### Marijuana and the Opioid Epidemic Kenneth Finn, MD kfinn@springsrehab.net

# EPIDEMIC



# **Endocannabinoid System**

- CB1 receptor
- Primarily localized in the central nervous system
  - Brain and spinal cord
  - Multiple neurotransmitter effects
- Can be found in the peripheral nervous system

# **Endocannabinoid System**

- CB2 receptor
  - Inflammation
  - Neuropathic pain
  - Cancer pain











### Dronabinol

THC



# **Opioids and Cannabinoid Signaling**

- <u>Synergistic systems</u>
- Both, when activated, reduce cellular levels of cyclic adenosine monophosphate (cAMP) by inhibiting adenylyl cyclase

https://www.tandfonline.com/doi/full/10.1080/24734306.2017.1392715

### Both belong to the rhodopsin subfamily of <u>G-protein coupled receptors</u>

# **Opioids and Cannabinoid Signaling**

- Receptor activation <u>modifies permeability</u> of sodium, calcium, and potassium channels
- Decreased Ca<sup>++</sup> conductance, increased K<sup>+</sup> conductance, and increased protein kinase activity
- Can suppress inhibition and suppress excitation
- Inhibit release of neurotransmitters
  - L-glutamate, GABA, NE, DA, 5-HT, ACh

# **Opioids and Cannabinoid Signaling**

- Both receptors found at presynaptic terminals
- Both receptors co-localize in <u>GABA-ergic neurons</u>
- Both systems <u>share</u> pharmacologic profiles
- Sedation, antinociception, hypotension, hypothermia, decreased intestinal motility, drug-reward reinforcement
- Naloxone may have effects on the cannabinoid system in several animal models

# Terminology

- Cannabis-based medication
  - based' medicines.
  - nabilone (synthetic)
- Medical cannabis
  - buds, leaves or full plant extracts used for medical reasons.
  - Poorly regulated and poorly tested for contaminants

Registered medicinal cannabis extracts with defined and standardized THC and THC/CBD content should be classified as 'cannabis-derived' or 'cannabis-

Examples: Epidiolex<sup>®</sup>, Sativex <sup>®</sup>(natural); dronabinol (semi-synthetic);

Cannabis plants and plant material, for example flowers, marijuana, hashish,

# National Ambulatory Care **Survey, 2016**

- National Survey
- Why people see their doctor
- Knee pain the only pain diagnosis in top 20 reasons
- other

 Others <u>not</u> in top 20: Back pain, Shoulder pain, Neck pain, Neuropathy, Headache, Fibromyalgia, Cancer, Seizure,

https://www.cdc.gov/nchs/data/ahcd/namcs\_summary/2016\_namcs\_web\_tables.pdf

- 2016, Health Affairs, Bradford: Medical Marijuana State Laws Associated With **Reduced Medicare Prescriptions**
- 2015
- synthetics, not dispensary cannabis
- Marijuana impedes pain control post trauma

• 2014, JAMA Internal Medicine, Bachhuber: Medical cannabis laws are associated with **lower state-level opioid overdose** mortality rates

• 2017, American Journal of Public Health, Livingston: Recreational Cannabis Legalization and **Opioid-Related Deaths** in Colorado, 2000–

• 2017, National Academies: <u>uncommon</u> pain conditions, nabiximols,

• 2017, Patient Safety in Surgery, Salottolo: Patient Safety in Surgery;

- **increases** risk of opioid use disorder and non-medical opioid use
- Population
- **<u>likely</u>** to use prescription drugs medically and non-medically
- <u>no products > 12.5%</u> THC
- use **reduced pain severity** or exerted **opioid sparing effect**

• 2018, American Journal of Psychiatry, January, Olfson: Cannabis use

 2018, JAMA Internal Medicine, Bradford: Association Between US State Medical Cannabis Laws and **Opioid Prescribing** in the Medicare Part D

• 2018, Journal of Addiction Medicine, April, Caputi: MMJ users are more

• 2018, European Pain Federation, June: Do not prescribe cannabis-based medicines to patients taking high doses of **opioids or benzodiazepines** and

• 2018, Lancet Public Health, Australian Study, July: No evidence that cannabis

- effective medicines for chronic non-cancer pain
- 2019, JAMA, Columbia University, July, Segura: People do not substitute marijuana for prescription opioids

- **<u>contributed</u>** to the national opioid mortality epidemic

2018, Journal of Pain, October: <u>Unlikely</u> that cannabinoids are highly

• 2019, PNAS, Stanford University, July, Shover: States with medical marijuana laws have seen a 23% **INCREASE** in opioid overdose deaths

• 2019, University of Houston, August, Rogers: Adults who mix cannabis with opioids for pain report higher levels of anxiety and depression

• 2019, Pain Medicine, September, Nugent: Legalizing marijuana has

- 2019, J Pain, September, Boehkne; <u>High frequency medical</u> chronic pain
- did not reduce cancer pain
- back pain
- increased.

cannabis use is associated with worse pain among individuals with

 2020, BMJ, Palliative and Supportive Care, February, Boland: For adults with advanced cancer, the addition of cannabinoids to opioids

• 2020, Neurosurgery, March, Kim: There is currently a **paucity of <u>clinical data</u>** supporting the use of cannabinoids in the treatment of

 2020, Pain Management Nursing, March: Depression, anxiety and cognition significantly worsened as the reported use of cannabis

- 2020, PLOS One, March, Cash, et. al.: THC concentrations in negative psychiatric risks
- cannabis use tended toward greater levels of pain intensity, current self-reported cannabis use
- <u>effects</u>.

dispensaries in regulated markets have concentrations are often twice or even three times too high for pain relief and may lead to other

• 2020, Pain Medicine, March, Sturgeon: Patients who reported ongoing

emotional distress, social isolation, fatigue, pain catastrophizing, sleep disturbance, and pain-related interference, compared with those with no

• 2020, Elsevier, April, Babalonis: Current data does not strongly **<u>support</u>** the use of cannabinoids for chronic pain nor do prospective studies demonstrate significant cannabinoid mediated **opioid-sparing** 

- professional
  - Medical users modally reported **daily use**

  - common (19.3%)

 2020, June, Turna; Comprehensive Psychiatry; Of all medical users, only **<u>23.4</u>%** reported authorization from a **<u>health</u>** 

• Compared to recreational users, medical users reported more problematic cannabis use in addition to greater psychiatric symptomatology (anxiety, depression and trauma)

 A large majority of <u>medical users also reported using</u> recreationally (80.6%), while exclusive medical use was less

### Drug overdose deaths in the U.S.

reached a record last year







### More than 90% of medical marijuana recommendations are Average for **pain**



2010 - Passage of HB 1284 and SB 10-109 establishing medical marijuana centers 2011 - Application processing backlog

Data collected by the Medical Marijuana Registry has evolved over the years. Additional data prior to 2009 is not available.

Average number of patients by year





Source: Vital Statistics Program, Colorado Department of Public Health and Environment

2019 data shows a **24% increase** (433 total) in prescription opioid overdose deaths and **<u>115% increase</u>** (220 total) in fentanyl deaths

### Number of drug overdose deaths by substances mentioned: Colorado residents, 2000-2019

### Public Health **Overdose Prevention Initiative** California Opioid Overdose Snapshot: 2016-Q1 through 2019-Q4

### Report downloaded 09-04-2020

California experienced 2,428 opioid-related overdose deaths in 2018, the most recent calendar year of data available. The annual crude mortality rate during that period was 6.14 per 100k residents. This represents a 18% increase from 2016. The following charts present 12-month moving averages for selected opioid indicators (prescription-, heroin-, and synthetic opioid-related overdose deaths, and ED visits related to any opioid) and include trend data for 2019. The map displays the annual county level age-adjusted rates for any opioid-related overdose deaths. Synthetic overdose deaths may be largely represented by fentanyl.



Footnotes: 12-month rates are based on moving averages; OD = Related Overdose Report produced by the California Opioid Overdose Surveillance Dashboard - https://cdph.ca.gov/opioiddasboard/

### **Overdose Prevention Initiative**



### Prescribing

There were 19,808,224 prescriptions for opioids (excluding buprenorphine) in California in 2018. The annual crude prescribing rate during that period was 500.75 per 1,000 residents. This represents a 18% decrease in prescribing from 2016. The following charts present 12-month moving averages for crude opioid prescribing rates, the crude rate of MMEs (morphine milligram equivalents) per person, the crude high dosage rate (greater than 90 Daily MMEs in the quarter), and the crude opioid/benzodiazepine overlap rate from 2016 to 2018.



### Treatment

Buprenorphine prescriptions in the state are used to gauge the expansion of medication-assisted treatment (MAT). The annual crude buprenorphine prescribing rate in 2018 was 14.9 per 1,000 residents. This represents a 13% increase in buprenorphine prescribing from 2016.



### https://skylab.cdph.ca.gov/ODdash/

### Colorado Health Institute Opioid Overdose Deaths by County 2002-2014

coloradohealthinstitute.org

### Colorado Drug Overdose Death Rate, 2002



### Colorado Drug Overdose Death Rate, 2005











Hundreds of U.S. cities and counties are parties to the suit, which claims that big-name manufacturers and distributors used deceptive advertising and marketing to overstate the benefits of and understates the risks of addiction. As a result, the suit says, governments have had to pay more for social services, law enforcement, and other government functions.

https://gazette.com/news/teller-county-set-to-join-lawsuit-against-big-name-pharma/ article\_f615c72e-babd-11e8-9ec1-b720631ea5ad.html

### Drug Overdoses **Increase During** Pandemic

Multifactorial New Suppliers/Substances Social Distancing/Isolation Shutdowns (drug courts, treatment centers, recovery programs) Lack of funding Deaths data pending

### Monthly overdoses grew dramatically during the pandemic

For every **10** suspected overdoses reported to ODMAP in May 2019 ...

... 14 overdoses were reported in May 2020.

Overdoses increased up to 42% per month during the pandemic, as compared to the same months in 2019.





Note: Percent growth references the 1,201 agencies reporting to ODMAP by January 2019.

Source: ODMAP

ALYSSA FOWERS/THE WASHINGTON POST

http://www.odmap.org/Content/docs/news/2020/ODMAP-Report-June-2020.pdf



### Figure 2: ODMAP submissions January 1, 2020 to March 18, 2020 compared to March 19, 2020 to May 19, 2020



http://www.odmap.org/Content/docs/news/2020/ODMAP-Report-June-2020.pdf

### Global Drug Survey Results During Pandemic **September 11, 2020**

- N=55,000
- A considerable proportion of respondents increased their use of opioids (28%).
- of **alcohol** they drank during the pandemic

## cannabis (44%), prescription benzodiazepines (34%) and prescription

Almost half (48%) survey respondents said they had increased the amount

http://www.russellwebster.com/gds-covid-uk/

### Circumstances

### Entire state:

1+ circumstances known	12,254
No circumstances known	733

- Current depressed mood
- Current diagonsed mental health problem
- Crisis two weeks prior to death
- Ever treated for mental health problem
- Left a suicide note
- Recently disclosed suicidal intent

### Contributing intimate partner problem

- Family relationship problem
- School problem
- Current mental health treatment
- Previous suicide attempt
- Argument precedded death
- History of suicidal thoughts or plans
- Problem with a substance other than alcohol
- Contributing criminal legal problem
- Problem with alcohol
- Non-suicide death of a friend or family member
- Contributing physical health problem
- Suicide death of friend or family
- Contributing job problem



1+ circumstances known	12,254
No circumstances known	733



### Trend **began 2012** and has **remained #1** since then

https://cohealthviz.dphe.state.co.us/t/HSEBPublic/views/CoVDRS\_12\_1\_17/ Story1?:embed=y&:showAppBanner=false&:showShareOptions=true&:display\_count=no&:showVizHome=no#4

- То
- N

### Toxcicology

### Entire state:

oxicology info available	10,781
o toxicology info available	2,206

### Selected population:

Toxicology info available No toxicology info available



### 10,781 2,206



### Increased Adolescent Cannabis Use During Pandemic September 2020

- N=1,054
- For most substances, the percentage of <u>users</u> decreased
- Since COVID-19-related social distancing began, the <u>frequency</u> of adolescent alcohol and cannabis use has increased.
- The frequency of <u>cannabis</u> use (average number of cannabis using days) increased significantly from pre-COVID to post-COVID
- The greatest percentage of adolescents was engaging in **solitary substance** <u>use</u> (49.3%), many were still using substances with peers via technology (31.6%) and, even face to face (23.6%)

J Adolesc Health. 2020 Sep; 67(3): 354–361 https://reader.elsevier.com/reader/sd/pii/S1054139X20303311? token=87E43249D556F37025CABEDC0691F1E8C8A561B513ADBE47B36A47A79EDDBAAD5BA22EFD51FD6319C43B1870C400A771

# **Cannabis Use and Depression**

- JAMA Psychiatry, August 18, 2020
- Adults 20-50 yo, N=16,216
- a particularly strong increase in daily or near daily cannabis use
- cannabis compared with people without depression
- from 2005 to 2016

https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2769386

# Individuals with <u>depression</u> are at <u>increasing risk of cannabis use</u>, with

Individuals with depression had approximately double the odds of using

The <u>association</u> between depression and cannabis use strengthened

### Healthy Kids Colorado Survey August 2020

- month, **up from 9.0%** in 2017
- they dab marijuana to get high
  - delivery system commonly referred to as a dab rig
- years
- their marijuana from an adult

• 32.4% of youth drove a vehicle after using marijuana in the past

• More than half of high school students who use marijuana reported that

Dabbing" is a method of inhaling **highly concentrated THC** (commonly referred to as hash oil, wax or shatter) using a **blow torch-heated** 

Results also show a <u>69% increase</u> in students vaping marijuana in two

### More than 20% of adolescents have <u>used in the past 30 days</u> and got

https://www.colorado.gov/pacific/cdphe/hkcs

	Table 1. Substance Use and Sexual Behavior among C of Electronic Vapor Products, in 2017.*	
	Variable	
	Binge drinking on ≥1 day in past 30 days‡	
	Use of opioid pain medicine without a prescription in lifetime	
	Use of marijuana in past 30 days	
	Use of cocaine >1 time in lifetime	
	Sex with $\geq 1$ partner during past 3 mo	
	Use of heroin >1 time in lifetime	
	Use of methamphetamines >1 time in lifetime	
,	* Data are from the Healthy Kids Colorado Survey. Of th	

- dents in Colorado.

### The NEW ENGLAND JOURNAL of MEDICINE

olorado High-School Students, According to Use or Nonuse				
All Students (N=45,385)	Recent Use of Electronic Vapor Product†			
	No (N=31,991)	Yes (N=13,394)		
percent (95 percent confidence interval)				
16.0 (15.2–16.8)	6.1 (5.6–6.5)	43.0 (41.3–44.7)		
12.4 (11.8–12.9)	7.1 (6.7–7.5)	26.0 (24.8–27.2)		
19.4 (18.4–20.4)	7.6 (6.7–8.4)	50.1 (49.2–52.7)		
5.0 (4.5–5.4)	1.4 (1.1–1.6)	14.2 (13.2–15.2)		
22.9 (21.9–24.0)	14.6 (13.7–15.5)	45.1 (43.8–46.4)		
1.5 (1.3–1.7)	0.5 (0.3–0.6)	3.7 (3.2–4.1)		
2.0 (1.8–2.2)	0.6 (0.5–0.8)	5.0 (4.5–5.6)		

ne 47,146 students who were surveyed, 45,385 provided answers to the questions listed in the table. Data were weighted to reflect the sociodemographic profile of the high school stu-

† Recent use was defined as the use of an electronic vapor product not including marijuana during the past 30 days. ‡ Binge drinking was defined as four or more drinks per day for female students and five or more for male students.



NOTE: In 2019 dabbing was added as a response option.

### https://www.healthvermont.gov/sites/default/files/documents/pdf/HSVR\_YRBS\_2019\_HSReport.pdf

### Youth Risk Behavior Surveillance System August 20, 2020

- misuse.
  - many others
- Every other drug among young people is going down with the **exception** of marijuana.
- **injecting** prescription opioids and developing an **opioid use disorder**

• Lifetime marijuana use is the **number one risk factor** for future prescription opioid

 Misuse of prescription opioids among youths is associated with <u>multiple adverse</u> health outcomes and risk behaviors, including use of alcohol and other illicit drugs, injection drug use, suicidal ideation, youth violence, delinquency, among

 Studies also have demonstrated that prescription opioid misuse among youths is strongly linked with subsequent initiation and use of heroin and increased risk for

https://www.cdc.gov/mmwr/volumes/69/su/su6901a5.htm?s\_cid=su6901a5\_w

### Adolescent Medical Marijuana Use August 20, 2020

- Medical cannabis use group reported
  - using cannabis more frequently,
  - were more likely to report <u>vaping and eating</u> cannabis,
  - had greater risk for cannabis dependence,
  - perceived cannabis as less harmful,
  - medicinal use of sedatives or tranquilizers, and

Journal of Adolescent Health xxx (2020) 1e7 https://pubmed.ncbi.nlm.nih.gov/32830007/

• were **more likely** to report tobacco use, recreational use of other drugs, and

• were less likely to report good health and sleeping for seven or more hours per night

# Youth Risk Behavior Survey August 2020

- the exception of marijuana.
- prescription opioid misuse.
- 43.5% of students who reported currently abusing prescription opioids also reported currently using marijuana

https://www.cdc.gov/mmwr/volumes/69/su/su6901a5.htm?s\_cid=su6901a5\_w

Every other drug among young people is going down with

Lifetime marijuana use is the number one risk factor for

 21.7% of high schoolers report marijuana use and the most common substances used were alcohol and marijuana

### Teen visits to Emergency Departments increase post legalization with 71% for psychiatric events (Colorado, Wang, 2018)

G.S. Wang et al. / Journal of Adolescent Health 63 (2018) 239–241



Figure 1. Annual marijuana-related emergency department (ED) and urgent care (UC) visits from a tertiary care children's hospital in Colorado.

### How Many People Develop CUD? October 2020

- The risk of developing <u>Cannabis Dependency</u> increased to <u>33%</u> use of cannabis
- during adolescence

Addictive Behaviors October 2020

 Among people who used cannabis, <u>22%</u> have Cannabis Use Disorder, 13% have Cannabis Addiction, and 13% have Cannabis Dependency

(22-44%) among young people who engaged in regular (weekly or daily)

There are higher risks among those who initiate early and use frequently

### **Colorado Suicides** All Age Groups



\* counts of less than 3 are suppressed



### COLORADO **Center for Health**

& Environmental Data

Department of Public Health & Environment

### Increased Medical Cannabis Use During Pandemic September 2020

- N=1,202 <u>adults >18</u>
- Mental health (76.7%), <u>pain</u> (43.7%), cardiometabolic (32.9%), respiratory (16.8%), and autoimmune (12.2%) conditions were <u>most reported</u>.
- Those with <u>mental health</u> conditions reported <u>increased</u> medicinal cannabis use by 91%
- <u>Clinical indications</u> for medicinal cannabis include <u>chronic conditions</u>; thus users (MCUs) are at an <u>increased risk</u> of morbidity and mortality resulting from SARS-CoV-2 infection (COVID-19)

Journal of Addictive Diseases; 2020 Sep 15; 1-11 https://www.tandfonline.com/doi/full/10.1080/10550887.2020.1811455

### **Cannabis Use and Opioid Misuse in Adults** September 2020

- **million** older adults Americans)
- not report non-medical opioid dependence and use (3.5%–3.7%).
- $\bullet$ opioids

Journal of Addictive Diseases, September 16, 2020 https://www.tandfonline.com/doi/full/10.1080/10550887.2020.1816117

• 75,949 adults <u>aged  $\geq$  50</u> who participated in the year 2002–2014 (NSDUH)

• 3.8% of the older adults reported past-year marijuana use (estimate 3.5)

• **Past-year marijuana use** was very common (25%–37%) among **non**medical opioid dependence respondents compared to those who did

Past-year marijuana use was significantly associated with an increase in odds of reporting opioid dependence, and past-year non-medical use

### Cannabis use on the rise in most jurisdictions where non-medical use legalized

- 2020 World Drug Report, United Nations Office on Drugs and Crime
- Canada, Uruguay and 11 jurisdictions in the United States allow the manufacture and sale of cannabis products for **<u>non-medical use</u>**
- In Colorado and Washington, two of the first states to pass legalization, increases in non-medical use of cannabis among adults, past month and daily, or near daily use has outstripped the national average since 2012
- Increases have also been seen in Uruguay (since 2011) and Canada (since 2018), coinciding with legalization

https://www.issup.net/files/2020-07/WDR20\_BOOKLET\_1.pdf





Source: SAMHSA, Center for Behavioral Health Statistics and Quality, NSDUH, 2017 and 2018

# Industry Failures

- Oregon Secretary of State, 2019: "Oregon's marijuana" and products are <u>safe</u>". Only <u>3% of stores</u> had a Documents/2019-04.pdf)
- tested/\

testing program cannot ensure that test results are reliable, compliance inspection. (*https://sos.oregon.gov/audits/* 

 California has an 18% fail rate and "unacceptable levels of pesticides, solvents, and bacteria, including E. coli and Salmonella" (<u>https://www.breitbart.com/local/2018/09/12/</u> report-california-regulators-fail-18-of-recreational-marijuana-

• Colorado does not test or recall products on a regular basis

### **Recall deals blow to California's marijuana** industry December 2018

- required under California law to analyze.
- material are under the recall.
- **pesticides** that were in the weed

Sacramento laboratory was caught <u>faking</u> pesticide test results

• The director, identified as Marc Foster, had for four months been **faking test results** for 22 of the 66 pesticides he was

 Nearly 850 batches — tens of thousands of pounds of flower, and an equal amount of other products, like oils and vaping

 2013 study published in the Journal of Toxicology found that people who smoked pot from a bong took in about half of the

https://www.sfgate.com/news/article/Recall-deals-blow-to-California-s-marijuana-13487748.php

### Med Man Issues Voluntary Nationwide Recall of **Up2 Due to Presence of Undeclared Sildenafil** November 8, 2019 **FDA**

- dysfunction.
- been established, therefore subject to recall.
- life threatening

https://www.fda.gov/safety/recalls-market-withdrawals-safety-alerts/med-manissues-voluntary-nationwide-recall-up2-due-presence-undeclared-sildenafil

• Sildenafil is an FDA-approved prescription drug for erectile

• The presence of sildenafil in Up2 products renders them unapproved drugs for which safety and efficacy have not

• **Undeclared ingredient** may interact with nitrates found in some prescription drugs, such as nitroglycerin, and may **lower blood pressure** to dangerous levels which can be

# Florida August 18, 2020

- flower
- tested above the acceptable limit for aspergillus
- Surterra Wellness dispensed **17,448,318 ounces** of July

http://www.floridahealth.gov/\_documents/newsroom/press-releases/2020/08/081920-ommu-press-release.pdf

• Florida medical cannabis company told to recall moldy

 The state health department's Office of Medical Marijuana Use said the product, Granddaddy Purple Whole Flower,

medical marijuana flower, a little more than 545 tons, in

# Driving, Marijuana, and Opioids

- test positive for prescription opioids
  - N=47,602)
  - for prescription opioids (National Roadside Survey, N=7,881)

Subst Abuse Treat Prev Policy 15, 12 (2020)

Drivers who test positive for marijuana are significantly more likely to

 Those testing positive for marijuana were <u>28% more likely</u> to test positive for prescription opioids (Fatality Analysis Reporting System,

Those testing positive for marijuana were twice as likely to test positive



The above data is part of the preliminary data released by CDOT in April of 2018.

SOURCE: **Colorado Department of Transportation**, *Cannabis Conversation* Survey

Percentage of Marijuana Users Who Admit to Driving High within the Last Year

> Have Not Driven High 31%

# A Few Other Medical Impacts



SOURCE: Colorado Department of Revenue, Colorado Liquor Excise Tax

### **Colorado Consumption of Alcohol**

156,506,200 150,669,971 143,468,372 142,970,403 153,523,326 146,985,944 141,184,231

### 2014 2015 2016 2017 2018 2019



### **American Heart Association** August 5, 2020



### Reprinted with permission Circulation.2020;142:e1-e22 ©2020 American Heart Association, Inc.



### Maternal cannabis use in pregnancy and child neurodevelopmental outcomes, August 2020

- Cannabis use in pregnancy was linked to an increased risk of preterm birth
- Women who used cannabis during pregnancy <u>often used other substances</u> including tobacco, alcohol and opioids.
- Considering those findings, in the current study the researchers specifically looked at 2,200 women who reported using only cannabis during pregnancy, and no other substances.
- Babies born to this group still had an increased risk of autism compared to those who did not use cannabis.
- The researchers specifically looked at 2,200 women who reported using **only** <u>cannabis</u> during pregnancy, and no other substances.

Corsi, D.J., Donelle, J., Sucha, E. et al. Maternal cannabis use in pregnancy and child neurodevelopmental outcomes. Nat Med (2020).

- cannabis for chronic non-cancer pain
- cannabis
- Cannabis users are <u>more likely</u> to develop opioid use

# Opioids

• There is **no evidence** supporting the use of **dispensary** 

There is <u>no evidence</u> for substituting opioids with <u>dispensary</u>

disorder or misuse their opioids and have higher depression and anxiety scores, and other potential psychiatric effects

 States with medical marijuana programs typically have <u>higher</u> opioid overdose deaths than non-medical marijuana states

# Action Plan

- Support FDA drug-development process for cannabinoids
- Limit potency (10% THC cap)
- Eliminate home grows: breeding ground for illegal activity
- Track, monitor, and document public health impact (health care utilization, ER, birth defects, etc)
- Have state data readily available to the public
- Mandatory drug testing for all violent crimes (cannabis psychosis)

# Action Plan

- Monitor adolescent use closely
- Discourage smoking and vaping
- Discourage use during pregnancy and lactation
- Drug testing/toxicology on all suicides, including adolescents
- Monitor marijuana-related driving fatalities
- Follow the science, not the money

### Kenneth Finn Editor **Cannabis in Medicine**

An Evidence Based Approach

Legalization of marijuana is becoming increasingly prominent in the United States and around the world. While there is some discussion of the relationship between marijuana and overall health, a comprehensive resource that outlines the medical literature for several organ systems, as well as non-medical societal effects, has yet to be seen. While all physicians strive to practice evidence-based medicine, many clinicians aren't aware of the facts surrounding cannabis and are guided by public opinion.

This first of its kind book is a comprehensive compilation of multiple facets of cannabis recommendation, use and effects from a variety of different perspectives. Comprised of chapters dedicated to separate fields of medicine, this evidence-based guide outlines the current data, or lack thereof, as well as the need for further study. The book begins with a general overview of the neurobiology and pharmacology of THC and hemp. It then delves into various medical concerns that plague specific disciplines of medicine such as psychiatry, cardiology, gastrointestinal and neurology, among others. The end of the book focuses on non-medical concerns such as public health and safety, driving impairment and legal implications.

Comprised of case studies and meta-analyses, Cannabinoids in Medicine: An Evidence-Based Approach provides clinicians with a concise, evidence-based guide to various health concerns related to the use of marijuana. By addressing non-medical concerns, this book is also a useful resource for professionals working in the public health and legal fields.

### https://bit.ly/3fFNRv7



### Cannabis in Medicine



Cannabis in Medic Ine

An Evidence Based Approach **Kenneth Finn** Editor



