Medical Marijuana: Evidence-Based Education for Medical Students

UMass Medical School Capstone Project presented by Patrick McGuire, MS4
Pre/Post Survey

• Please complete the survey this link:
  http://tinyurl.com/zjnr3wy

(https://goo.gl/forms/GYfRtnRbUGDpp4wn1 if the above link doesn’t work)
Clinical Case

• JS is a 28yo M presenting to the medical marijuana clinic for consultation regarding chronic pain
• PCP records reveals history of MVA in 2010 with subsequent chronic lower back pain
• JS used oral opioids under a physician’s guidance to control this chronic pain until 2013, when use escalated to IV heroin
• While using IV heroin, JS contracted HCV and was briefly homeless; he has been off any opioids since January 2015
• JS has used MJ to control anxiety and for help with sleep since his teenage years and has several friends using medical MJ
• He is highly knowledgeable about strains of MJ and routes of administration
Medical Marijuana Learning Objectives

• What is it?
  • Learners will be able to describe the basic biological effects of cannabis.

• What’s allowed?
  • Learners will be able to describe current legislation of MMJ in MA in the context of federal MJ policies.

• What’s the evidence?
  • Learners will be able to identify the evidence-based indications for MMJ.

• What’s next?
  • Learners will be able to describe what safety and legal issues are likely to impact MMJ in the next 10 years.
Cannabis

• Genus of plant

• Produces dozens of cannabinoids, chiefly THC and CBD

• Dried flower is ingested by smoking, vaporizing, cooking
**Delta-9-tetrahydrcannabinol (THC)**

- Major psychoactive compound in cannabis
- Induces euphoria and anxiolysis at low doses, dysphoria and paranoia at higher doses
- Acts via partial agonism at CB1 receptors
- THC/CBD ratio can dictate extent of psychoactive effects

**Cannabidiol (CBD)**

- Thought to antagonize some of THC’s psychoactive effects
- Has been found to have anti-convulsant, anti-microbial, and anti-inflammatory action
- Acts via CB2 receptors found mostly on immune system cells
Cannabis Pharmacology

Decarboxylation reaction of $\Delta^9$-tetrahydrocannabinol

![Chemical structure of THCA and THC]

[https://www.whaxy.com/learn/what-are-cannabinoid-receptors](https://www.whaxy.com/learn/what-are-cannabinoid-receptors), accessed 10/3/16
Cannabis Pharmacology

Cannabinoid Receptors

- metabolic regulation
- appetite
- reward systems
- pain
- movement
- mood
- bone growth
- immune function

Video Link: http://adai.uw.edu/mcacp/module1/, slides 8 and 9
Medical Marijuana in America

States with laws approving medical use of marijuana
States with votes pending on medical use of marijuana

As of September 2016
Medical Marijuana in America

- Currently 26 states and Washington DC have approved laws permitting the medical use of MJ

- Laws generally require that patients have written certification by a physician of a debilitating medical condition for which benefits of MMJ use outweigh the risks

- California approved MMJ in 1996 for indications including, “any other illness for which marijuana provides relief.”

- Variable quantities permitted by state: Alaska allows 1 oz or 3 mature plants, Washington state allows up to 16oz or 15 plants with special permission

Federal Law

• DEA classifies MJ as Schedule I: “No currently accepted medical use.”

• Physician legal liability for certifying patients is unclear – 2002 Conant v. Walters offers some protection.¹

• 2013 DOJ Memo: “[rely] on states and local law enforcement agencies to address MJ activity through enforcement of their own narcotics laws.”²

• 2014 congressional spending bill banned DEA funds from being used on state MMJ cases.³

Controversy

- U of Washington CME: http://adai.uw.edu/mcACP/module1/
  Section 4, slides 26 and 27

- CNN’s Dr. Sanjay Gupta’s Weed: 
  https://youtu.be/Idujb84MwPE?t=38m22s

- The CARERS Act seeks to reschedule MJ from I to II, overhaul federal banking regulations with regard to MJ, and require the DEA to permit more MJ cultivation for FDA-approved research purposes

Source: https://www.govtrack.us/congress/bills/114/hr1538/summary, accessed 10/3/16
DEA Response

• In August 2016, DEA announced it will not reschedule MJ:

> Using established scientific standards that are consistent with that same FDA drug approval process and based on the FDA’s scientific and medical evaluation, as well as the legal standards in the CSA, marijuana will remain a schedule I controlled substance. It does not have a currently accepted medical use in treatment in the United States, there is a lack of accepted safety for its use under medical supervision, and it has a high potential for abuse.

(CSA = Controlled Substances Act)

• However, DEA did announce a change in MJ available for research:
• “DEA announced a policy change designed to foster research by expanding the number of DEA-registered marijuana manufacturers. This change should provide researchers with a more varied and robust supply of marijuana.”

Ballot Question 3 passed in November 2012, stating “there should be no punishment [for the medical use of MJ] under state law for qualifying patients,” who have been diagnosed by a licensed physician with a debilitating medical condition.

The qualifying debilitating medical conditions are:

- Cancer
- Multiple sclerosis
- HIV/AIDS
- Glaucoma
- ALS
- Hepatitis C
- Parkinson’s disease
- Crohn’s disease
- Other conditions as determined in writing by a qualifying physician

MA Legislature, [https://malegislature.gov/Laws/SessionLaws/Acts/2012/Chapter369](https://malegislature.gov/Laws/SessionLaws/Acts/2012/Chapter369), accessed 7/18/16
Obtain physician approval of “debilitating medical condition” ($200-$350)

Register with state ($50)

Renew state registration annually ($50 per year)

Renew approval with certifying physician – every 3 to 12 months (cost varies)

Renew marijuana license every three years
Purchase MMJ from state-licensed dispensary*

Renew state registration annually ($50 per year)

Renew approval with certifying physician – every 3 to 12 months (cost varies)

Renew marijuana license every three years

State-licensed dispensaries are currently active in: Ayer, Boston, Brockton, Brookline, Lowell, Northampton, Salem, and Quincy.

*Individuals may grow their own MJ if there is no dispensary within 25 miles
Current state of MMJ in MA

Current state of MMJ in MA

Patients who Purchased Medical Marijuana

<table>
<thead>
<tr>
<th>Month</th>
<th>Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jul-15</td>
<td>624</td>
</tr>
<tr>
<td>Aug-15</td>
<td>874</td>
</tr>
<tr>
<td>Sep-15</td>
<td>2,432</td>
</tr>
<tr>
<td>Oct-15</td>
<td>3,854</td>
</tr>
<tr>
<td>Nov-15</td>
<td>4,673</td>
</tr>
<tr>
<td>Dec-15</td>
<td>5,692</td>
</tr>
<tr>
<td>Jan-16</td>
<td>5,698</td>
</tr>
<tr>
<td>Feb-16</td>
<td>7,304</td>
</tr>
<tr>
<td>Mar-16</td>
<td>8,873</td>
</tr>
<tr>
<td>Apr-16</td>
<td>10,462</td>
</tr>
<tr>
<td>May-16</td>
<td>11,682</td>
</tr>
<tr>
<td>Jun-16</td>
<td>12,752</td>
</tr>
<tr>
<td>Jul-16</td>
<td>13,928</td>
</tr>
<tr>
<td>Aug-16</td>
<td>15,232</td>
</tr>
<tr>
<td>Sep-16</td>
<td>15,846</td>
</tr>
</tbody>
</table>
Current state of MMJ in MA

Patients who Purchased Medical Marijuana

Aggregate RMD Business Activity

<table>
<thead>
<tr>
<th>Unique Patients Served</th>
<th>September</th>
<th>FY Total through September 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>15,846</td>
<td>15,157</td>
<td>21,714</td>
</tr>
<tr>
<td>151</td>
<td>234</td>
<td>43,907</td>
</tr>
</tbody>
</table>

MMJ Challenges for MA

• As of October 2015, there had been 16,589 physician certifications
  • 31.4% were for “diseases of the musculoskeletal system and connective tissue”
  • 26.7% were for “mental and behavioral disorders”\(^1\)

• In May 2016, two MDs had their licenses suspended due to inappropriate MMJ approvals
  • Drs. Cushing and Nadolny were responsible for a combined 10,441 certifications\(^2\)

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\(^1\) Massachusetts DPH, personal communication with presenter, 3/25/16
Is marijuana an effective medication?

- There are many challenges to studying efficacy of MMJ:
  - As a Schedule I drug, MJ research is more tightly controlled. One farm in Mississippi is source of all federally approved MJ.
  - Heterogeneity of strains – relative ratios of THC and CBD can impact activity of medication.
  - Smoked medications are difficult to study and MJ has many other routes of administration. Recent meta-analysis of RCTs only had 7 out of 79 that administered smoked MJ.\(^1\)

Is marijuana an effective medication?

• Dronabinol (Marinol): FDA approved synthetic delta-9-THC. RCT evidence supports use for **loss of appetite associated with AIDS** and **N/V associated with chemotherapy**.

• Nabilone (Cesamet): FDA approved synthetic THC analog. RCT evidence supports use for **N/V associated with chemotherapy**.

• Nibiximols (Sativex): Oromucosal spray of equal parts delta-9-THC and CBD, approved in UK and Canada. RCT evidence supports use for **spasticity due to multiple sclerosis**.

• Cannabidiol (Epidiolex): CBD extract in Phase 3 trials for use in **childhood seizure syndromes** not responsive to other treatments.
Medical Marijuana for Treatment of Chronic Pain and Other Medical and Psychiatric Problems
A Clinical Review

Kevin P. Hill, MD, MHS

• Review article from June 2015 published in JAMA concluded there is acceptable evidence for using MMJ in chronic pain and neuropathic pain

• The studies analyzed in this review present challenges due to the variability in routes of ingestion, strains of MJ, and sample sizes

Is marijuana an effective medication?

<table>
<thead>
<tr>
<th>Source</th>
<th>Drug (Maximum Dose), Route</th>
<th>Control</th>
<th>Sample Size, Experimental Condition/Control</th>
<th>Primary Outcome</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic pain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skrabek et al, 2008</td>
<td>Nabilone (2 mg) orally</td>
<td>Placebo</td>
<td>n=20 Nabilone; n=20 placebo (fibromyalgia)</td>
<td>VAS</td>
<td>Significant decrease in VAS (-2.04; P &lt; .02)</td>
</tr>
<tr>
<td>Narang et al, 2008</td>
<td>Dronabinol (20 mg) orally</td>
<td>Placebo</td>
<td>n = 29 Placebo; n = 30 dronabinol, 10 mg; n = 29 dronabinol, 20 mg</td>
<td>Total pain relief at 8 h</td>
<td>Significant increase in Total pain relief, dronabinol conditions (20 mg vs placebo at P &lt; .01; 10 mg vs placebo at P &lt; .05)</td>
</tr>
<tr>
<td>Frank et al, 2008</td>
<td>Dihydrocodeine (240 mg), nabilone (2 mg) orally</td>
<td>Crossover</td>
<td>n=48 Dihydrocodeine followed by nabilone; n=48 nabilone followed by dihydrocodeine (chronic neuropathic pain)</td>
<td>VAS</td>
<td>Dihydrocodeine provided better pain relief than nabilone (6.0; 95% CI, 1.4-10.5; P=.01)</td>
</tr>
<tr>
<td>Pinser et al, 2006</td>
<td>Nabilone (1 mg) add-on orally</td>
<td>Placebo</td>
<td>n=30 Crossover</td>
<td>VAS</td>
<td>Significant decrease in VAS (P &lt; .006)</td>
</tr>
<tr>
<td>Wissel et al, 2006</td>
<td>Nabilone (1 mg) orally</td>
<td>Placebo</td>
<td>n=13 Crossover</td>
<td>11-Point box test (pain rating)</td>
<td>Significant decrease in pain rating (P &lt; .05)</td>
</tr>
<tr>
<td>Blake et al, 2006</td>
<td>Nabiximols: THC (15 mg)/cannabidiol (13.5 mg) oromucosal spray</td>
<td>Placebo</td>
<td>n=31 Nabiximols; n=27 placebo</td>
<td>Pain on movement</td>
<td>Significant decrease in pain (-0.95; 95% CI, -1.85 to -0.02, P=.04)</td>
</tr>
</tbody>
</table>
Is marijuana an effective medication?

<table>
<thead>
<tr>
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</tr>
</thead>
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</tr>
</tbody>
</table>

No smoked marijuana studies!
Is marijuana an effective medication?

<table>
<thead>
<tr>
<th>Neuropathic pain</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ellis et al,\textsuperscript{22} 2009</td>
<td>Cannabis (1%-8% THC) smoked</td>
</tr>
<tr>
<td>Abrams et al,\textsuperscript{23} 2007</td>
<td>Cannabis (3.56% THC) smoked</td>
</tr>
<tr>
<td>Wilsey et al,\textsuperscript{24} 2008</td>
<td>Cannabis (7%, THC) smoked</td>
</tr>
<tr>
<td></td>
<td>Placebo</td>
</tr>
</tbody>
</table>
Is marijuana an effective medication?

<table>
<thead>
<tr>
<th>STRAIN</th>
<th>TYPE</th>
<th>TAC</th>
<th>THC</th>
<th>CBD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tangerine Haze</td>
<td>S</td>
<td>18.6%</td>
<td>18.2%</td>
<td>0%</td>
</tr>
<tr>
<td>Dela Haze</td>
<td>S</td>
<td>20.5%</td>
<td>19.8%</td>
<td>0%</td>
</tr>
<tr>
<td>Lee Roy</td>
<td>H</td>
<td>20.2%</td>
<td>19.7%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Hurricane</td>
<td>H</td>
<td>17.4%</td>
<td>16.9%</td>
<td>0%</td>
</tr>
<tr>
<td>Gorilla Glue</td>
<td>H1</td>
<td>17.8%</td>
<td>17.4%</td>
<td>0%</td>
</tr>
<tr>
<td>Platinum Bubba Kush</td>
<td>I</td>
<td>24.8%</td>
<td>24.5%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Source: [http://netacare.org/BrooklineQuickView.pdf](http://netacare.org/BrooklineQuickView.pdf), accessed 10/4/16
Is marijuana an effective medication?

- Kowal\(^1\) and Whiting\(^2\) support Hill’s finding that MMJ may be efficacious in treating chronic pain, particularly neuropathic pain.
- These authors add support for MMJ in treating multiple sclerosis symptoms, nausea/vomiting and anorexia associated with HIV/AIDS.
- Kowal’s paper cites 3 articles supporting CBD as anti-anxiety agent, and one where CBD outperformed amisulpride as anti-psychotic – psychiatric indications are understudied.

- Glaucoma?
- Hepatitis C?
- Parkinson’s Disease?
- ALS?


Childhood Epilepsy

• Topic of popular media coverage on MMJ – covered extensively in Dr. Gupta’s Weed

• Extracts from high CBD strains of MJ have been used to treat refractory epilepsy¹,²

• Pediatric MMJ approval in MA requires 2 physicians including pediatrician

• GW Pharmaceuticals will be pursuing FDA approval of CBD to treat Dravet and Lennox-Gastaut Syndromes in 2017


Back to the Case

• 28yo M with hx of chronic lower back pain, IVDU, and Hep C, presenting to MMJ clinic requesting approval for use of MJ to control symptoms of pain, anxiety, and insomnia.

1. For what debilitating conditions does he fulfill approval criteria according to state law?

2. For what indications is there evidence from randomized-controlled trials that MJ will help this patient?

3. Are the any contraindications to MMJ in this case?

4. What adverse effects may occur in this patient?
What are the risks?

Does marijuana use affect driving?

Marijuana significantly impairs judgment, motor coordination, and reaction time, and studies have found a direct relationship between blood THC concentration and impaired driving ability.\(^6\)\(^-\)\(^8\)
What are the risks?

Marijuana use disorder becomes addiction when the person cannot stop using the drug even though it interferes with many aspects of his or her life. Estimates of the number of people addicted to marijuana are controversial, in part because epidemiological studies of substance use often use dependence as a proxy for addiction even though it is possible to be dependent without being addicted. Those studies suggest that 9 percent of people who use marijuana will become dependent on it,\(^{23,24}\) rising to about 17 percent in those who start using young (in their teens).\(^{25,26}\)

relationship between blood THC concentration and impaired driving ability.\(^{6–8}\)
Marijuana cannot stop young (in their early 20s) addicted to marijuana use, and the risk is many times higher than those who use it less frequently. As a proxy for dependence, 9 percent of young (in their early 20s) addicted to marijuana are at risk for developing psychosis later in adulthood. The AKT1 gene governs an enzyme that affects brain signaling involving the neurotransmitter dopamine. Altered dopamine signaling is known to be involved in schizophrenia. AKT1 can take one of three forms in a specific region of the gene implicated in susceptibility to schizophrenia: T/T, C/T, and C/C. Daily users of marijuana (green bars) with the C/C variant have a seven times higher risk of developing psychosis than infrequent marijuana users or nonusers. The risk for psychosis among those with the T/T variant was unaffected by whether they used marijuana.

Can marijuana use during and after pregnancy harm the baby?

Animal research suggests that the body's endocannabinoid system plays a role in the control of brain maturation, particularly in the development of emotional responses. Thus THC exposure very early in life may negatively affect brain development. Research in rats suggests that exposure to even low concentrations of THC late in pregnancy could have profound and lasting consequences for both brain and behavior of offspring.\(^76\) Human studies have shown that the T/T variant was unaffected by whether they used marijuana.

Back to the case

• 28yo M with hx of chronic lower back pain, IVDU, and Hep C, presenting to MMJ clinic requesting approval for use of MJ to control symptoms of pain, anxiety, and insomnia.

• Should we approve this patient for MMJ?

• If so, how much?

• If not, do you think it will impact how much MJ he uses?
Back to the case

- 28yo M with hx of chronic lower back pain, IVDU, and Hep C, presenting to MMJ clinic requesting approval for use of MJ to control symptoms of pain, anxiety, and insomnia.

- Should we approve this patient for MMJ?

- If so, how much?

  10oz = 280 grams; 0.33-0.5g per MJ cigarette. 10oz = over 500 joints for 60 days, or over 8 per day; Q3hr dosing

- If not, do you think it will impact how much MJ he uses?
So, was he approved for MMJ?

What do I need to do, exactly, to get a recommendation for Medical Marijuana?

You would need a condition that responds well to it.

I've got that.

Oh? And that is?

Sobriety.

I see. And your symptoms?

I'm not high all the time.

www.penny-arcade.com

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The Future

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

- What do you predict the impact of MMJ is on rates of opiate overdose?
The Future

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

- What do you predict the impact of MMJ is on rates of opiate overdose?

CONCLUSIONS AND RELEVANCE  Medical cannabis laws are associated with significantly lower state-level opioid overdose mortality rates. Further investigation is required to determine how medical cannabis laws may interact with policies aimed at preventing opioid analgesic overdose.
The Future

Massachusetts DPH, personal communication with presenter, 3/25/16

<table>
<thead>
<tr>
<th>ICD-10 Code</th>
<th>Count of ICD-10 Code</th>
<th>Percentage of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease(s) of the musculoskeletal system and connective tissue</td>
<td>5,202</td>
<td>31.4%</td>
</tr>
<tr>
<td>Mental and behavioral disorder(s)</td>
<td>4,424</td>
<td>26.7%</td>
</tr>
<tr>
<td>Disease(s) of the nervous system</td>
<td>4,096</td>
<td>24.7%</td>
</tr>
<tr>
<td>Neoplasm(s)</td>
<td>733</td>
<td>4.4%</td>
</tr>
<tr>
<td>Disease(s) of the digestive system</td>
<td>558</td>
<td>3.4%</td>
</tr>
<tr>
<td>Symptom(s), sign(s) and abnormal clinical and laboratory finding(s), not</td>
<td>422</td>
<td>2.5%</td>
</tr>
<tr>
<td>elsewhere classified</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certain infectious and parasitic disease(s)</td>
<td>379</td>
<td>2.3%</td>
</tr>
<tr>
<td>Disease(s) of the eye and adnexa</td>
<td>219</td>
<td>1.3%</td>
</tr>
<tr>
<td>Disease(s) of the blood and blood-forming organ(s) and certain</td>
<td>196</td>
<td>1.2%</td>
</tr>
<tr>
<td>disorder(s) involving the immune mechanism</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Injury, poisoning and certain other consequence(s) of external cause(s)</td>
<td>99</td>
<td>0.6%</td>
</tr>
<tr>
<td>Endocrine, nutritional and metabolic disease(s)</td>
<td>70</td>
<td>0.4%</td>
</tr>
<tr>
<td>Disease(s) of the skin and subcutaneous tissue</td>
<td>50</td>
<td>0.3%</td>
</tr>
<tr>
<td>Disease(s) of the genitourinary system</td>
<td>41</td>
<td>0.2%</td>
</tr>
<tr>
<td>Congenital malformation(s), deformation(s) and chromosomal abnormality(s)</td>
<td>29</td>
<td>0.2%</td>
</tr>
<tr>
<td>Disease(s) of the respiratory system</td>
<td>25</td>
<td>0.2%</td>
</tr>
<tr>
<td>Disease(s) of the circulatory system</td>
<td>19</td>
<td>0.1%</td>
</tr>
<tr>
<td>Disease(s) of the ear and mastoid process</td>
<td>12</td>
<td>0.1%</td>
</tr>
<tr>
<td>External cause(s) of morbidity</td>
<td>11</td>
<td>0.1%</td>
</tr>
<tr>
<td>Unidentified</td>
<td>4</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>16,589</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>
The Future

By Ashley C. Bradford and W. David Bradford

Medical Marijuana Laws Reduce Prescription Medication Use In Medicare Part D

ABSTRACT Legalization of medical marijuana has been one of the most controversial areas of state policy change over the past twenty years. However, little is known about whether medical marijuana is being used clinically to any significant degree. Using data on all prescriptions filled by Medicare Part D enrollees from 2010 to 2013, we found that the use of prescription drugs for which marijuana could serve as a clinical alternative fell significantly, once a medical marijuana law was implemented. National overall reductions in Medicare program and enrollee spending when states implemented medical marijuana laws were estimated to be $165.2 million per year in 2013. The availability of medical marijuana has a significant effect on prescribing patterns and spending in Medicare Part D.
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Marijuana market growth

Projected value of marijuana sales in Massachusetts if legalized

- $1 billion
- $200 million
- $500k


Recreational use
Medical use

SOURCE: ArcView Market Research and New Frontier
GLOBE STAFF

The Future

Baker, Walsh, and DeLeo combine to oppose marijuana legalization

SOURCE: ArcView Market Research and New Frontier

GLOBE STAFF

http://www.massmed.org/Patient-Care/Health-Topics/Recreational-Marijuana/Ballot-Question-4--Recreational-Marijuana-Booklet/, accessed 10/13/16
The Future

Baker, Walsh, and DeLeo combine to oppose marijuana legalization

Massachusetts Medical Society
Every physician matters, each patient counts.

Ballot Question 4: Recreational Marijuana in Massachusetts
Information for Physicians

Bad for kids. Bad for public health.

http://www.massmed.org/Patient-Care/Health-Topics/Recreational-Marijuana/Ballot-Question-4--Recreational-Marijuana-Booklet/, accessed 10/13/16
Further Reading

1. Marijuana: The Unbiased Truth About the World's Most Popular Weed by Kevin P. Hill, M.D.
2. Stoned: A Doctor's Case for Medical Marijuana by David Casarett, M.D.
3. Cannabis Pharmacy: The Practical Guide to Medical Marijuana by Michael Backes, Foreword by Andrew Weil, M.D.
4. Marijuana and Mental Health
5. Marijuana: A Short History
References


