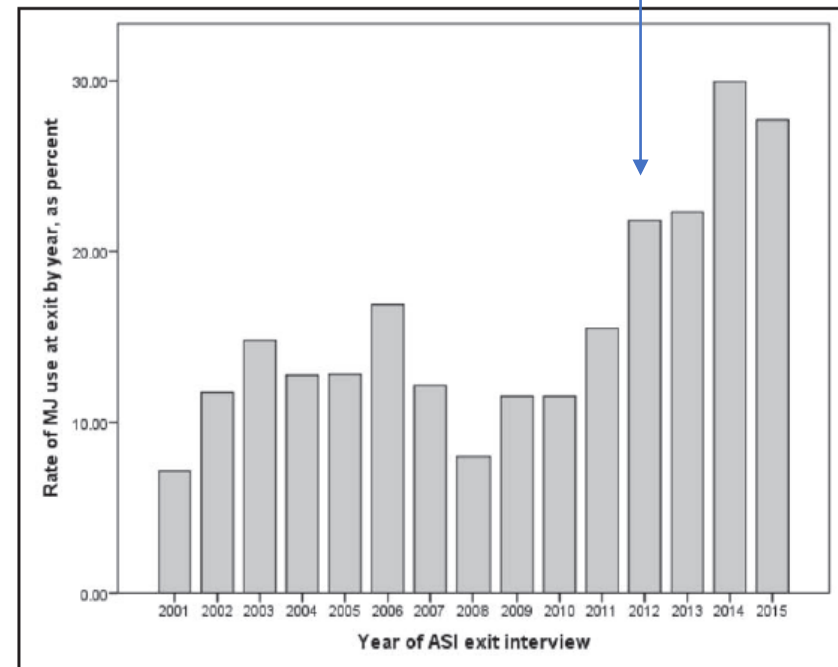
## Use of Marijuana and Other Substances Among Pregnant and Parenting Women With Substance Use Disorders: Changes in Washington State After Marijuana Legalization

THERESE M. GRANT, PH.D.,<sup>a,\*</sup> J. CHRISTOPHER GRAHAM, PH.D.,<sup>b</sup> BEATRIZ H. CARLINI, PH.D., M.P.H.,<sup>b</sup>  
CARA C. ERNST, M.A.,<sup>b</sup> & NATALIE NOVICK BROWN, PH.D.<sup>a</sup>

<sup>a</sup>Department of Psychiatry and Behavioral Sciences, University of Washington School of Medicine, Seattle, Washington

<sup>b</sup>Alcohol and Drug Abuse Institute, University of Washington Health Sciences Administration, Seattle, Washington

Marijuana legalized



Project lead: Dr. Therese Grant, ADAI-FADU, Psychiatry

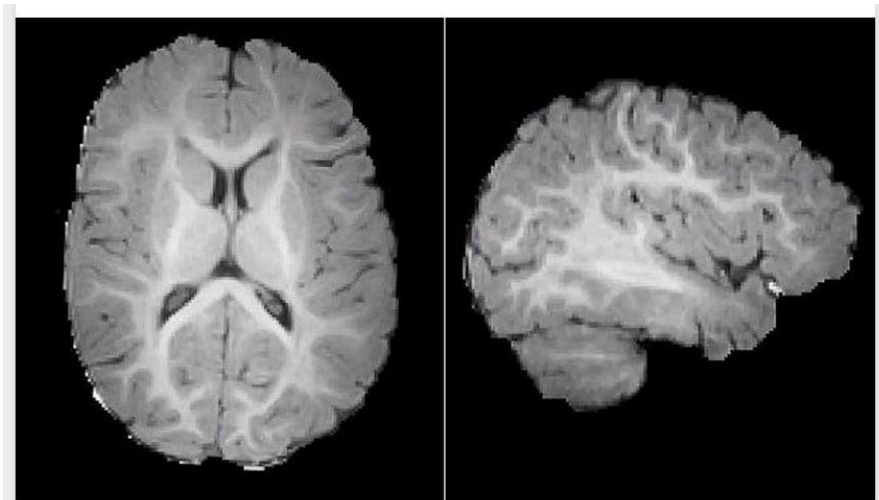
Funded by I-502 Dedicated Funds

Next Steps: Develop and test programs for high-risk moms

# Moms and Marijuana Study

## How does marijuana use during pregnancy impact infant development?

- Investigate 6 month-old infants exposed to cannabis *in utero*:
  - Behavioral assays
  - Brain Imaging: Functional, structural, chemical
- 20 participants in 1<sup>st</sup> trimester have been recruited to date
- Prospective study highly innovative
  - Daily use for 2<sup>nd</sup>/3<sup>rd</sup> trimesters



MRI scans (Photo credit: Kleinhans Lab)

Project lead: Dr. Natalia Kleinhans, Radiology

Funded by NIH

Project status: Imaging to start June, 2020

# Preventing initiation or hazardous use

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## Funded by NIH

- Strengthening families
- Teen Marijuana Check Up

## Funded by I-502 Dedicated Funds

- Budtenders' potential to educate consumers



# Strengthening families



## Feasibility of *Connecting*, a Substance-Abuse Prevention Program for Foster Teens and their Caregivers

**Kevin P. Haggerty** University of Washington

**Susan E. Barkan** University of Washington

**Martie L. Skinner** University of Washington

**W. Ben Packard** Washington State Department of Social and Health Services, Division of Children and Family Services

**Janice J. Cole** University of Washington

Prevention Science (2019) 20:894–903  
<https://doi.org/10.1007/s11121-019-01018-0>

## Effectiveness of Facebook Groups to Boost Participation in a Parenting Intervention

Marina Epstein<sup>1</sup> · Sabrina Oesterle<sup>1</sup> · Kevin P. Haggerty<sup>1</sup>

Published online: 23 May 2019  
© Society for Prevention Research 2019

### Abstract

Although family-based prevention programs have been shown to be effective at reducing adolescent substance use, it is often difficult and costly to recruit and retain parents in programs administered in person. The current study tested whether program engagement and parenting practices could be improved by offering parents in a self-directed family program access to a private Facebook group. Parents of middle school children ( $N = 103$ ) were recruited through paid Facebook ads to a 5-week self-directed teen substance use prevention program to be completed at home together by parents and their children. Two thirds of parents ( $N = 72$ ) were randomly assigned to a moderated private Facebook group that provided a forum for parents in the study to interact with each other, and one third ( $N = 31$ ) were randomized to use the intervention materials without additional support. Relatively few parents participated in the Facebook group and most did not find the experience useful. However, satisfaction with the program assessed 3 months after program completion was high among all parents and most parents engaged with the materials, irrespective of Facebook group assignment. Overall, parents reported significantly lower conflict and more household rules 6 months post-intervention compared to baseline. Parenting practices did not change more among those assigned to the Facebook group than among parents who used the materials on their own. The current findings suggest that providing opportunities for parents to interact online while participating in a self-directed family intervention may not help to increase engagement or improvements in parenting practices, particularly when few parents engage with each other.



Project leads: Dr. Kevin Haggerty, Dr. Jen Bailey, Dr. Sabrina Oesterle, SDRG-Social Work  
Funded by NIH  
Project status: Concluded



# Teen Marijuana Check-up (TMCU) Implementation

Can a TMCU intervention be effective in the real-world?

- Goal: Reach regular users not seeking treatment
- Advertised as a “check-up”
  - Brief (2 session) program
  - No parental consent needed
- Outcome: Reduce marijuana use and its consequences
- Also examine the degree of training/oversight necessary for successful implementation of treatment
- Intervention identified by Washington State Institute for Public Policy (WSIPP) as an “evidence-based practice”

Project leads: Dr. Denise Walker - School of Social Work, Dr. Bryan Hartzler - ADAI

Funded by NIH

Project status: Ongoing, trial testing strategies in 7 Western Washington Public High Schools

# Budtenders' potential to educate consumers

Budtenders are trusted source, direct contact with legal consumers

- Study: 5 focus groups with budtenders in King County
- Findings: Budtenders *are willing* to educate consumers
  - To avoid negative experiences from high potency cannabis
  - On cannabis testing, pesticides and other contaminants
  - To keep minors far from their businesses
- Budtenders *are not* comfortable talking about driving under the influence or use during pregnancy

Project lead: Dr. Beatriz Carlini – ADAI

Funded by I-502 Dedicated Funds

Next Steps: Public health education for Budtenders

# Marijuana and pain management



Cold  
Spring  
Harbor  
Laboratory

bioRxiv

THE PREPRINT SERVER FOR BIOLOGY

## **Orally consumed cannabinoids provide long-lasting relief of allodynia in a mouse model of chronic neuropathic pain**

Edward J.Y. Leung, Antony D. Abraham, Brenden A. Wong, Lauren C. Kruse, Jeremy J. Clark, Benjamin B. Land

**doi:** <https://doi.org/10.1101/556373>

- Short-term: THC, CBD and morphine reduce chronic pain
- Long-term: THC and CBD remain effective, morphine shows tolerance
- THC and CBD viable alternative to opioids for pain management
  - Especially important in light of opioid epidemic

Project lead: Dr. Benjamin Land – Pharmacology

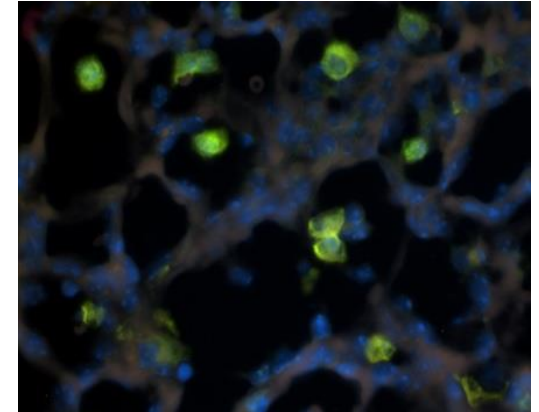
Funded by I-502 Dedicated Funds and Scan Foundation

Next Steps: Examine molecular basis for cannabinoid-opioid interactions

# Marijuana and lung immune system

How does marijuana smoke exposure alter the immune function of the lung to respiratory viruses, such as flu?

- Uses mouse model to study effects of smoke inhalation.
- Highlights how marijuana use can have effects on general health.



Cannabinoid 1 receptors in mouse lung tissue. Image courtesy of Dr. Altemeier.

## Oregon vaping death investigation centers on marijuana oil purchased from 2 stores

Updated Sep 07, 3:24 PM; Posted Sep 05, 7:33 PM Updated Sep 07, 2019; Posted Sep 05, 2019

Project lead: Dr. William Altemeier— Pulmonary  
Funded by NIH  
Project status: On-going

## The New York Times

Updated: Friday, September 6, 2019 at 10:15 AM

*The number of possible cases of vaping-related lung illness in the U.S. has more than doubled to 450, including three deaths, health officials said.*

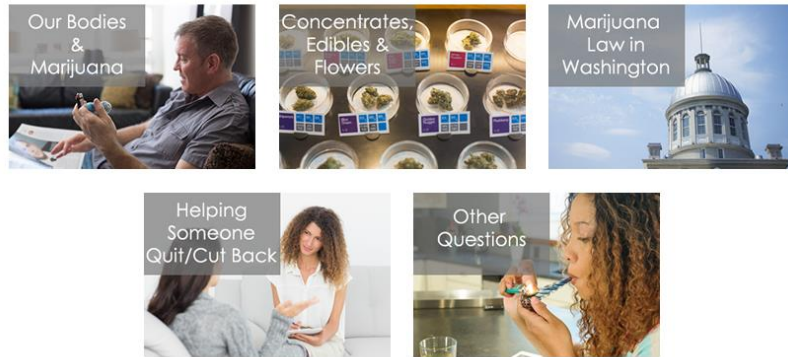
**Breaking Just Now**

# Disseminate Knowledge

## Learn About Marijuana E-Learning Modules

These short, interactive modules answer **frequently asked questions** on topics related to marijuana.

Learn about the **endocannabinoid system** (*Our Bodies & Marijuana*), **different products and methods of use** (*Concentrates, Edibles & Flowers*), **current state law** (*Marijuana Law in Washington*), **information for "helping" professionals and friends/parents/family members** (*Helping Someone Quit/Cut Back*), and **anxiety, drug testing at work, cannabis hyperemesis syndrome, and more** (*Other Questions*).



## Symposium on Marijuana Research in Washington

"A UW and WSU Joint Effort"

The University of Washington Alcohol & Drug Abuse Institute hosted its 3rd symposium on marijuana research on Friday, May 18, 2018 in partnership with researchers at Washington State University. The symposium featured Attorney General for Washington State Bob Ferguson, plus researchers from both universities who explored new and persistent issues within the changing landscape of legal marijuana:

- **Marijuana and Vulnerable Populations**
- **Cannabinoids: Therapeutic Potential**
- **Marijuana Use & Other Substances: Substitution, Combination, or Both?**

### Morning Session

**Symposium Opening Remarks**  
 Dennis Donovan, PhD [start video here]  
 Director, Alcohol & Drug Abuse Institute, University of Washington

**Keynote Address**  
 Bob Ferguson [start video here]  
 Attorney General for Washington State

**Updates on UW and WSU Marijuana Research Activity**  
 Michael McDonell, PhD, Washington State University [start video here]  
 Beatriz Carlini, PhD, MPH, University of Washington [start video here]

## Learn About Marijuana

Science-based information for the public

ADAI ALCOHOL & DRUG ABUSE INSTITUTE UNIVERSITY OF WASHINGTON

Home Factsheets Parents Teens Español Policy & Law Research Adult Consumers Get Help

### Marijuana and Prescribed Medications

**Marijuana and Prescribed Medications**  
 Many people who use marijuana also take prescription medications for a variety of reasons, such as mental health concerns, chronic medical conditions, or acute illnesses. This is especially true of older adult marijuana users since older adults often take several prescription medications on a daily basis. People sometimes assume that marijuana is totally safe because it is a plant that has been used throughout history. This is not necessarily true. Plants can sometimes be dangerous. For people who take prescription medications and also use marijuana, it's important to realize that, even though marijuana is a plant, it has biological effects just like any other drug or medication. Due to its chemical properties, marijuana can interact with a number of other drugs or medications.

**Basic Facts about Marijuana**  
 More than 500 chemicals have been identified in the chemical makeup of marijuana. More than 100 of these belong to a family of chemicals called "cannabinoids." The most well-known cannabinoids are delta-9-tetrahydrocannabinol (THC) and cannabidiol (CBD). THC is the cannabinoid that we think is most responsible for the "high" people get when using marijuana. CBD does not make people high. CBD actually dampens the high caused by THC. Both THC and CBD are reputed to have certain health benefits.

## Biennial MARIJUANA RESEARCH REPORT 2017-2019

University of Washington Alcohol & Drug Abuse Institute

The Alcohol & Drug Abuse Institute (ADAI), a multidisciplinary research center at the University of Washington's Health Sciences Administration, has been the recipient of the **Washington State Dedicated Marijuana Fund for research at the University of Washington** since July 2015.

This report presents the activities and products developed by ADAI with support from the Dedicated Marijuana Fund during the 2017-2019 Biennium.

UNIVERSITY of WASHINGTON June 2018

## Marijuana and Sexual Risk Behavior in Youth and Emerging Adults: What Do We Know?

ADAI ALCOHOL & DRUG ABUSE INSTITUTE

Susan A. Stoner, PhD, Research Consultant

### Introduction

In general, substance use has long been understood to increase sexual risk behavior, which may result in sexually transmitted infection or unintended pregnancy. In particular, a large and complex body of research shows alcohol use in the context of dating increases the likelihood of sex and decreases the likelihood of condom use. But what do we know about marijuana use and sexual risk behavior in youth and emerging adults?

### Marijuana Use is Prevalent Among Youth and Emerging Adults

Use of marijuana is prevalent among youth and emerging adults. According to an annual, longitudinal, nationally representative survey of American youth called Monitoring the Future, in 2016, past month use of marijuana was reported by 5% of 8<sup>th</sup> graders, 14% of 10<sup>th</sup> graders, and 23% of 12<sup>th</sup> graders.<sup>1</sup> Past month use rates in Washington State in 2016 reported via the Healthy Youth Survey were slightly higher than national rates, coming in at 6% of 8<sup>th</sup> graders, 17% of 10<sup>th</sup> graders, and 26% of 12<sup>th</sup> graders.<sup>2</sup> In Washington State, marijuana use increased significantly between 2006 and 2016 among 12<sup>th</sup> graders but has not increased for other grades over the same time frame.

Year	8th graders	10th graders	12th graders
2006	~2%	~10%	~18%
2008	~2%	~10%	~18%
2010	~2%	~10%	~18%
2012	~2%	~10%	~18%
2014	~2%	~10%	~18%
2016	6%	17%	26%

Information available at:

<http://learnaboutmarijuanawa.org> and <https://adai.uw.edu>

# Introduction: Dr. Nephi Stella

25 years of research in medical properties of cannabis

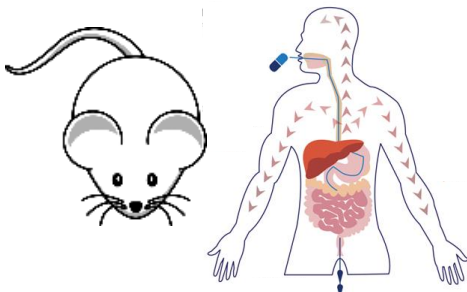
**A** Pharmacologist  
Basic Science  
Molecule to Human

Phytocannabinoids



**THC**  
**CBD**

Biological response

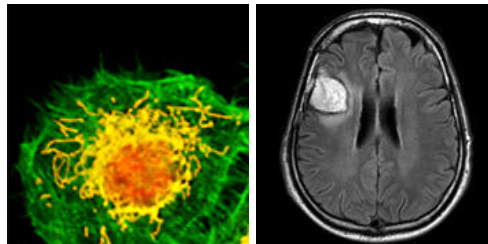


**B** Discover  
Medicines

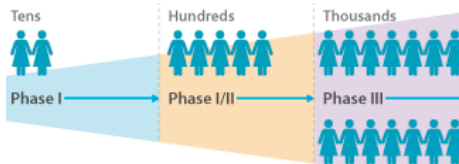
Epilepsy



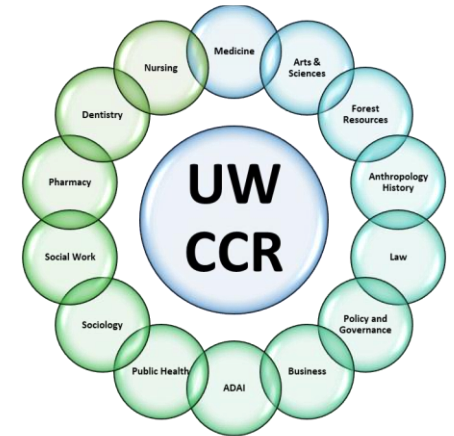
Brain Cancer



Human Trials



**C** Executive  
Director



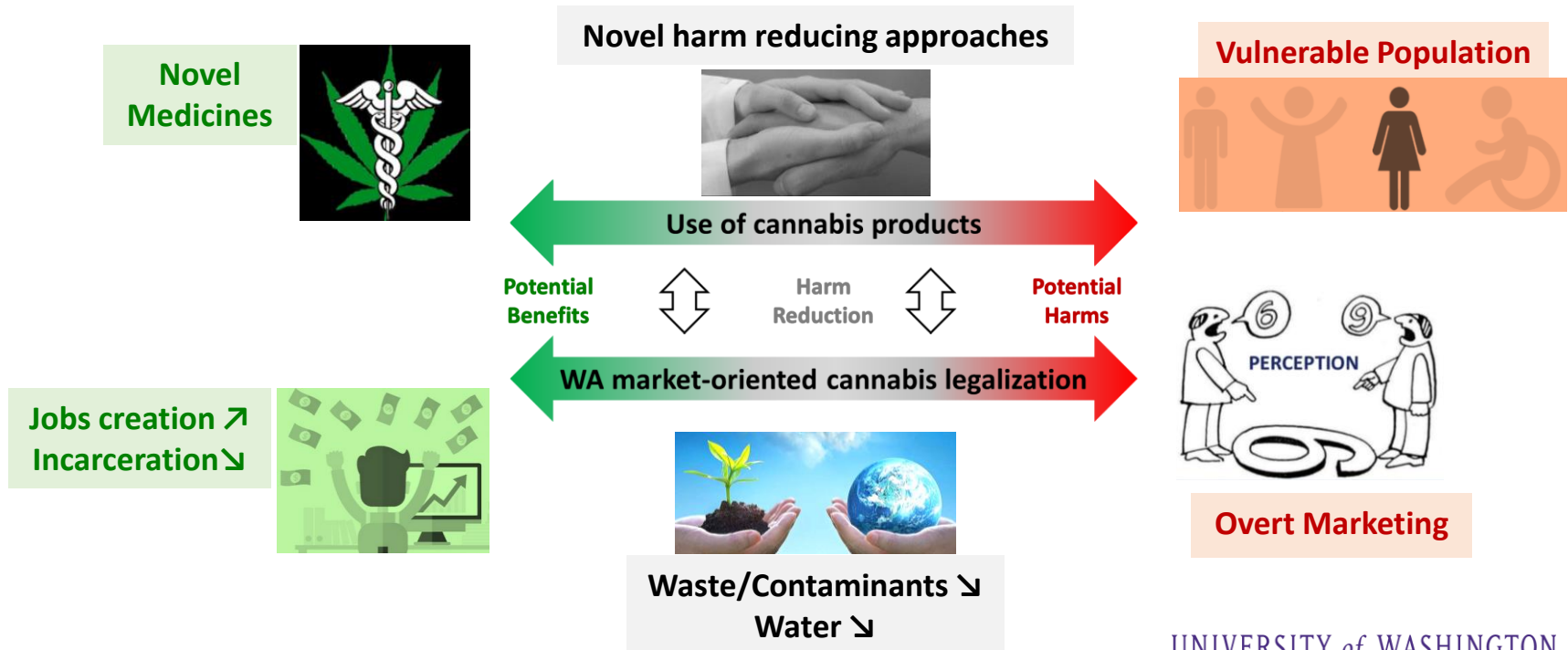
# Current Landscape: Federal and State Level

Impact occurs along a continuum

**A** Legalizations and policies



**B** Impact along a continuum



# Known: Differences between THC and CBD

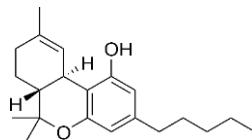
Accepted by scientific community

## A Difference Cannabis/Hemp?

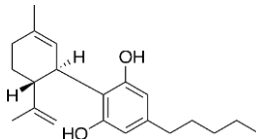


## B Phyto-Cannabinoids

THC



CBD



C

THC



CBD

Psychoactive - Enhances Sensory Awareness

Medical: Analgesic/Appetite

Side effects: Impact Brain Development

Side effects: "High" not always wanted

No "high" "Tames" THC properties

Medical: Anti-epileptic

Medical: Anti-inflammatory

Side effects: Different than CBD?



# THC: Response occurs along continuum

Strong evidence

UW Center of Excellence in Neurobiology of Addiction, Pain, and Emotion (NAPE)

*Kruse et al. (2019) Neuropsychopharm*

*Grant et al., (2018) Pharmacol Ther.*



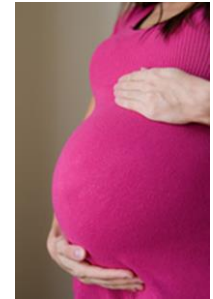
**Pain / Sleep  
Anxiety / Stress**



Opioid addiction



**Cognitive Impairment  
Cannabis Use Disorder**



# CBD: Response occurs along continuum

Strong evidence

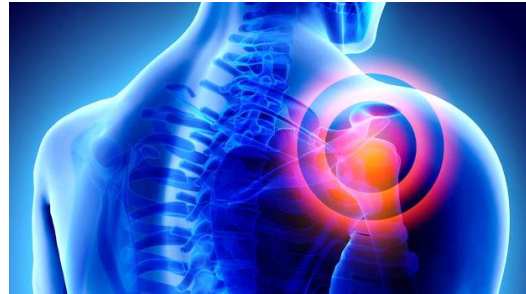
*Kaplan et al. (2018)*  
*Proc. Nat. Acad. Sci.*

**W** DEPARTMENT OF NEUROLOGY  
UNIVERSITY of WASHINGTON  
School of Medicine

University of Washington  
**Pharmacology**



**Epilepsy**



**Pain**



*Side effect?*



**Potential Benefits**

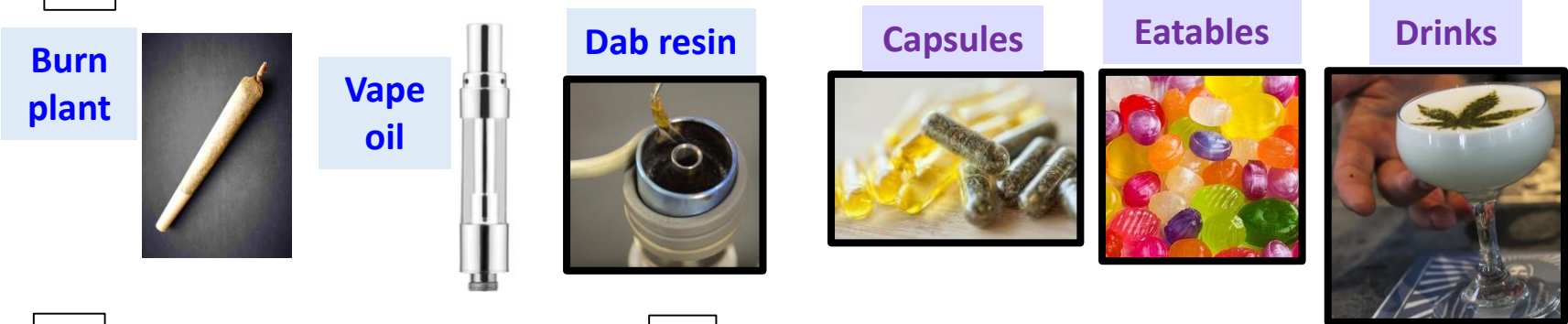
Harm Reduction

**Potential Harms**

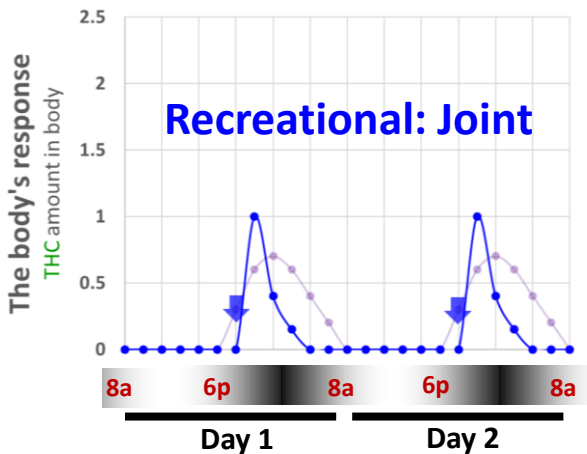
# Known: Delivery and select responses

Accepted by scientific community

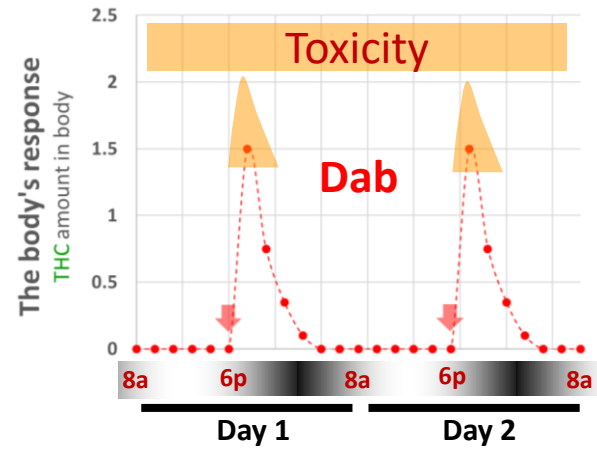
## A Delivery Systems: Lungs and digestive system



## B Outcome: Examples



## C Outcome: Predictions



**Concerns:**  
Higher potency  
Quicker onset  
Cannabis Use Disorder  
Vulnerable populations  
Toxicity of add-ons  
CBD Toxicity Profile?

► Need: THC/CBD Differences?

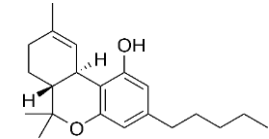
# Vulnerable Population: Age and subpopulations

## Brain development versus medicinal properties

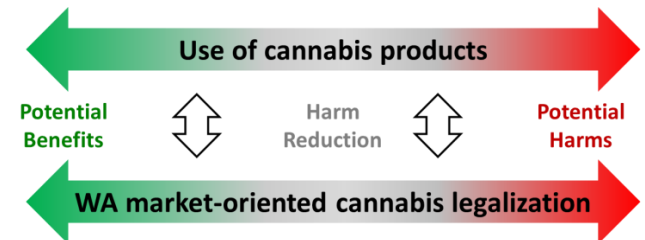
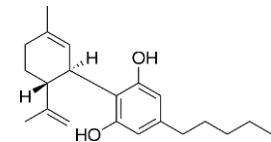
### Cannabis Use by Young Adults

- Most wide used “illegal” drug (i.e. Age 21).
- Concerns about new products!
- High THC affects young brain development
- Consequences on adult cognitive function

THC



CBD



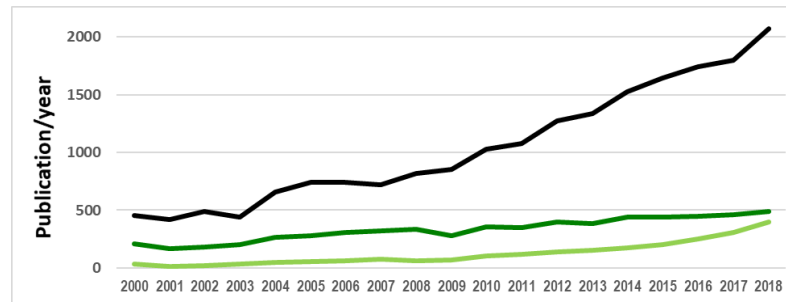
► **Need:** Understand the impact on vulnerable populations?

# Current Landscape: Research

## Cannabis-related research

**A**

**Cannabis-related publications**



*Key words:*

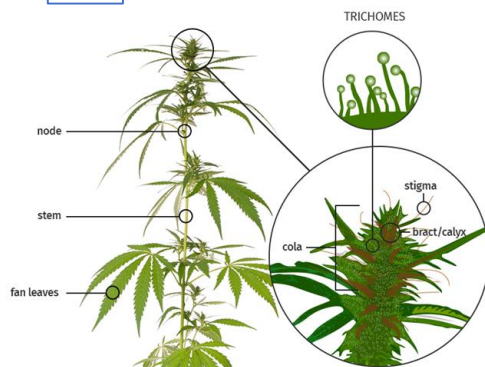
**Cannabis**

**THC**

**CBD**

**B**

**Research at every levels to help State of Washington**



**Basic  
Research**

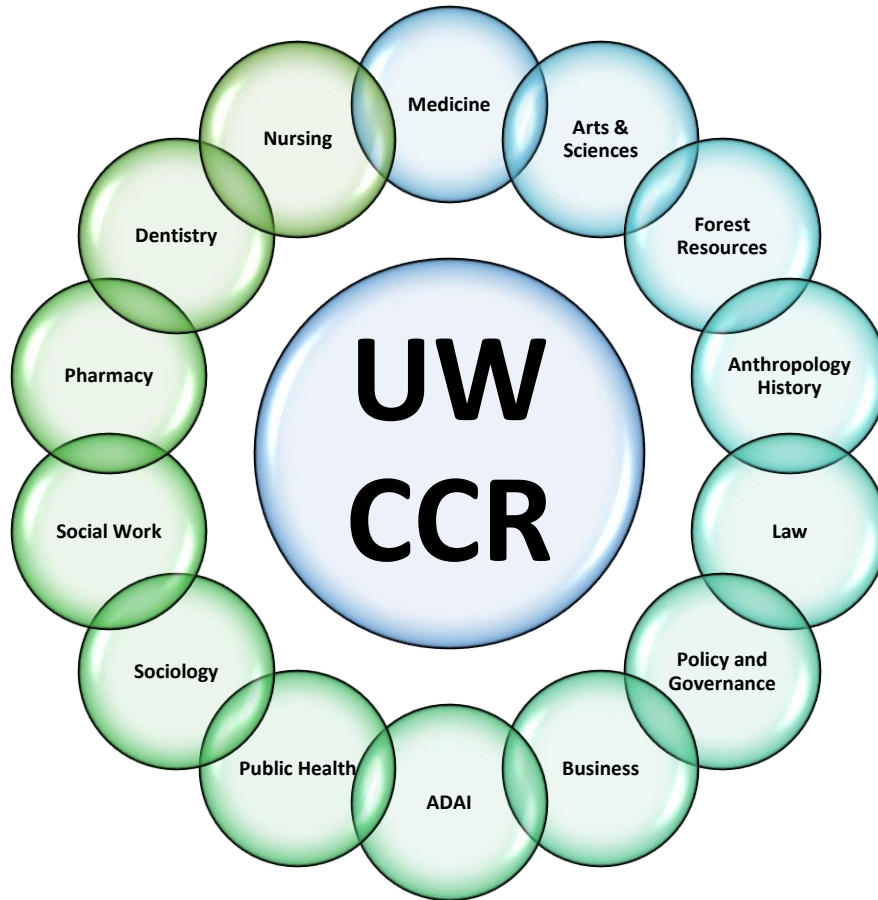
**Translational  
Research**



WASHINGTON STATE LEGISLATURE



► **Need:** Research to answer questions that are relevant to Washington State



## 2017: Implementation of UW-CCR

- Outline mission
- Identify researchers and partners

## 2018: First actions

- Board of Directors
- UW-CCR retreat (guests WSU)

## 2019: Impact and milestones

- Partnership with ADAI and WSU
- Interstate CCR network



WASHINGTON STATE LEGISLATURE



▶ **UW-CCR is a resource to solidify science on cannabis-related issues in WA state**



# Thanks!

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