



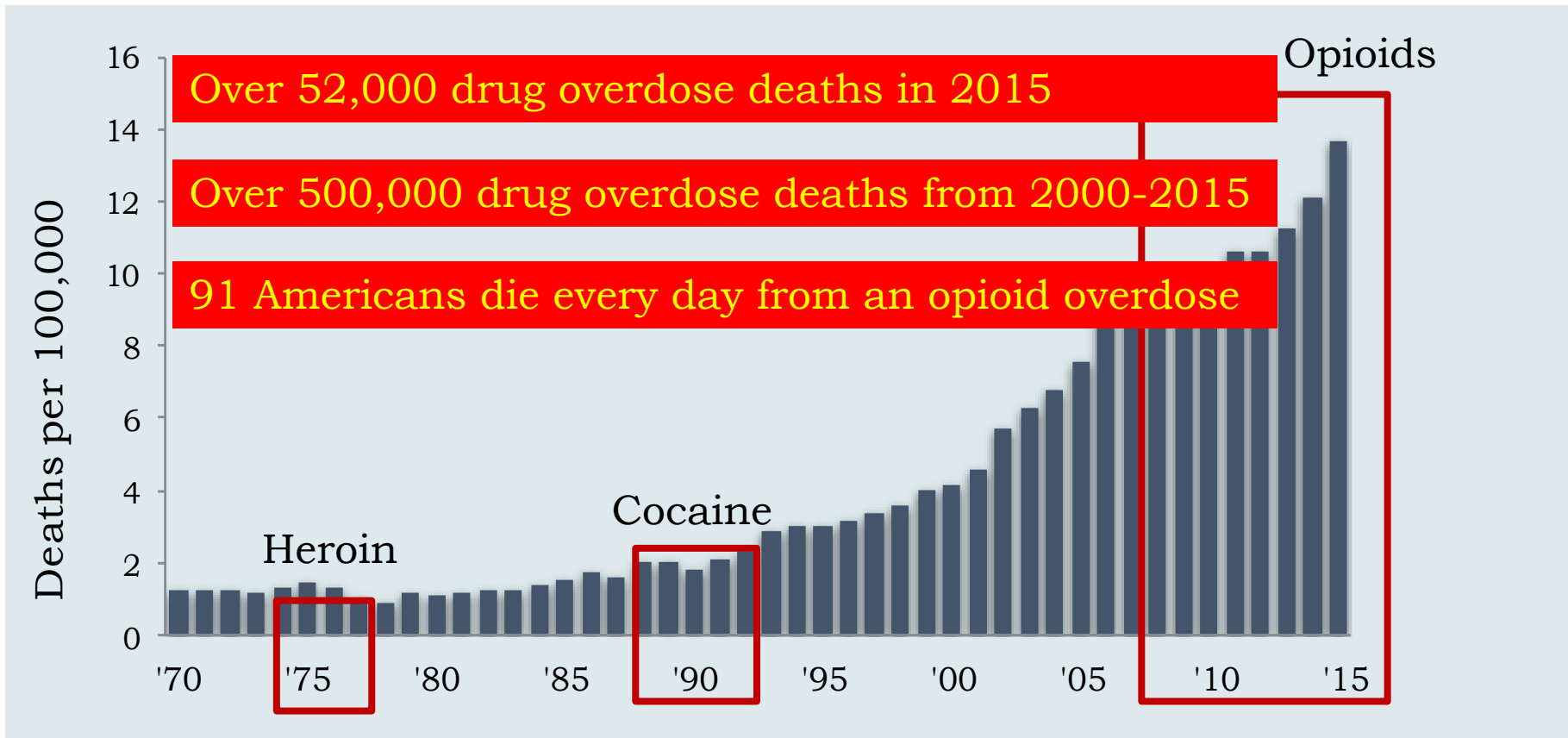
Montefiore
THE UNIVERSITY HOSPITAL

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OF YESHIVA UNIVERSITY

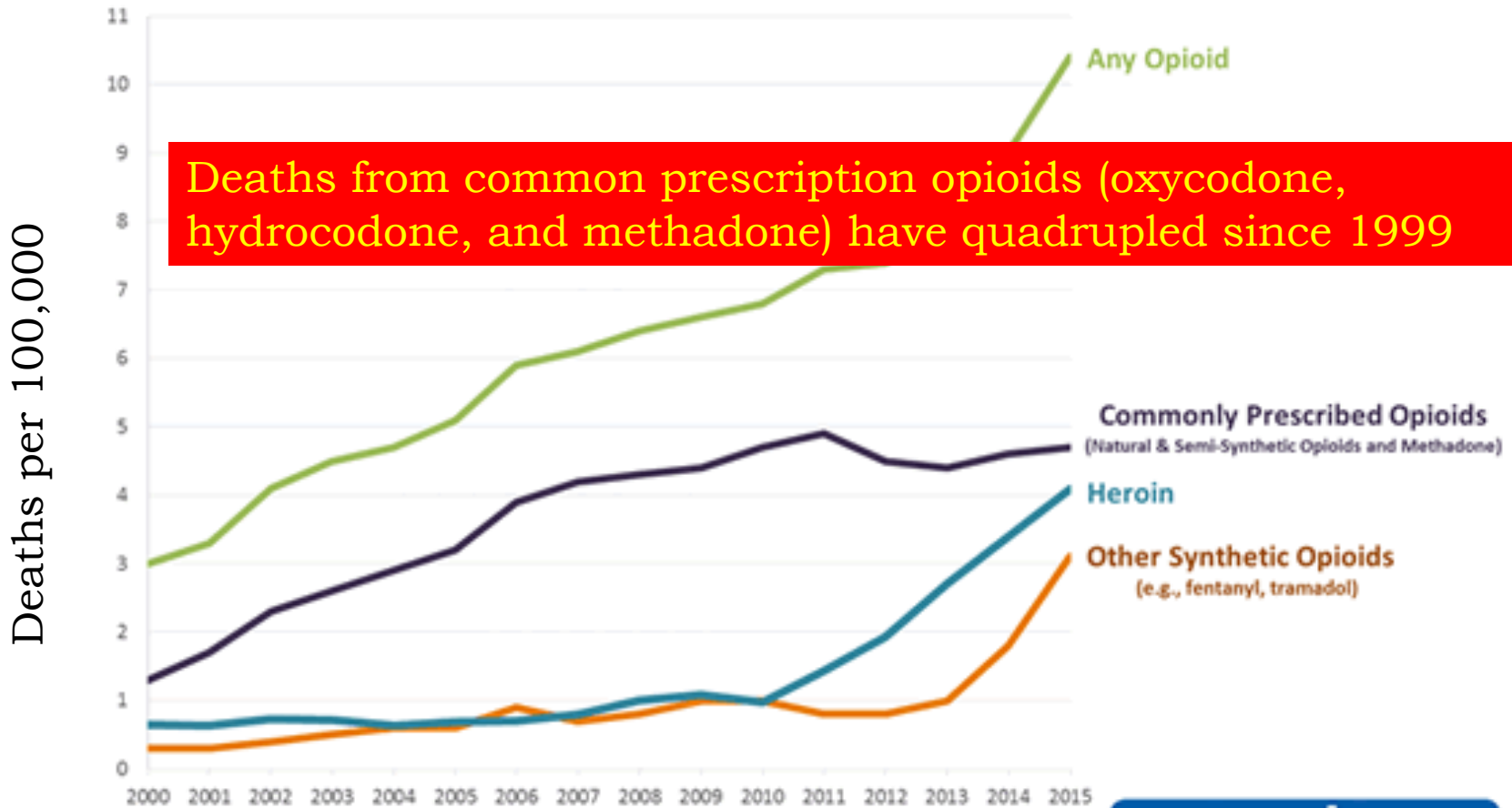
The Opioid Epidemic and Cannabinoid Alternatives for Treatment of Pain

Julia H. Arnsten, MD, MPH

Soaring drug overdose deaths in U.S.



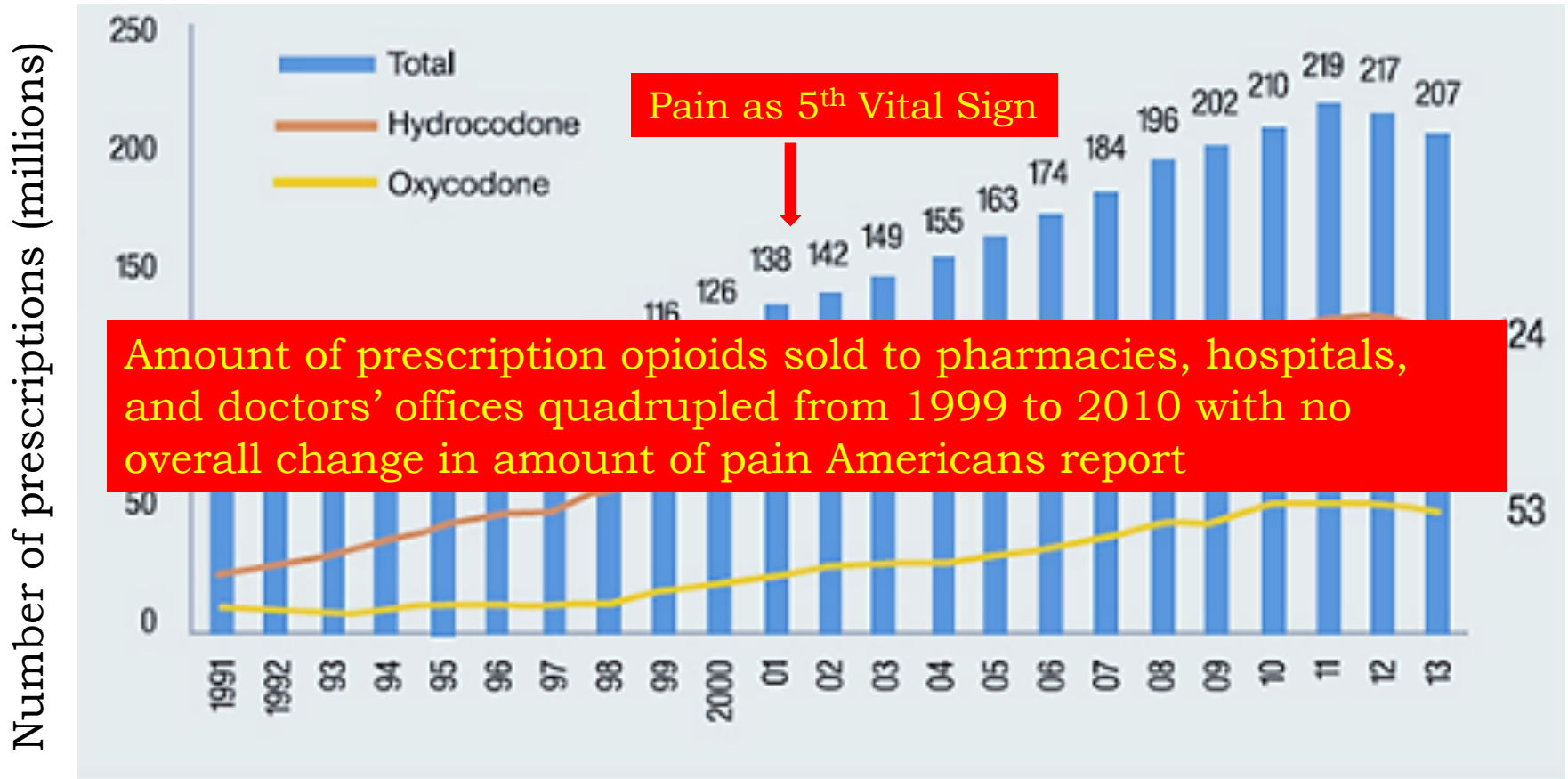
Opioid overdose deaths in U.S. driven by prescription opioids



SOURCE: CDC/NCHS, National Vital Statistics System, Mortality. CDC WONDER, Atlanta, GA: US Department of Health and Human Services, CDC; 2016. <https://wonder.cdc.gov/>.

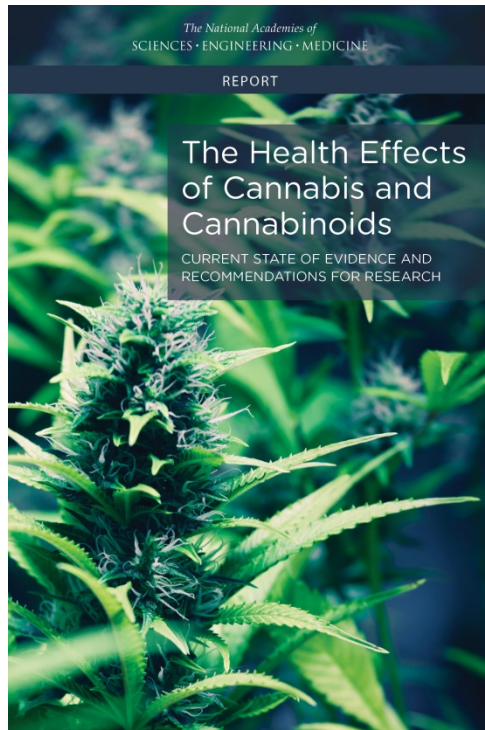
www.cdc.gov
Your Source for Credible Health Information

Increase in opioid prescriptions



Opioid prescriptions dispensed by U.S. retail pharmacies

Is medical cannabis an alternative to opioid medications for chronic pain?

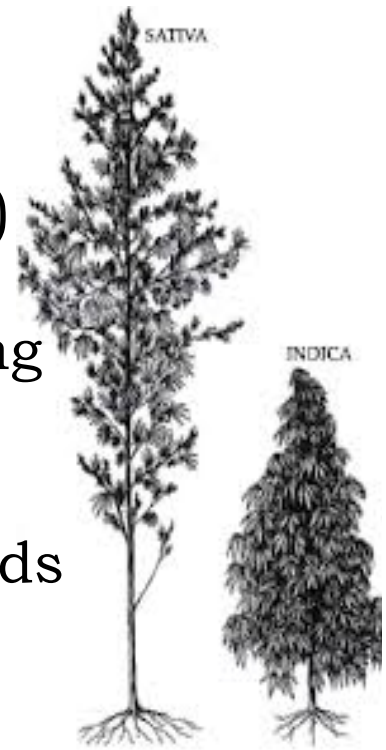


The National Academies of
SCIENCES • ENGINEERING • MEDICINE

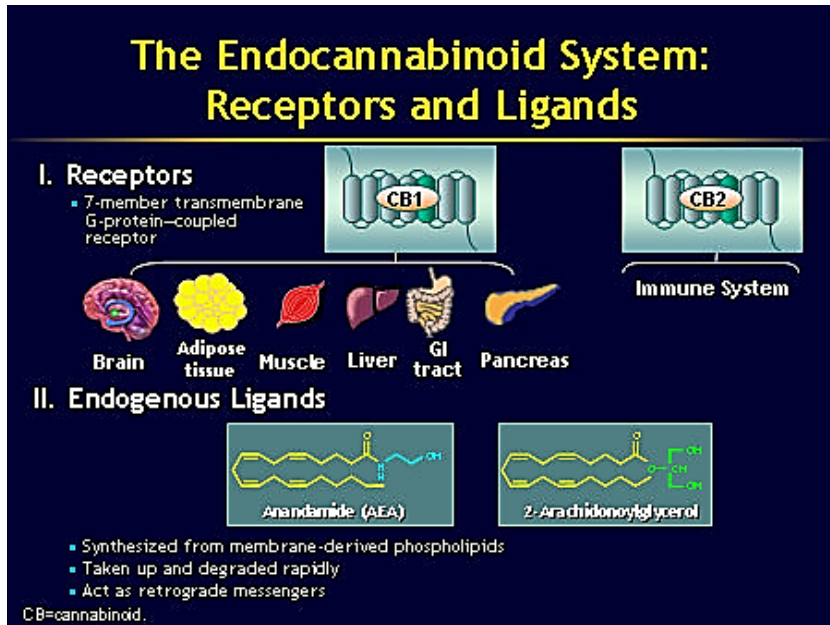
- ▶ 2017 report summarizing health impacts of cannabis and cannabis-derived products
- ▶ Patients treated with cannabis or cannabinoids more likely to have significant **reduction in pain symptoms**
- ▶ “Conclusive or substantial evidence” that **cannabis is effective for treatment of chronic pain in adults**

Cannabis Plants and Products

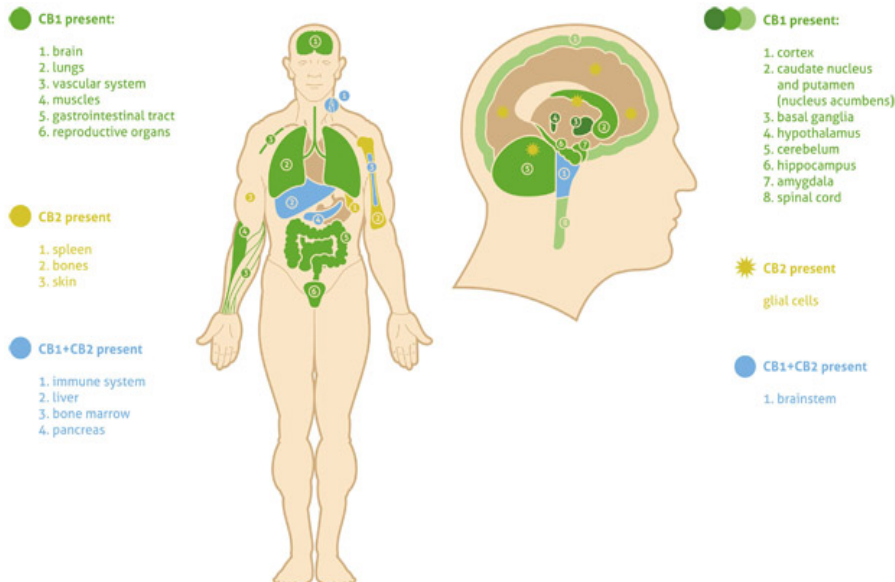
- ▶ Two major plant subspecies (many hybrids)
 - ▶ *Cannabis sativa*
 - ▶ Higher THC, higher potency, stimulating
 - ▶ *Cannabis indica*
 - ▶ Higher CBD, sedating
- ▶ Whole plant contains >60 **phyto**cannabinoids
 - ▶ THC (delta-9-tetrahydrocannabinol)
 - ▶ CBD (cannabidiol)
 - ▶ Ratio of THC:CBD engineered for effect
- ▶ Two FDA-approved cannabinoids (pills) in U.S.
 - ▶ Dronabinol
 - ▶ Synthetic chemical form THC (not naturally occurring)
 - ▶ Nabilone
 - ▶ Synthetic cannabinoid agonist, similar to THC



Human endocannabinoid system



- ▶ Target receptors
 - ▶ **CB1 receptors**
 - CNS, PNS, CV, GI, pulm, and repro systems
 - ▶ **CB2 receptors**
 - immune system, bone, skin
- ▶ Endogenous ligands are natural cannabinoid neurotransmitters
 - ▶ **AEA (Anandamide)** (100x less potent than THC)
 - ▶ **2-AG (2-arachidonyl glycerol)**
- ▶ Exocannabinoids THC and CBD bind to CB1 and CB2
 - ▶ THC: psychoactive
 - ▶ CBD: modifies effect of THC



Do cannabis and cannabinoids affect pain?

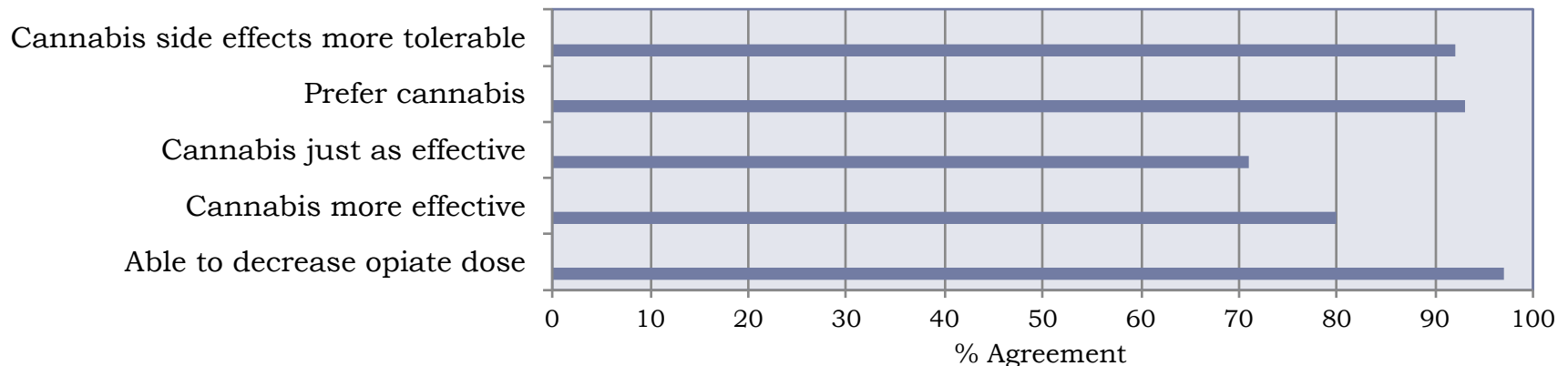
Summary of 4 meta-analyses

Author	Year	RCTs	Type of pain	Medication	Results
Iskedjian	2007	7	MS-related neuropathic pain	Cannabinoid medications (dronabinol, CBD)	Significant decrease in pain intensity
Martin-Sanchez	2009	18	Multiple non-malignant and malignant pain etiologies	Cannabinoid and plant-based medications	Significant pain reduction
Whiting	2015	8	Multiple non-malignant and malignant pain etiologies	Cannabinoid and plant-based medications, inhaled cannabis	Higher incidence of pain reduction
Andreae	2015	5	Chronic neuropathic pain	Inhaled cannabis	Short term pain intensity reduction
Aviram	2017	43	Multiple pain etiologies, including post-op	Cannabinoid and plant-based medications, inhaled cannabis	More pain reduction in chronic pain, especially by inhalation, compared to placebo

↓
2 studies of synthetic THC in post-op period

How does cannabis use affect use of opioids and other medications for chronic pain?

- ▶ 2897 medical cannabis users (841 opioid users) in California
- ▶ 244 medical cannabis users in Michigan



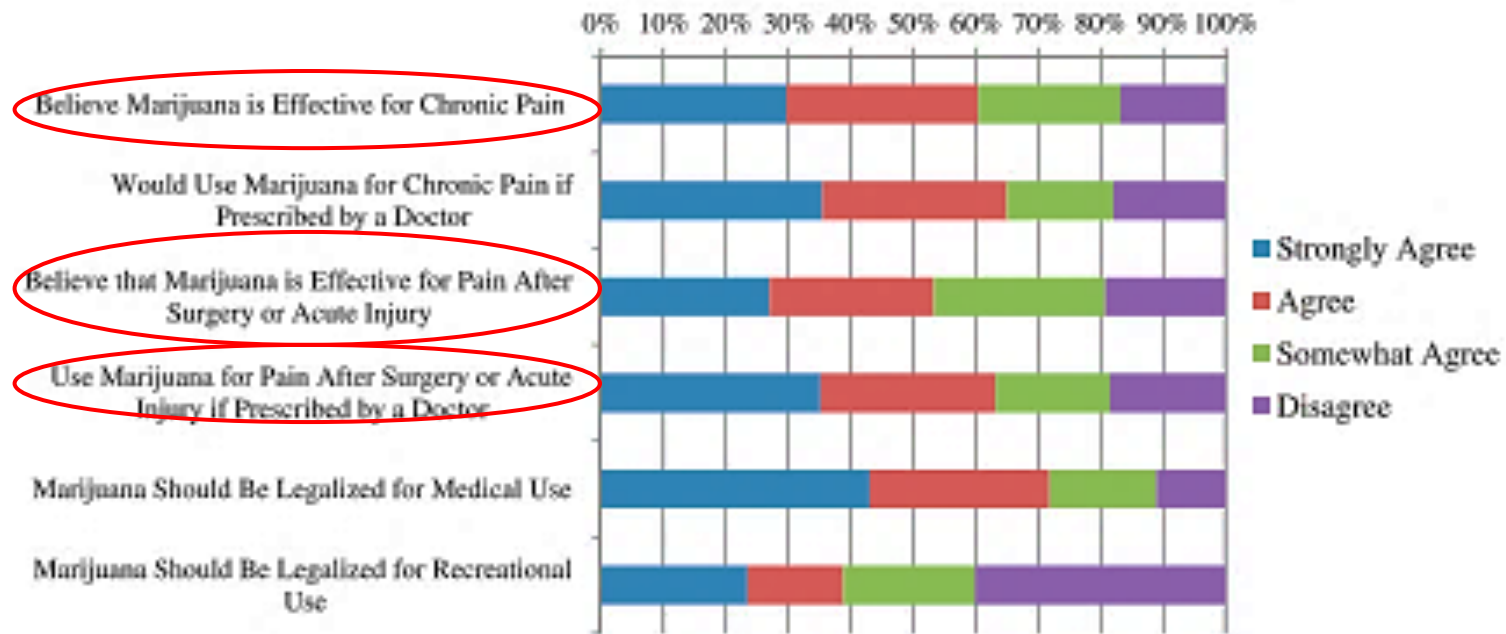
Medication type	Use before cannabis initiation	Use after cannabis initiation
Opioids	65%	18%
NSAIDs	62%	21%
DMARDs	8%	2%
Antidepressants	39%	14%
SSRIs	18%	4%

Boehnke et al, Journal of Pain, 2016

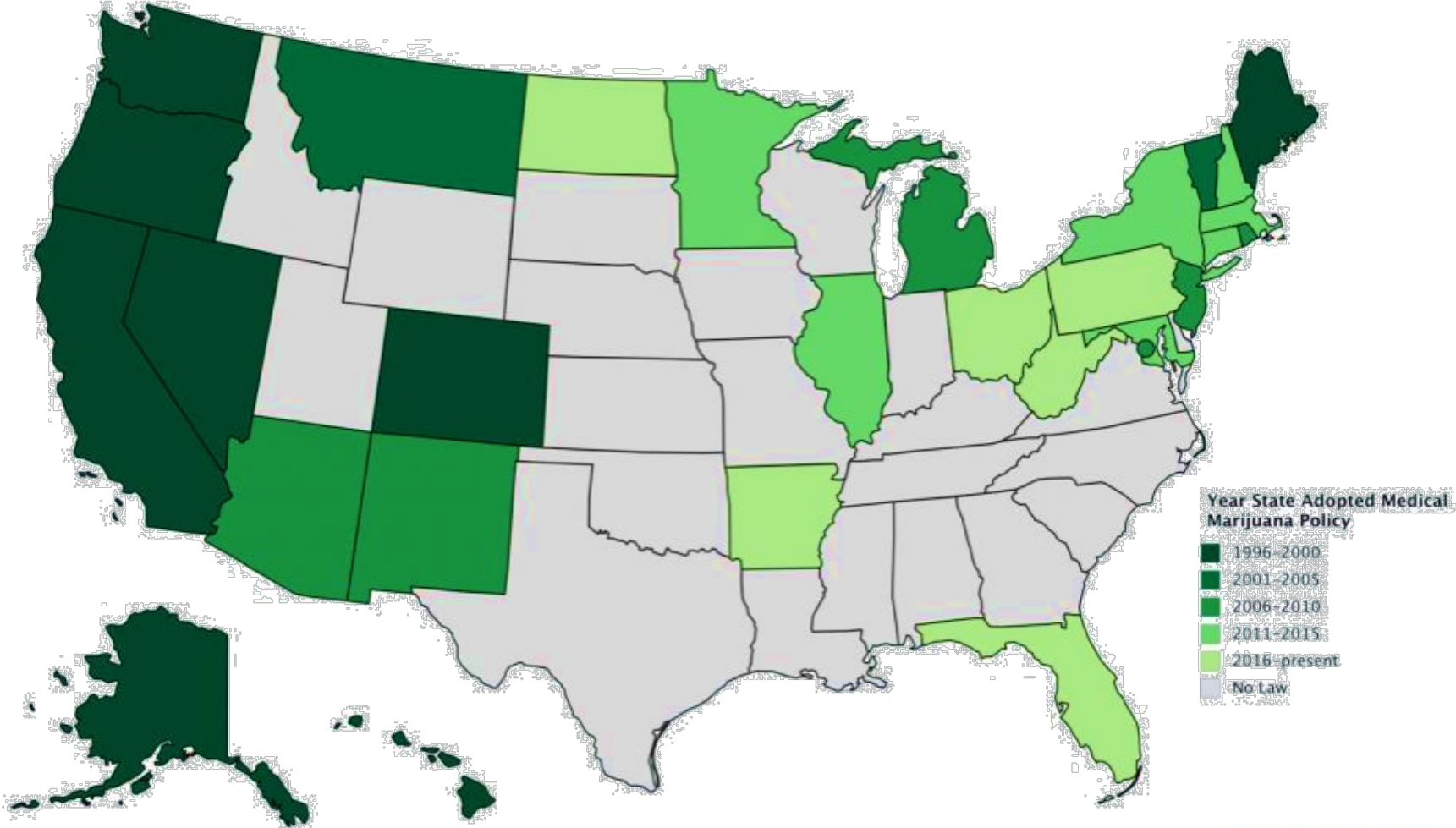
Reiman et al, Cannabis and Cannabinoid Research, 2017

Do surgical patients want to take medical cannabis?

- ▶ Survey of 501 pre-operative elective patients in NYC, 5/2016
- ▶ 27% with history of marijuana use
- ▶ 47% experienced daily pain, 10% taking chronic opioids
- ▶ Over 80% believe cannabis effective for chronic pain or pain after surgery, and would use if prescribed



Medical cannabis available since 1996, now in 29 states and Washington, D.C.



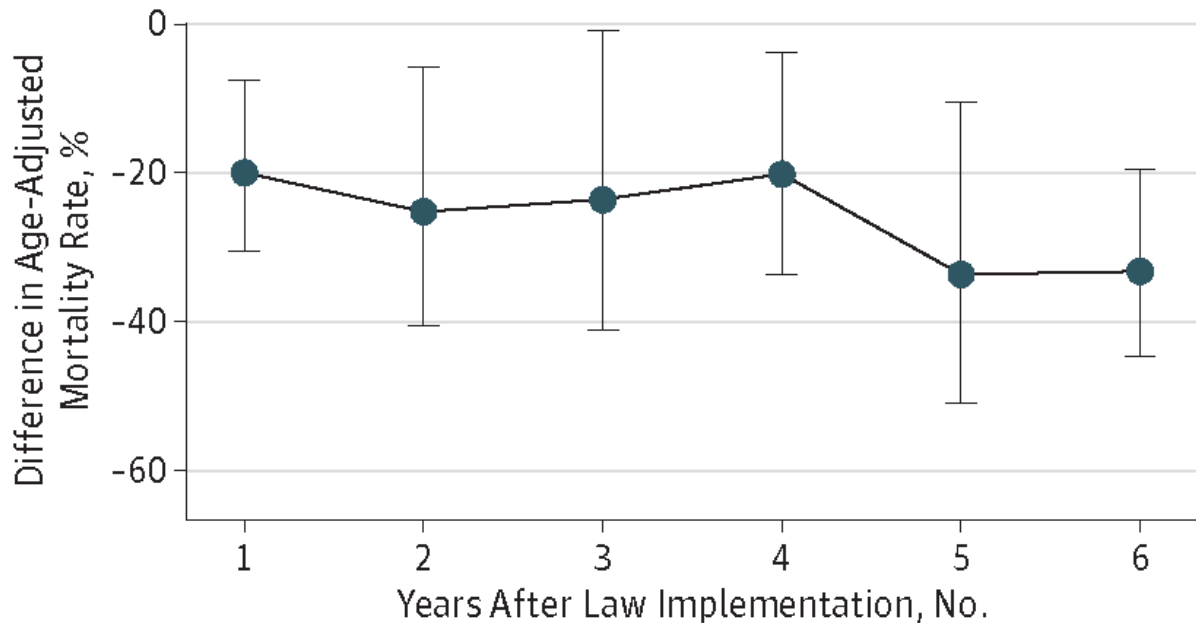
Lower opioid overdose mortality in states with medical cannabis laws

Original Investigation

Medical Cannabis Laws and Opioid Analgesic Overdose Mortality in the United States, 1999-2010

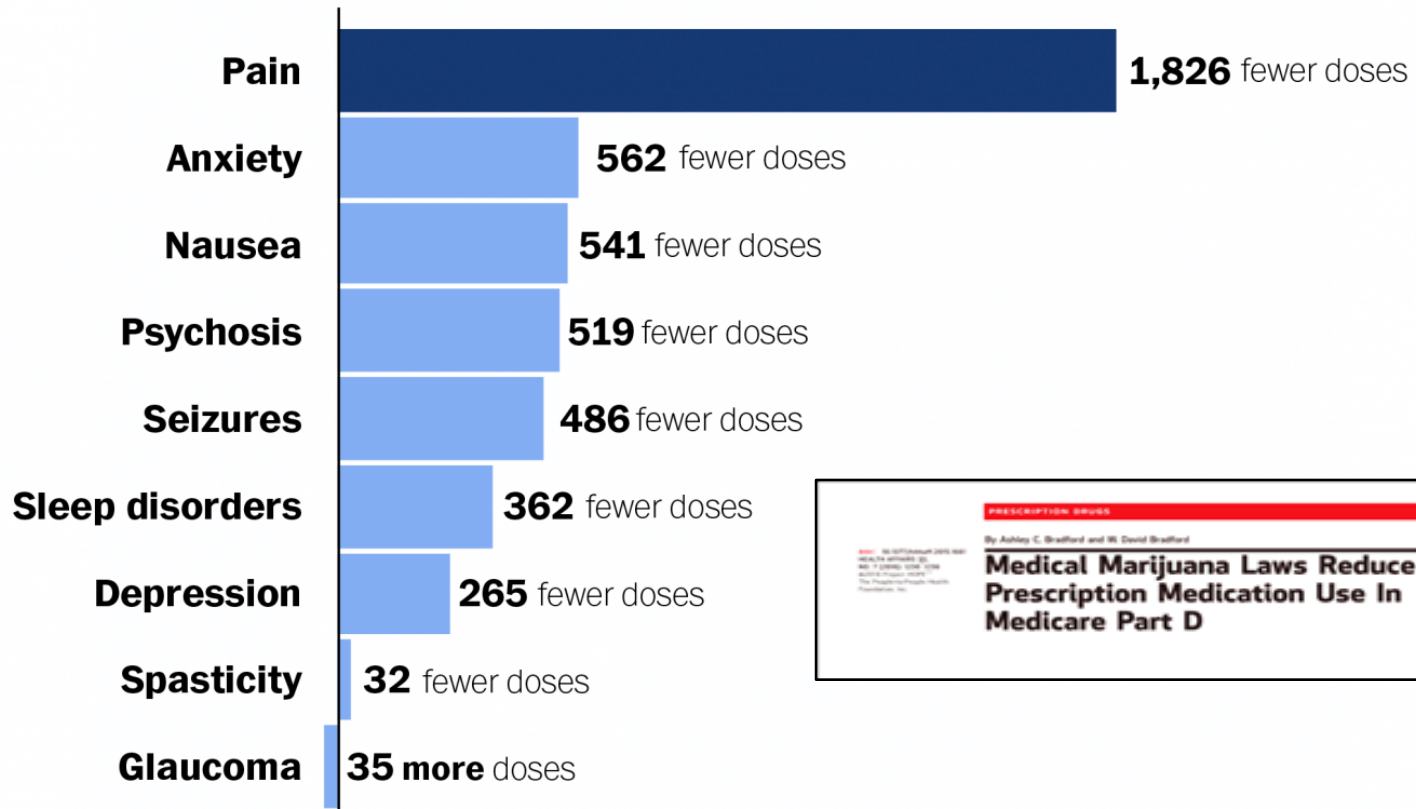
Marcus A. Bachhuber, MD; Brendan Saloner, PhD; Chinazo O. Cunningham, MD, MS; Colleen L. Barry, PhD, MPP

- 25% reduction in annual rate of opioid overdose deaths
- Each year after law approved associated with further decrease



Fewer pills prescribed in states with medical cannabis laws

Difference between annual drug doses prescribed per physician in medical marijuana states, and in states without medical marijuana laws, by drug category



Marijuana policies vary across states

- ▶ Marijuana is an *illegal* Schedule I drug under U.S. Federal law, but policies vary by state
- ▶ Some states have *legalized* use of recreational marijuana
 - ▶ Adults may legally possess and use marijuana
- ▶ Other states have *decriminalized* marijuana
 - ▶ Fines or civil penalties for possession/use of small amounts
- ▶ 29 states and D.C. allow medical marijuana
 - ▶ Individuals can defend themselves against criminal charges with documented medical need
 - ▶ Conditions vary from state to state but most states include:
 - ▶ Amyotrophic lateral sclerosis
 - ▶ Cachexia/wasting syndromes
 - ▶ Cancer
 - ▶ Crohn's disease
 - ▶ Epilepsy/seizures
 - ▶ Glaucoma
 - ▶ HIV/AIDS
 - ▶ Multiple sclerosis/muscle spasticity
 - ▶ Severe/chronic pain
 - ▶ PTSD

Different States, Different Laws

State	Year	Possession limit	Home cultivation ?	Chronic pain indication?
California	1996	8 oz usable; 6 mature or 12 immature plants	Yes	Yes
Colorado	2000	2 oz usable, 3 mature and 3 immature plants	Yes	Yes
Hawaii	2000	4 oz usable, 7 plants	Yes	Yes
Maine	1999	2.5 oz usable, 7 plants	Yes	Yes
Massachusetts	2012	60 day supply (10 oz) for personal use	Selected	Yes
Connecticut	2012	2.5 oz usable/month	No	Selected
New Jersey	2010	2 oz usable/month	No	No
New York	2014	30-day supply non-smokable marijuana	No	Yes

Medical Marijuana in New York State

- ▶ Operational as of January, 2016
 - ▶ Much more restrictive than other states
- ▶ Providers
 - ▶ Certify patients who then register with NYS state
 - ▶ 4-hour online course
- ▶ Patients
 - ▶ Must be diagnosed with a severe, debilitating or life threatening conditions
 - ▶ AND have an associated or complicating condition
 - ▶ Patients obtain products from dispensaries, home cultivation is NOT allowed, 30 day supply
- ▶ Products and product testing
 - ▶ 3 formulations
 - ▶ Liquid/oil for oromucosal/sublingual administration
 - ▶ Metered liquid/oil for vaporization
 - ▶ Capsules for oral administration
 - ▶ Registered organizations manufacture up to 5 “brands” including (1) equal ratio THC:CBD and (2) low-THC to high-CBD ratio
 - ▶ Testing is conducted for contaminants and cannabinoid profile by independent lab certified by NYS Environmental Laboratory Approval Program (NYSDOH Wadsworth Center).

Conditions

- ▶ Cancer
- ▶ HIV/AIDS
- ▶ Amyotrophic lateral sclerosis
- ▶ Parkinson's disease
- ▶ Multiple sclerosis
- ▶ Spinal cord injury with spasticity
- ▶ Epilepsy
- ▶ Inflammatory bowel disease
- ▶ Neuropathy
- ▶ Huntington's disease
- ▶ Chronic pain
- ▶ PTSD

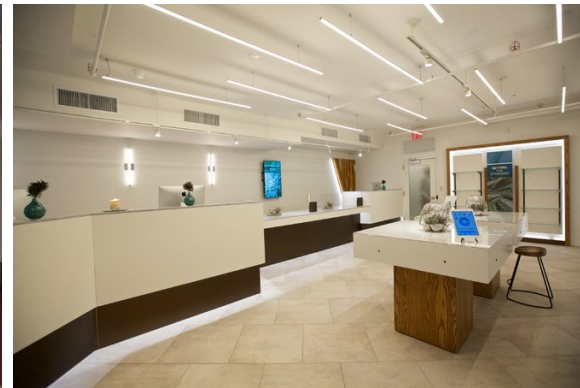
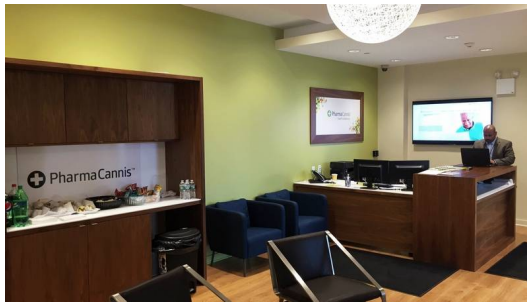
Associated or complicating conditions

- ▶ Cachexia/wasting
- ▶ Severe/chronic pain
- ▶ Severe nausea
- ▶ Seizures
- ▶ Severe or persistent muscle spasms



Medical Marijuana in New York State

- ▶ Initially 5 “Registered Organizations,” 5 more now approved
- ▶ Vertically integrated: farming, processing, distribution, and retail dispensaries (“seed-to-sale”)
- ▶ Dispensaries:
 - ▶ Only accept cash (no insurance) because of banking regulations
 - ▶ Some offer discounts for low-income patients
 - ▶ On-site clinical pharmacist works with patients to adjust dosing



How to certify patients

Welcome Marcus A Bachhuber

Search

My Applications

- Acronyms & Abbreviations
- Application Access
- CART
- Congenital Malformations
- Coord Account Tools - HCS
- Coordinator's Update Tool
- CSI on Dispensed Prescriptions
- Electronic Prescribing Waivers
- Emergency Contacts
- MMDMS
- Official Rx Order Entry
- Physician Profile
- PMP Registry
- ServNY

Refresh My Applications List

Important Health Events

ZIKA VIRUS RESPONSE

Visualization Portal

2016 HEC Worker Training

NYS PMP
PRESCRIPTION MONITORING PROGRAM REGISTRY

Important Health Notifications

Posted	Priority	Keyword	Source	Audience	Description	Recipients
05/09/2016	Advisory	Drug Shortage	NYSDOH		Bicillin L-A Shortage	Recipients
05/06/2016	Advisory	commissioners monthly letter	NYSDOH		Commissioners Letter: Happy Mothers Day	Recipients

Showing notifications sent in the past 30 days.

? Newer
Older ?

Newsroom Highlights...

New Items

05/10/2016	4-30-15 Weekly Influenza Report
05/05/2016	Center for Public Health Continuing Educ...
05/05/2016	Forgotten Password Tool for NYLearnsPH

Newsletters

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Summary

- ▶ Opioids are most common medication in overdose deaths
- ▶ Chronic pain affects >100 million Americans, commonly treated with opioids
- ▶ Medical cannabis since 1996 for multiple conditions, including chronic pain
 - ▶ Legal medical cannabis associated with 25% decrease in opioid overdoses
 - ▶ Fewer prescriptions for pain meds in medical cannabis states
- ▶ Many RCTs examined efficacy of cannabis, cannabis extracts, or synthetic cannabinoids in chronic pain
 - ▶ 5 meta-analyses suggest that some chronic pain improved (moderate evidence)
 - ▶ No benefit to post-op use of synthetic cannabinoids, but very few data
 - ▶ No data on post-op use of phytocannabinoids or cannabis extracts
 - ▶ Patients undergoing elective surgery interested in cannabis for pain
- ▶ Medical cannabis users decrease use of opioid and other pain meds
- ▶ NYS has comprehensive medical cannabis program since 2016
- ▶ More research needed to understand if cannabis is effective peri-operatively
- ▶ Thank you for attention!

