




Medical Marijuana

AN EDUCATIONAL APPROACH: KNOW THE SCIENCE AND THE FACTS





The purpose of this presentation is to educate people about the science of medical marijuana and marijuana use.

WHAT DOES “MEDICAL MARIJUANA” MEAN?

➤ The term “medical marijuana” is generally used to refer to the whole unprocessed marijuana plant or its crude extracts, which are not recognized or approved as medicine by the U.S. Food and Drug Administration (FDA).




Why isn't the Marijuana Plant An Approved Medicine?

The FDA requires carefully conducted studies in large numbers of patients. There haven't been enough large scale clinical trials showing that the benefits outweigh the risks.



THE COMPONENTS OF MARIJUANA:

- The active chemicals in marijuana are called cannabinoids.
- The marijuana plant has over 100 cannabinoids.
- The two main cannabinoids of therapeutic interest are THC, delta-9-tetrahydrocannabinol, and CBD, cannabidiol.
 - THC is psychoactive and produces a high.
 - CBD is non-psychoactive.
 - THC and CBD may prove useful for treating a range of illnesses or symptoms.



Scientific study of cannabinoids has led to the development of two FDA-approved medications already, and is leading to the development of new pharmaceuticals that harness the therapeutic benefits of cannabinoids while minimizing or eliminating the harmful side effects (including the “high”) produced by eating or smoking marijuana leaves.

What Medications Contain Cannabinoids?

- An FDA-approved drug, in pill form, called **Dronabinol** (Marinol®) contains THC and is used to treat nausea caused by chemotherapy and wasting disease (extreme weight loss) caused by AIDS.
- Another FDA-approved drug called **Nabilone** (Cesamet®) contains a synthetic cannabinoid similar to THC and is used for the same purposes.
- A drug called **Sativex**®, which contains approximately equal parts THC and CBD, is currently approved in the UK and several European countries to treat spasticity caused by multiple sclerosis (MS), and it is now in Phase III clinical trials in the U.S. to establish its effectiveness and safety in treating cancer pain.



- National Institute of Drug Use: Is Marijuana Medicine? December 2014.



Medical Marijuana vs. FDA Approved Marijuana-Based Medicines

Legalized Medical Marijuana	FDA Approved Marijuana-Based Medicines
No Proven Safety No Proven Efficacy No Established Dose or Regimen No Randomized Controlled Trials No Recall System Doctors Recommend or Certify Dispensaries Sell Budtenders Dispense	Safe Effective Established Dose and Regimen Randomized Controlled Trials Recall System Doctors Prescribe Pharmacies Sell Pharmacists Dispense

***Marijuana-based medicines are never smoked.**

*"The Difference Between Medical Marijuana and Marijuana-Based Medicines: A Guide For Journalists and Policymakers,"
National Families in Action, January 2015.*


Comparison Of Forms of Cannabidiol (CBD) Oil	
<i>Charlotte's Web (Medical Marijuana)</i>	<i>Epidiolex® (Marijuana-Based Medicine)</i>
Hasn't been approved by the FDA	A marijuana-based medicine seeking FDA approval – <i>in clinical trials.</i>
May be contaminated with neurotoxic pesticides, which could be dangerous to the sensitive brains of patients with epilepsy	Extracted from marijuana grown without pesticides in controlled glasshouses by GW Pharmaceuticals in Great Britain
Has been legalized in 11 states for use with epilepsy, despite lack of FDA approval	Being administered in some states to children with epilepsy via FDA expanded access programs
High CBD; Low THC, but some concern that children may be exposed to enough TCH to cause intoxication.	98% pure, High CBD, zero to infinitesimal amounts of THC

"The Difference Between Medical Marijuana and Marijuana-Based Medicines: A Guide For Journalists and Policymakers," *National Families in Action*, January 2015.; "Everything You Need to Know About CBD." Smart Approaches to Marijuana..

Medical Marijuana Is Easily Diverted to Youth

- Teens who know somebody with a medical marijuana license are more likely to report that it is “fairly easy” or “very easy” to access marijuana than teens who don’t know someone with a medical marijuana license.
- 74% of Denver area teens in treatment said that they used somebody else’s medical marijuana an average of 50 times.

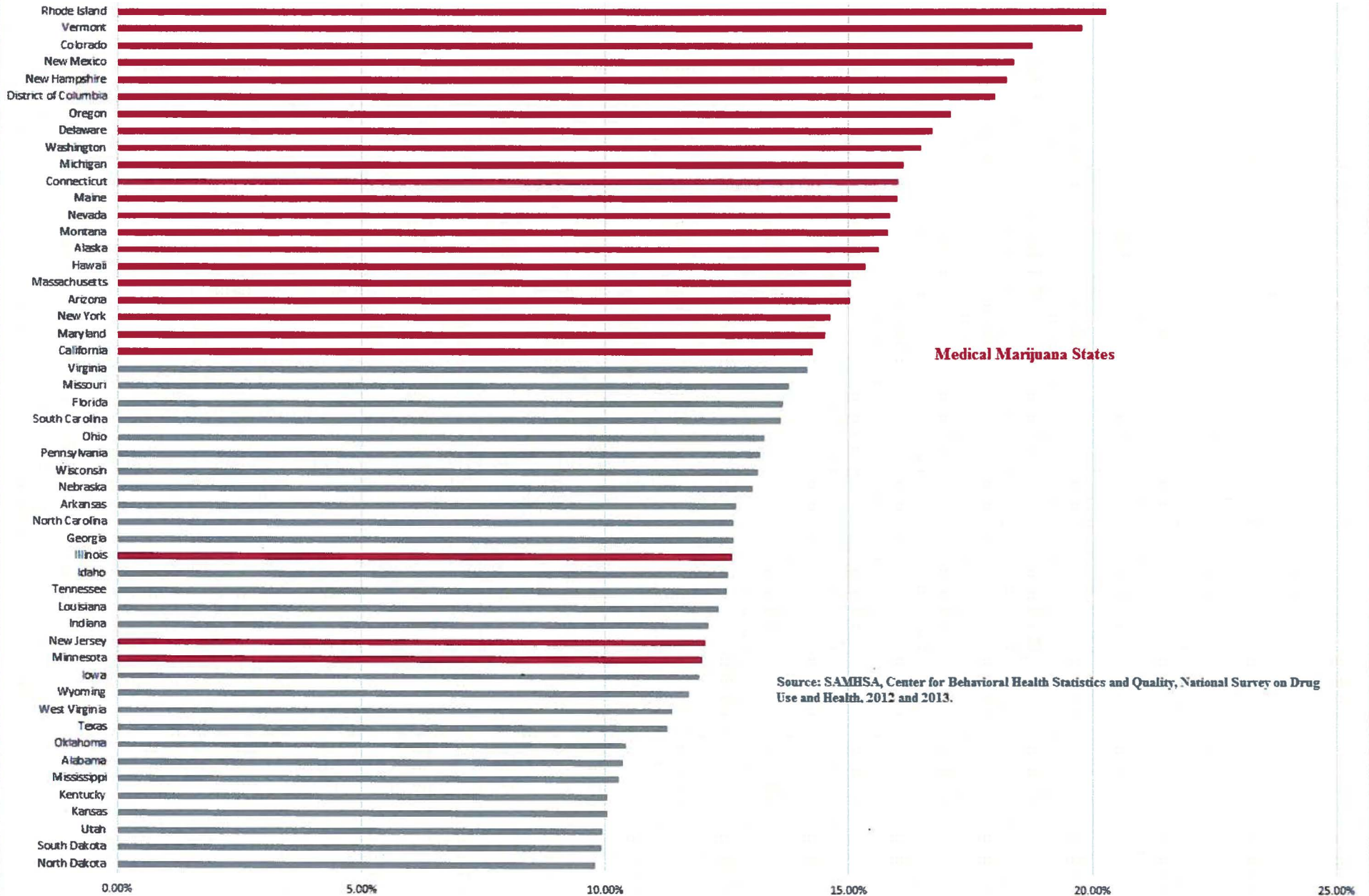
Thurstone, Christian, M.D. “Medical Marijuana Diversion and Associated Problems in Adolescent Substance Abuse Treatment.” *Drug and Alcohol Dependence* 118 (2011)489-492. Salamonsen-Sautel, Stacey et al., “Medical Marijuana Use Among Adolescents in Substance Abuse Treatment,” *Journal of American Academy of Child and Adolescent Psychiatry*, 2012, 51 (7): 694-702.



**“Medical marijuana”
states are clustered at the
top of the list in terms of
past month use, drug
addiction, and abuse
among 12 – 17 year olds.**

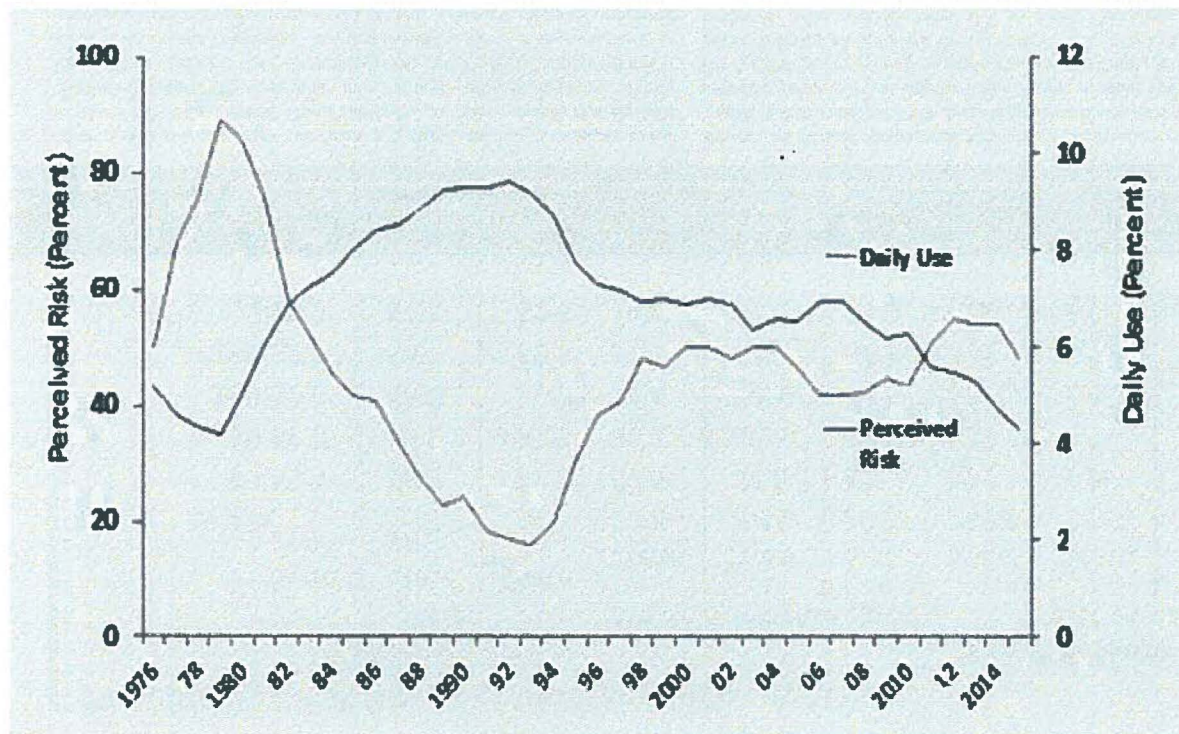
1 United States Department of Health and Human Services. Substance Abuse and Mental Health Services Administration. Office of Applied Studies. National Survey on Drug Use and Health, 2009.

Past Month Marijuana Use, Users Aged 12-17 (Percentage)



Medical marijuana debates and legislation promote the attitude among youth that marijuana is not harmful. These changing attitudes about the perceived risk of harm of use are associated with increased marijuana use.

Most high school seniors do not think that regular marijuana smoking is harmful.



Daily Marijuana Use vs. Perceived Risk of Regular Marijuana Use Among 12th Graders. Source: University of Michigan, 2014 Monitoring the Future Study.

Table 3.9-1

Perception of Risk (%Marking "moderate risk"or "great risk")

Grade	Try Marijuana Once or Twice			Smoke Marijuana Regularly			Smoke Marijuana once or twice a week		
	State 2009	State 2011	State 2013	State 2009	State 2011	State 2013	State 2009	State 2011	State 2013
6th	75.4	68.3	72.8	89.5	84.8	89.7	n/a	n/a	75.6
8th	64.0	65.0	66.8	87.1	87.5	88.3	n/a	n/a	74.8
10th	43.8	45.0	41.8	74.4	73.1	68.3	n/a	n/a	53.8
12th	33.7	34.7	33.5	67.1	67.1	58.0	n/a	n/a	45.2
All	53.2	52.8	52.5	79.0	77.9	75.1	n/a	n/a	61.8

3.9 Perceived Harmfulness of ATODs

When youth perceive that a substance is harmful, they are less likely to use it. The PAYS asked youth, "How much do you think people risk harming themselves (physically or in other ways) if they" smoked cigarettes heavily, binge drank regularly, used alcohol regularly, tried marijuana once or twice, smoked marijuana "regularly," smoked marijuana once or twice a week, or used prescription drugs not prescribed to them. Response categories were that the previously named substance categories placed them at "Moderate Risk" or "Great Risk." Results are reported in Table 3.9-1 and Figure 3.9-1.

Of the seven substance use categories, students perceived the greatest risk in smoking one or more packs of cigarettes per day (88.9% perceived moderate or great risk overall) and using prescription drugs not prescribed to them (85.9% perceived moderate or great risk overall). Of the seven categories, students perceived the least amount of risk in trying marijuana once or twice (52.5% of students perceived moderate or great risk) and smoking marijuana once or twice a week (61.8% of students perceived great or moderate risk).

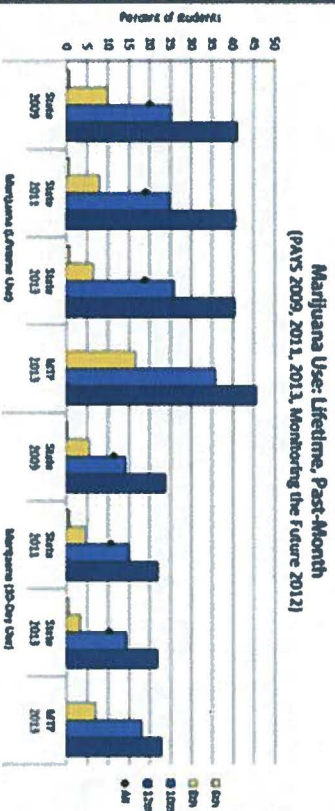
Perceptions of risks for most categories tended to peak in the 8th or 10th grades. Eighth graders indicated the highest perceived risk of heavy cigarette use, regular alcohol use, and regular binge drinking, while 10th graders indicated the highest perceived risk of using prescription drugs. In regard to all three perceived risks of marijuana use questions, 6th graders indicated the highest perceived risks, with perceived risk gradually decreasing as students aged. For example, 72.8% of 6th graders perceived moderate or great risk in trying marijuana once or twice. By the 12th grade, 52.5% of students perceived a risk in experimenting with marijuana use.

In comparing the 2011 and 2013 survey data, perceived harmfulness of heavy cigarette use increased 4.2% in the 6th grade, 1.6% in the 8th grade, and 1.4% for all grades combined. Perceived harmfulness of drinking alcohol regularly increased 2.1% to 11.6% in each grade, and 8.5% for all grades combined (from 63.5% in 2011 to 72.0% in 2013). There is only one year of data for perceived weekly binge drinking, regular marijuana use, and use of prescription drugs.

Table 3.3.1
Marijuana Use: Lifetime and Past-Month

Grade	Lifetime Use (%)				Past-Month Use (%)			
	2009	2011	2013	MKT 2013	2009	2011	2013	MKT 2013
6th	2.0	2.0	2.0	2.0	1.0	1.0	1.0	1.0
8th	4.0	4.0	4.0	4.0	2.0	2.0	2.0	2.0
10th	8.0	8.0	8.0	8.0	4.0	4.0	4.0	4.0
12th	12.0	12.0	12.0	12.0	6.0	6.0	6.0	6.0
All	4.0	4.0	4.0	4.0	3.0	3.0	3.0	3.0

Figure 3.3.1



3.3 Lifetime and 30-Day Gateway Drug Use: Marijuana

In the 2013 PAYS, Pennsylvania youth were asked to report if they had used marijuana in their lifetime or in the past 30-days. Records of students reporting that they used marijuana at least once in their lifetime or in the past month are reported in this section.

Lifetime Marijuana Use

The 2013 PAYS results presented in Table 3.3.1 show that 18.9% of students in grades 6, 8, 10, and 12 have used marijuana at least once in their lifetime. By grade, 0.8% of 6th graders, 6.4% of 8th graders, 25.8% of 10th graders, and 40.3% of 12th graders have used marijuana in their lifetime.


In comparison to data gathered through the national Monitoring the Future (MTF) Survey (see Figure 3.3.1), Pennsylvania youth in the 8th, 10th, and 12th grades indicated significantly lower lifetime marijuana use rates than youth in the same grades in the national sample. Pennsylvania rates were 10.1% lower than national rates in the 8th grade (6.4% in Pennsylvania, compared to 16.5% in the national sample), 10.0% lower than national rates in the 10th grade (25.8% in Pennsylvania, compared to 35.8% in the national sample), and 5.3% lower than national rates in the 12th grade (40.3% in Pennsylvania compared to 45.6% in the national sample). Since the 2011 survey, lifetime use did not significantly increase for all grades combined, but did slightly increase in the 10th grade (from 24.9% in 2011 to 25.8% in 2013).

Past Month Marijuana Use

The 2013 PAYS results presented in Table 3.3.1 and Figure 3.3.1 show that 10.3% of students in grades 6, 8, 10, and 12 have used marijuana at least once in the past 30 days. In looking at past month use rates by grade level, 0.8% of 6th graders, 3.3% of 8th graders, 14.8% of 10th graders, and 21.8% of 12th graders in Pennsylvania have used marijuana in the past 30 days.

As with lifetime marijuana use, in comparison to data gathered through the national MTF Survey (see Figure 3.3.1), Pennsylvania youth in the 8th, 10th, and 12th grades indicated lower past month marijuana use rates than youth in the same grades in the national sample. Pennsylvania rates were 3.7% lower than national rates in the 8th grade (3.3% in Pennsylvania, compared to 7.0% in the national sample), 3.6% lower than national rates in the 10th grade (14.8% in Pennsylvania, compared to 18.4% in the national sample), and 0.9% lower than national rates in the 12th grade (21.8% in Pennsylvania compared to 22.7% in the national sample).

For data regarding lifetime and 30-day marijuana use by county and grade, please refer to the PAYS Portal at www.PAYS.state.pa.us or the PAYS Web Tool at www.beth-harrison.com/PAYSWebTool.



Marijuana is particularly harmful to the developing brains of young people, causing long-term impairment in cognitive development. Adolescents under the age of 18 who use marijuana more than once a week may lose up to 8 IQ points, which may put them at a disadvantage when compared to their same-age peers for years to come. The lower IQ may affect future education level, income, health, and lifespan.

***National Institute of Drug Abuse, Is Marijuana Medicine?, December 2014; Winter, Michael, Duke Today
Duke University, "Adolescent Pot Use Leaves Lasting Mental Deficits," August 27, 2012***

Marijuana's Effects on the Brain

HYPOTHALAMUS
Controls appetite,
hormonal levels and
sexual behavior

BASAL GANGLIA
Involved in motor
control and
planning, as well as
the initiation and
termination of action

VENTRAL STRIATUM
Involved in the prediction
and feeling of reward

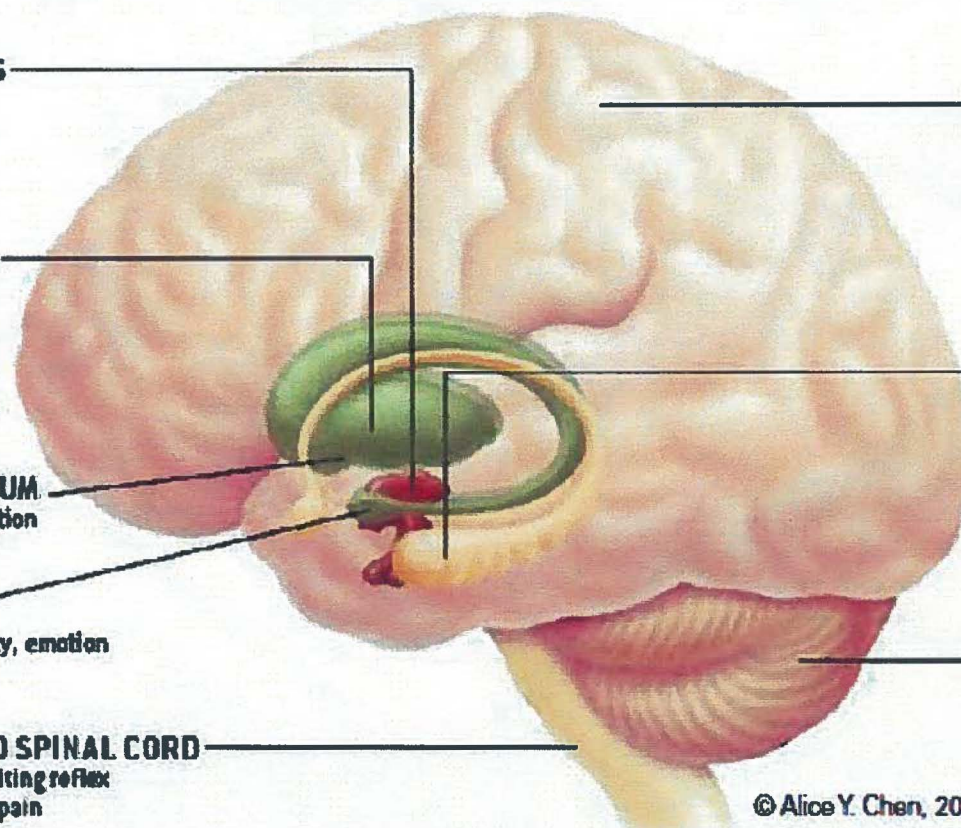
AMYGDALA
Responsible for anxiety, emotion
and fear

BRAIN STEM AND SPINAL CORD
Important in the vomiting reflex
and the sensation of pain

NEOCORTEX
Responsible for higher
cognitive functions and
the integration of
sensory information

HIPPOCAMPUS
Important for memory
and the learning of
facts, sequences and
places

CEREBELLUM
Center for motor control
and coordination



© Alice Y. Chen, 2004. Adapted from *Scientific American*.

When marijuana is smoked, its active ingredient, THC, travels throughout the body, including the brain, to produce its many effects. THC attaches to sites called cannabinoid receptors on nerve cells in the brain, affecting the way those cells work. Cannabinoid receptors are abundant in parts of the brain that regulate movement, coordination, learning and memory, higher cognitive functions such as judgment, and pleasure.

Marijuana Affects Academic Performance ↗





WHY?

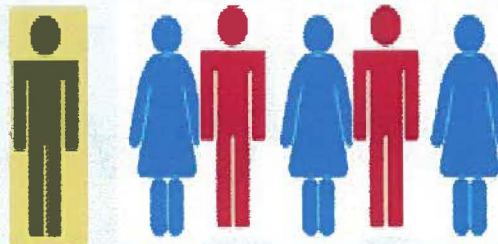
- Because marijuana negatively affects motivation, memory, AND learning!
- Youth with an average grade of D or less were four times as likely to have used marijuana in the past year than youth with an average grade of A.

National Institute on Drug Abuse: Marijuana: Facts Parents Need To Know. March 2014.
<http://www.drugabuse.gov/publications/marijuana-facts-parents-need-to-know/talking-to-your-kids-communicating-risks/>


Office of Applied Studies, Substance Abuse and Mental Health Services Administration, SAMHSA's National Household Survey on Drug Abuse Report, Marijuana Use Among Youth, July 19, 2002.

1 in 6 teens become addicted

1 in 10 adults and **1 in 6 adolescents** who try marijuana will become addicted to it.



National Institute on Drug Abuse: Marijuana: Facts Parents Need To Know., March 2014.
<http://www.drugabuse.gov/publications/marijuana-facts-parents-need-to-know/talking-to-your-kids-communicating-risks>



Among youth receiving substance abuse treatment, marijuana accounts for the largest percentage of admissions: 74 percent among those aged 12–14, and 76 percent among those 15–17.

National Institute on Drug Abuse: Marijuana: Facts Parents Need To Know., March 2014.
<http://www.drugabuse.gov/publications/marijuana-facts-parents-need-to-know/talking-to-your-kids-communicating-risks>



RISKS OF MARIJUANA FOR ALL USERS

- ***Impairs short-term memory***
- ***Alters judgment and decision-making***
- ***Affects mood – causes severe anxiety, paranoia, and even psychosis with high doses***
- ***Reduces motor coordination and slows reaction time, making driving difficult.***
- ***Use during pregnancy may be associated with neurological problems in babies and impaired school performance in later childhood.***
- ***Can cause or worsen respiratory problems.***



Marijuana Affects Public Safety

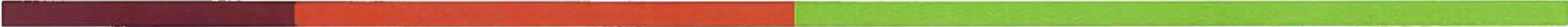




Why?

Because marijuana is the most prevalent illegal drug detected in impaired drivers, fatally injured drivers, and motor vehicle crash victims.¹

¹ National Highway Traffic Safety Administration. Drug Involvement of Fatally Injured Drivers. U.S. Department of Transportation Report No. DOT HS 811 415. Washington, DC: National Highway Traffic Safety Administration, 2010.



In a study of seriously injured drivers admitted to a Level-1 shock trauma center, more than a quarter of all drivers tested positive for marijuana.¹


¹ Romano, E, and Voas, R. B.; Journal of Studies on Alcohol and Drugs, Drug and Alcohol Involvement in Four Types of Fatal Crashes, June 2011.

Marijuana Affects Jobs

WHY?

- Because more than 6,000 companies nationwide and scores of industries and professions require a pre-employment drug test.

The Definitive List of Companies That Drug Test, March 2010. Available: www.testclear.com




Because 6% of high school seniors smoke marijuana every day¹, rendering them virtually unemployable.

¹ Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. Monitoring the Future national survey results on drug use, 2010. Volume I: Secondary school students. Ann Arbor: Institute for Social Research, The University of Michigan.
Available: <http://www.monitoringthefuture.org/data/10data.html#2010data-drugs>

Marijuana and Mental Illness

- Although scientists do not yet know whether the use of marijuana causes chronic mental illness, high doses can induce an acute psychosis (disturbed perceptions and thoughts, including paranoia) and/or panic attacks. In people who already have schizophrenia, marijuana use can worsen psychotic symptoms, and evidence to date suggests a link between early marijuana use and an increased risk of psychosis among those with a preexisting vulnerability for the disease.

- National Institute on Drug Abuse: Marijuana: Facts Parents Need To Know. NIH Publication NO 10-4036, p.7. March 2011.



Associations have also been found between marijuana use and other mental health problems, such as depression, anxiety, suicidal thoughts among adolescents, and personality disturbances, including a lack of motivation to engage in typically rewarding activities.


NIDA: Drug Facts: Marijuana, January 2014.

<http://www.drugabuse.gov/publications/drugfacts/marijuana>

Marijuana Can Make Post Traumatic Distress Symptoms Worse

- **Medical marijuana can exacerbate symptoms. Researchers found that veterans using marijuana were associated with having HIGHER levels of PTSD symptoms, including PTSD avoidance/numbing and hyper arousal symptoms.**
- **Research shows that Marijuana use can cause increased paranoia, anxiety, and psychosis in some people**

➤ Bonn-Miller, M.O., Boden, M.T., Vujanovic, A.A., & Drecher, K.D. (2011, December 19). "Prospective Investigation of the Impact of Cannabis Use Disorders on Posttraumatic Stress Disorder Symptoms Among Veterans in Residential Treatment." *Psychological Trauma: Theory, Research, Practice, and Policy*. This study was done with the National Center for PTSD and Center for Health Care Evaluation at the Palo Alto VA Health Care Center.



LESSONS LEARNED FROM COLORADO, PRE-RECREATIONAL

LESSONS LEARNED FROM COLORADO

Increased teen use

Marijuana use among Colorado teens is currently:

- **fifth** highest in the nation
- 50% above national average



Colorado

10.7%

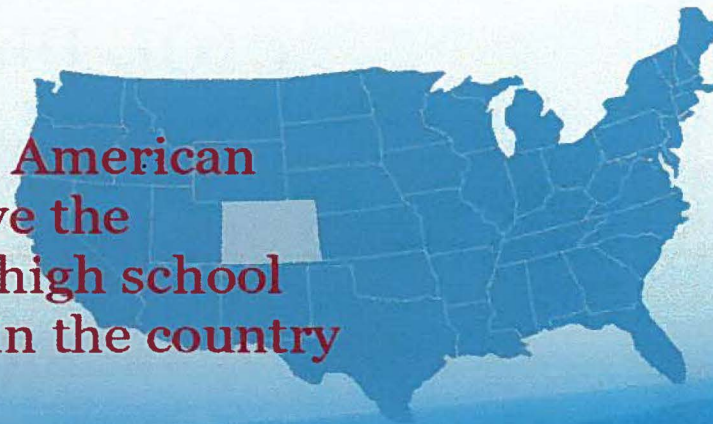
7.6%

National average

NSDUH, 2013

Denver high schools

- 29% of Denver high school students used marijuana in the last month
- If Denver were an American state, it would have the **HIGHEST** public high school current use rates in the country



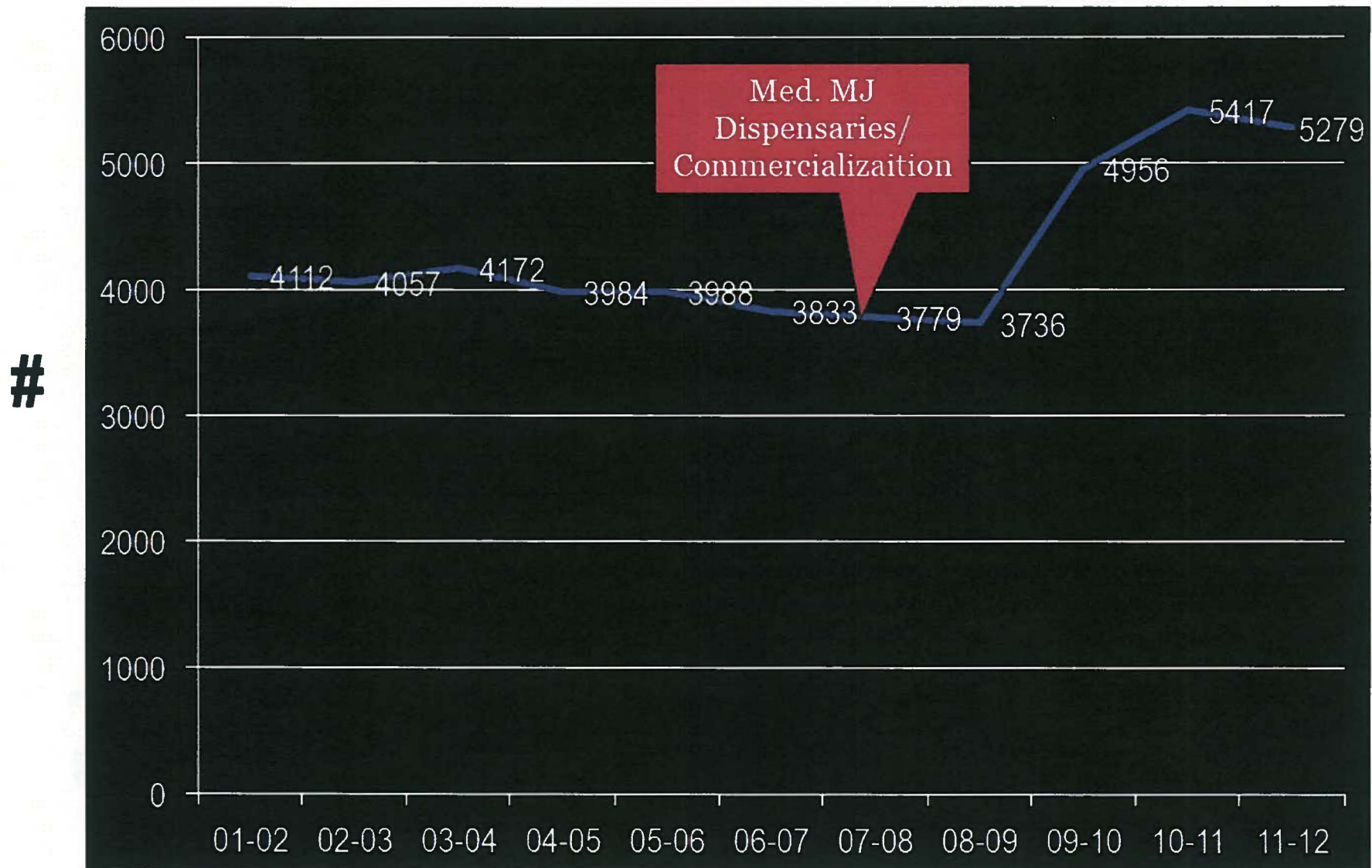
Healthy Kids Colorado, 2012

Colorado post-2009

- Passed medical marijuana in 2001
- But no dispensaries until the mid-2000s
- Between 2006 and 2012, medical marijuana cardholders rose from **1,000 to over 108,000**
- The number of dispensaries rose from **0 to 532**



Drug-Related Suspensions/Expulsions - Colorado



Source: Colorado Department of Education

Office of Drop-out Prevention and Engagement, August, 2013.



STATEMENTS FROM SOCIETIES AND ORGANIZATIONS



Epilepsy Experts Call for More Research Into Medical Marijuana

Dr. Elson So, President of the American Epilepsy Society recently stated:

“Little is known about the long term effects of using marijuana in infants and children on memory, learning and behavior.

This is of particular concern because of both clinical data in adolescents and adults and laboratory data in animals demonstrating potential negative effects of marijuana and its derivatives on their critical neurological functions.

Such safety concerns coupled with a lack of evidence of efficacy in controlled studies result in a risk/benefit ratio that does not yet support use of marijuana for treatment of seizures.”



The American Academy of Pediatrics (AAP):

“Any change in the legal status of marijuana, even if limited to adults, could affect the prevalence of use among adolescents. While it supports scientific research on the possible medical use of cannabinoids as opposed to smoked marijuana, it opposes the legalization of marijuana.”

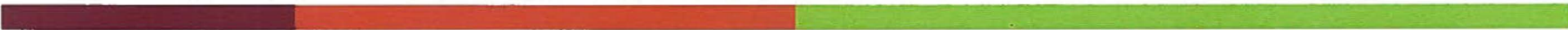
Committee on Substance Abuse and Committee on Adolescence. “Legalization of Marijuana: Potential Impact on Youth.” (*Pediatrics* Vol. 113, No. 6 (June 6, 2004): 1825-1826. See also, Joffe, Alain, MD, MPH, and Yancy, Samuel, MD. “Legalization of Marijuana: Potential Impact on Youth.” *Pediatrics* Vol. 113, No. 6 (June 6, 2004):e632-e638h.)



American Glaucoma Foundation:

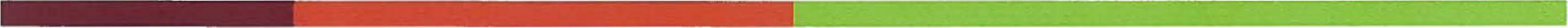
“Marijuana, or its components administered systemically, cannot be recommended without a long term trial which evaluates the health of the optic nerve,” said the editorial. “Although marijuana can lower IOP, its side effects and short duration of action, coupled with a lack of evidence that its use alters the course of glaucoma, preclude recommending this drug in any form for the treatment of glaucoma at the present time.”

Aug. 10, 2009 "Position Statement on Marijuana and the Treatment of Glaucoma,"
Available on its website and confirmed as current position on Apr. 7, 2014.




The Pennsylvania Association of County Drug and Alcohol Administrators (PACDAA): PACDAA is extremely concerned about the public health impact associated with any change in current state or federal laws governing marijuana. Simply put, any increase in access to marijuana will lead to expanded use by all age groups, and will in turn lead to an increase in negative consequences for individuals, families, and communities as a result of this expanded use.

“Position Paper Regarding Legalization of Marijuana for Medicinal Purposes,” Pennsylvania Association of County Drug and Alcohol Administrators, November, 2014.



The American Medical Association (AMA) has called for more research on the subject, with the caveat that this “should not be viewed as an endorsement of state-based medical cannabis programs, the legalization of marijuana, or that scientific evidence on the therapeutic use of cannabis meets the current standards for a prescription drug product.” Furthermore, AMA believes (1) cannabis is a dangerous drug and as such is a public health concern; (2) sale of cannabis should not be legalized.

"AMA Policy: Medical Marijuana," (10 KB) , Nov. 10, 2009; Reaffirmed November, 2013.



“The FDA medication approval process is a very rigorous process that helps ensure effectiveness, standardization of dosage and administration, and safety. Declaring marijuana a medication without due process is, in my opinion, to practice a poor and unsafe standard of medicine.”

Dr. Neil Capretto, Medical Director of Gateway Rehabilitation,
Aliquippa , PA



American Cancer Society says:

"While it shows promise for controlling cancer pain among some patients, there is still concern that marijuana may cause toxic side effects in some people and that the benefits of THC must be carefully weighed against its potential risks. There is no available scientific evidence from controlled studies in humans that cannabinoids can cure or treat cancer."^[35]



American Society of Addiction Medicine:


Marijuana should be subject to the same standards that are applicable to other prescription medications, and these products should not be distributed or otherwise provided to patients unless and until such products or devices have received marketing approval from the Food and Drug Administration.



The American Psychiatric Association (APA)

States:

(1) There is no current scientific evidence that marijuana is in any way beneficial for the treatment of any psychiatric disorder. Current evidence supports...a strong association of cannabis use with the onset of psychiatric disorders. (2) Further research on the use of cannabis-derived substances as medicine should be encouraged and facilitated by the federal government. The adverse effects of marijuana...must be simultaneously studied. (3) No medication approved by the FDA is smoked.



This presentation was compiled by
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Southeast Pennsylvania Regional
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