

MARIJUANA IN GEORGIA: FACTS AND MYTHS

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DRUGS

Doing nothing has never been so amazing.

Marijuana Facts



- Green, Brown or gray dried, shredded leaves, stems, seeds, and flowers
- What is the most potent part of the plant?
- **Flower of the female plant**
- What is the mind-altering active chemical in Marijuana?
- **THC (Delta-9-tetrahydrocannabinol)**
- How many active chemicals in MJ?
- **400 other chemicals**



Marijuana Facts

What is the most commonly used illicit drug in USA?

Marijuana

What is the most commonly used drug in the world?

Marijuana

How many current illicit drug users use MJ?

76% (5.7 Million Americans)

How many current illicit drug users ONLY use MJ?

59%



“Medical Marijuana”

- How many states allow “medical” marijuana?
- 50 states it is a prescription medication called Marinol






Marinol, a prescription drug used to treat nausea for chemotherapy, is chemically synthesized THC.

The warning label explains that the **THC may cause changes in mood, decrements in cognitive performance and memory, a decreased ability to control drives and impulses.**



“Medical Marijuana”

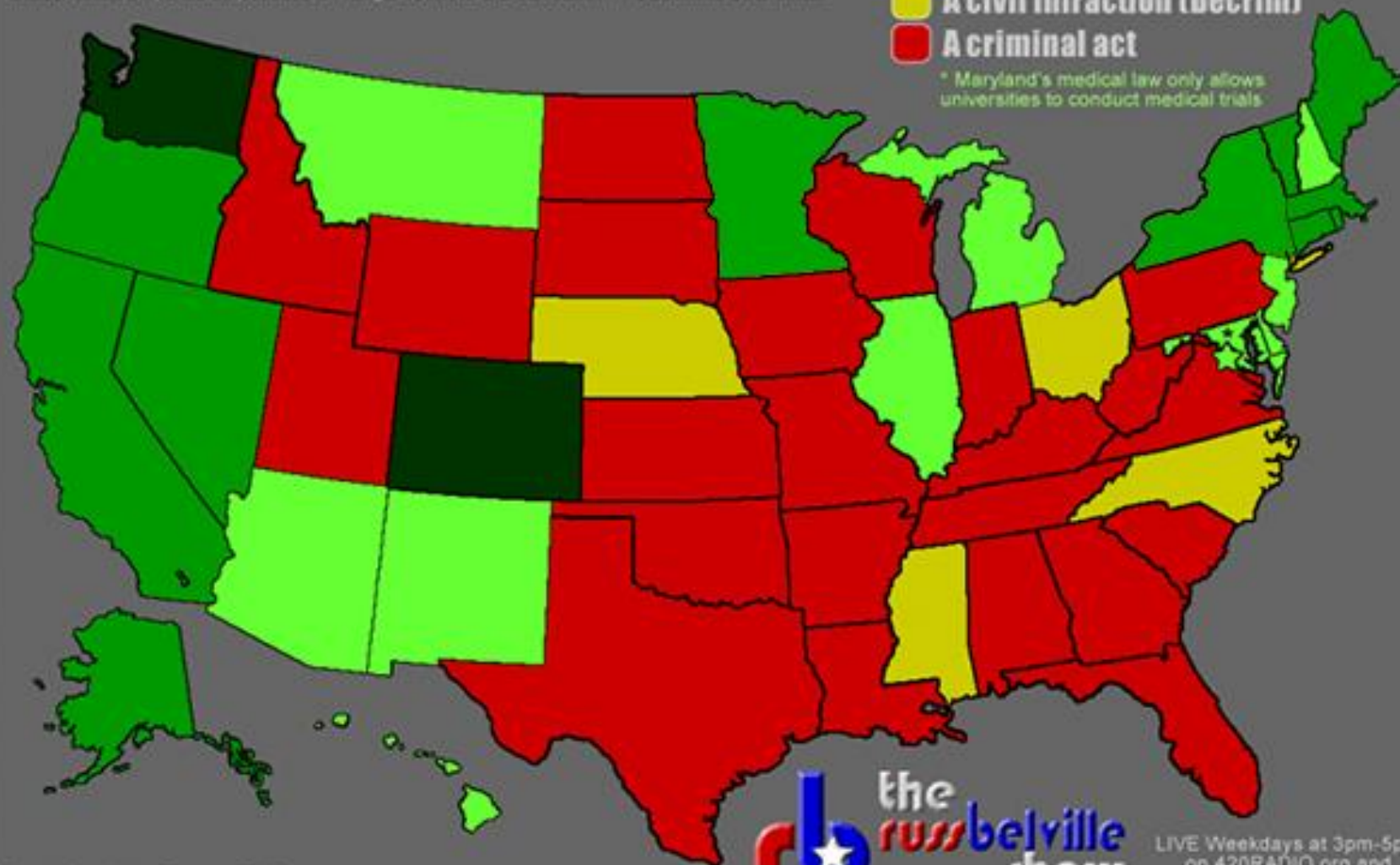
- How many states allow the smoking of “medical” marijuana?
 - **Thirty six (not Georgia)**
- 

In 2013 in the United States of America, possession of 1 ounce* of marijuana is

*Limits on medical marijuana possession range from 1-24 ounces in 20 medical marijuana states; limits on personal possession range from 0.5-3.5 ounces in 17 decriminalized states

- Legal for Adults & for Medical Use
- Allowed for Medical Use & Decrim
- Allowed for Medical Use Only
- A civil infraction (Decrim)
- A criminal act

* Maryland's medical law only allows universities to conduct medical trials



Map updated as of August 2013

the russelville show

LIVE Weekdays at 3pm-5pm
on 420RADIO.org and
RadicalRuss.com

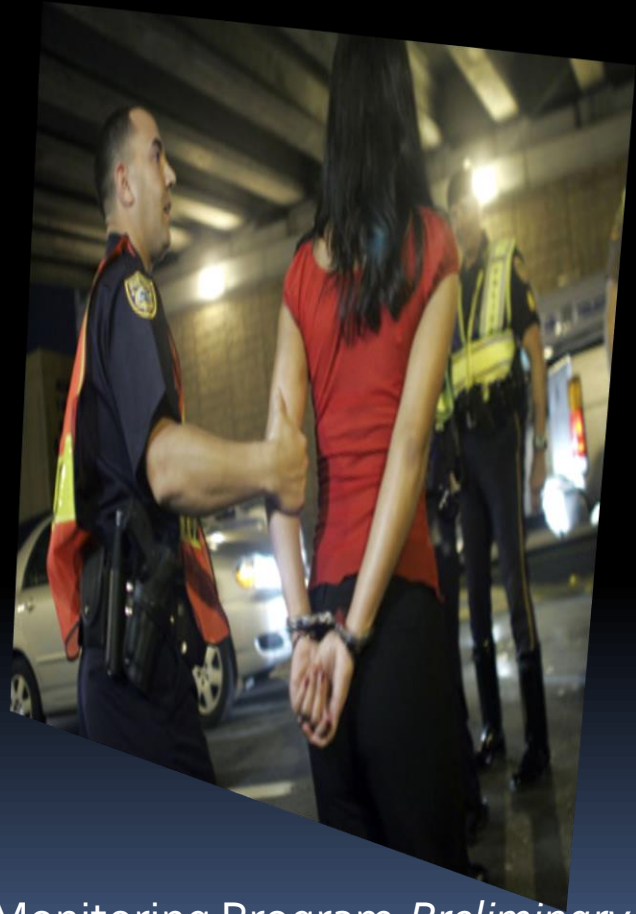
Legal Consequences of Marijuana Use

- If you are convicted of possession of marijuana, you will lose your federal financial aid?
True
- In some states, employers are automatically informed if some is caught with Marijuana?
True
- 1/2 of the States suspend the driver's license of anyone convicted of marijuana possession?
True



National Institute of Justice's Arrestee Drug Abuse Monitoring (ADAM)

- Adults Arrestees testing positive for various drugs
- **41 % of adult male** arrestees and **27 % of adult female** arrestees tested positive for marijuana



National Institute of Justice, Arrestee Drug Abuse Monitoring Program. *Preliminary Data on Drug Use and Related Matters Among Adult Arrestees & Juvenile Detainees*, 2002.

Washington, DC: U.S. Department of Justice, 2002

National Institute of Justice's Arrestee Drug Abuse Monitoring (ADAM)

- **57% of juvenile male and 32 % of juvenile female arrestees tested positive for Marijuana**

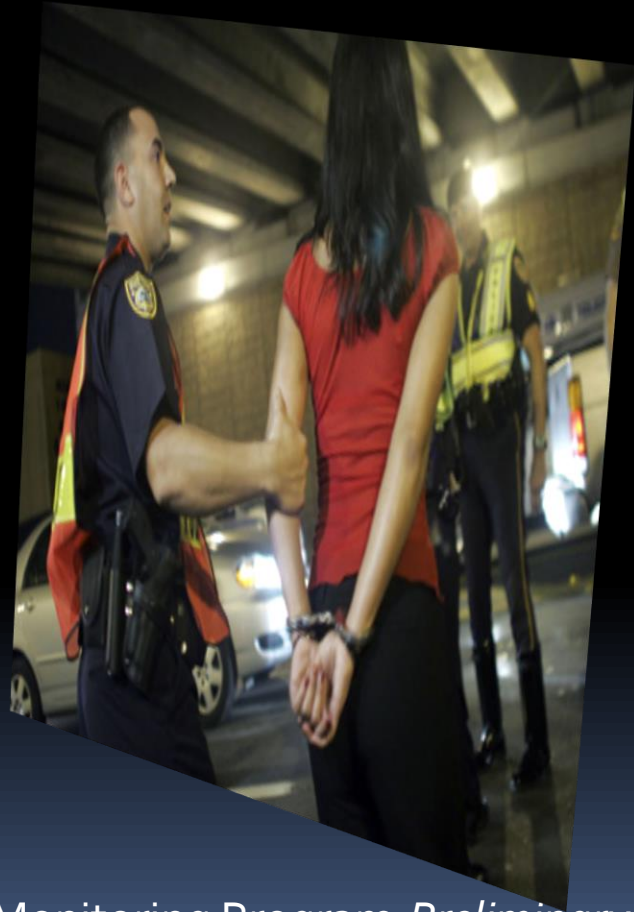


National Institute of Justice, Arrestee Drug Abuse Monitoring Program. Preliminary *Data on Drug Use and Related Matters Among Adult Arrestees & Juvenile Detainees*, 2002.

Washington, DC: U.S. Department of Justice, 2002

National Institute of Justice's Arrestee Drug Abuse Monitoring (ADAM II)

- Marijuana remained the most commonly detected drug in urine testing, from **34 % of ADAM II arrestees testing positive in Atlanta** to 59 % in Sacramento.
- Those who obtained marijuana in the prior 30 days reported little difficulty obtaining the drug, indicating an overall high availability of the drug in all sites



National Institute of Justice, Arrestee Drug Abuse Monitoring Program. *Preliminary Data on Drug Use and Related Matters Among Adult Arrestees & Juvenile Detainees, 2014.*

Washington, DC: U.S. Department of Justice, 2014

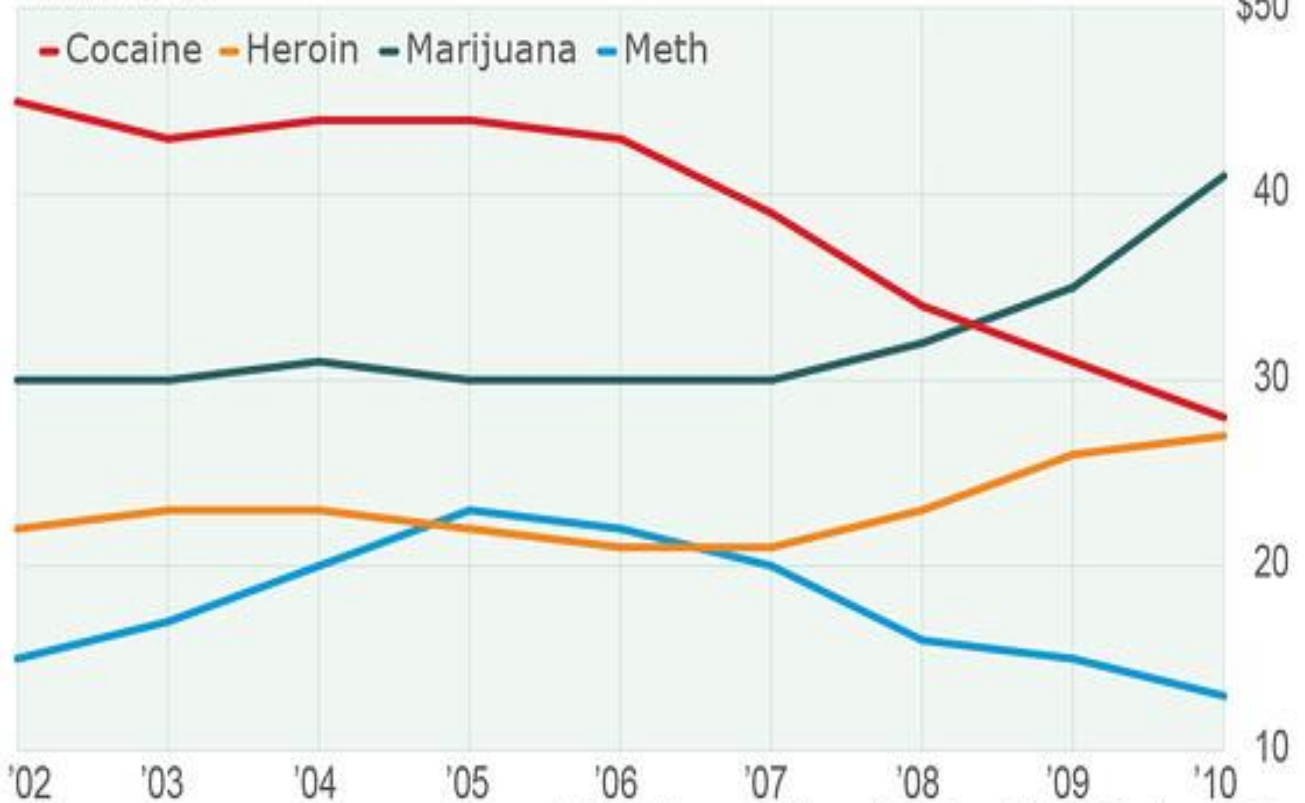
ADAM II Data: 2013 Arrests

- Arrestees also reported little difficulty obtaining marijuana, based on the percentage reporting that at some point in the previous 30 days they had the funds, went to purchase marijuana, but could not get it(a failed buy).
- Arrestees in **Denver** reported the least difficulty, with only **17 %** of arrestees reporting a failed buy in the prior 30 days; the percentage of arrestees reporting failed buys in the other four sites ranged from **24% in Atlanta** to 40 percent in Chicago

*Cocaine and Meth are down
THC and Heroin are up*

What Americans spend on illicit drugs

In billions



Source: White House Office of National Drug Control Policy,
prepared by RAND Drug Policy Research Center

Drug Abuse Warning Network (DAWN)

- DAWN data show there was a **59 % increase in marijuana-related emergency** department visits between 2006 (290,565) and 2010 (461,028).
- Marijuana was second only to cocaine for illicit drug-related emergency department visits in 2010.
- **About 15 % of these admissions were patients between the ages of 12 and 17**
- Almost 2/3 of the ER admissions were male



Substance Abuse and Mental Health Services Administration, Office of Applied Studies. *Emergency Department Trends from DAWN: Final Estimates 1995-2002*. DAWN Series D-24; DHHS Pub. No. (SMA) 03-3780. Rockville, MD: SAMHSA, 2003.



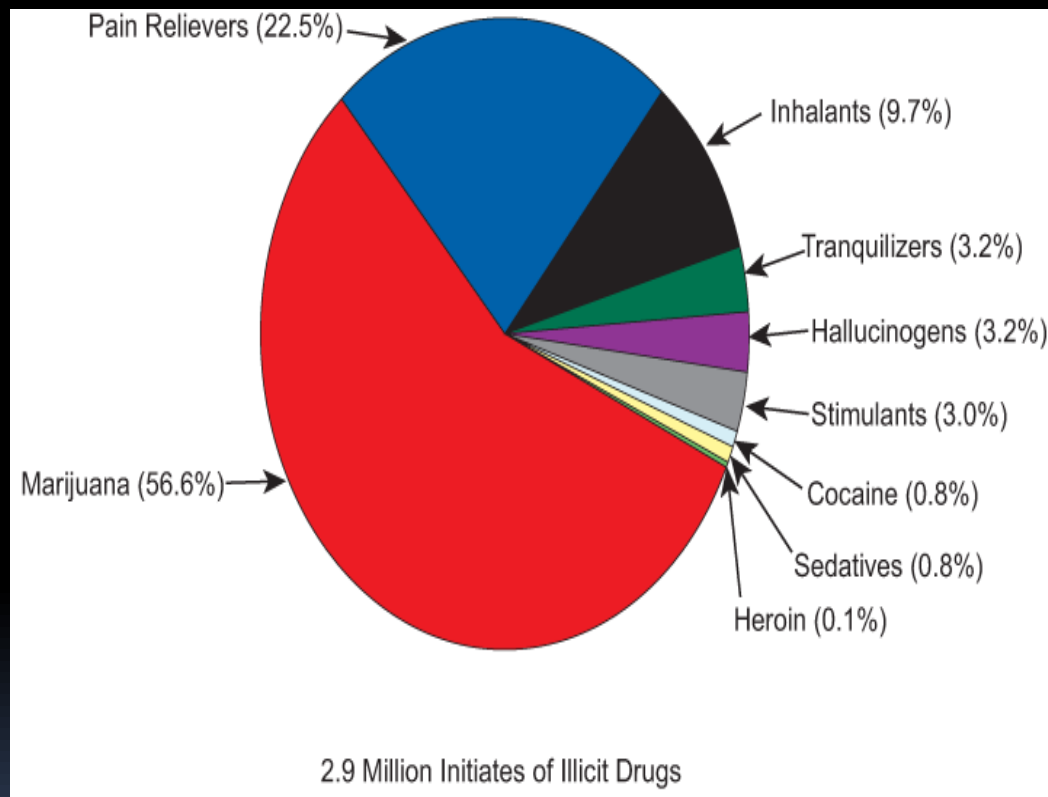
NIDA's Community Epidemiology Work Group (CEWG)

- **Network of researcher that tracks trends in the nature and patterns of drug use in major USA cities**
- **Marijuana is frequently combined with other drugs, such as crack cocaine, PCP, formaldehyde, and codeine cough syrup**
- **Often the user is unaware of it.**
- **Risks associated with MJ use may be compounded by the risks of added drugs**

Experimentation starts Early

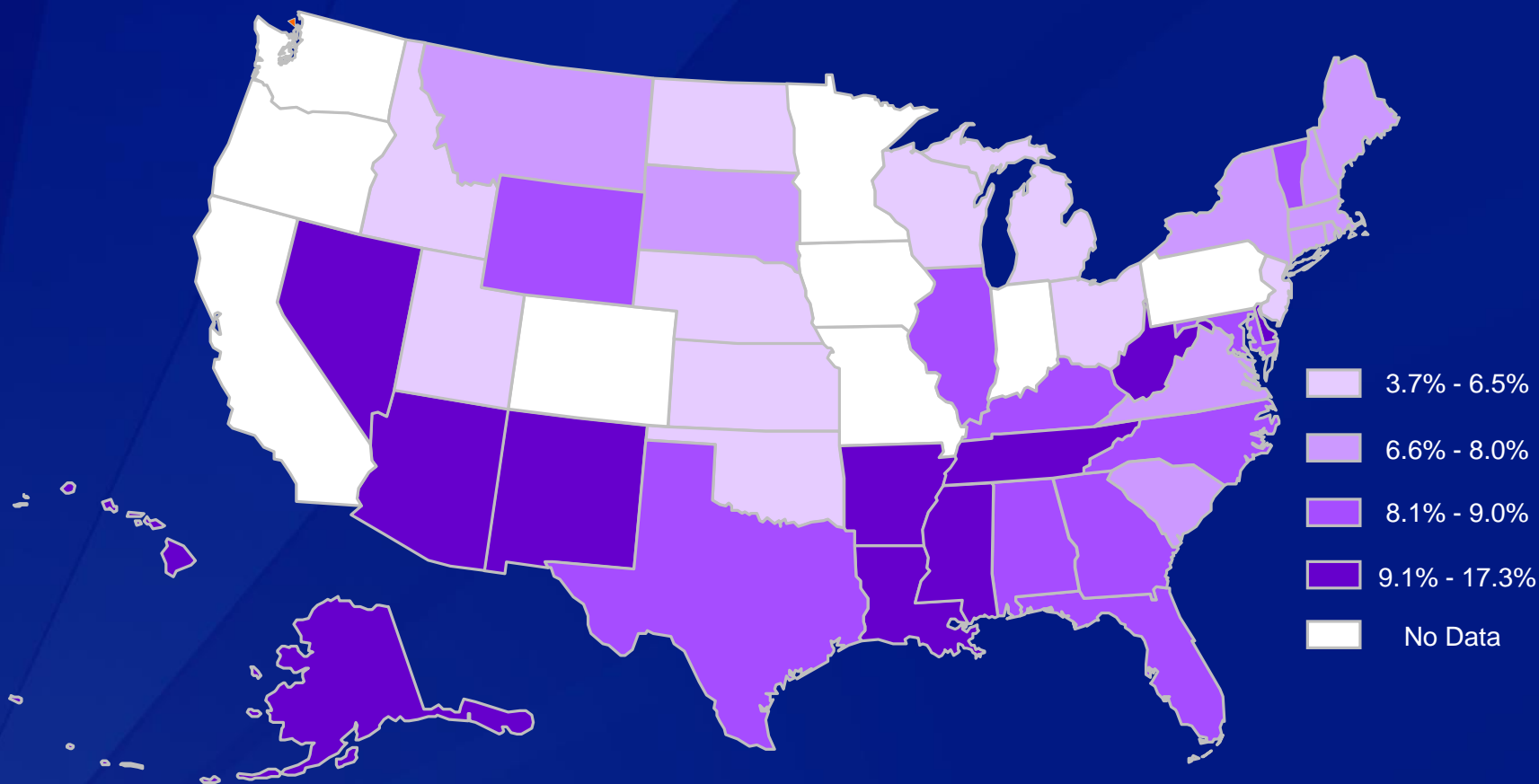
- Many young people have their first exposure to substances before the age of 10.
- Most individuals begin by using alcohol, tobacco and marijuana in adolescence

Specific Drug Used When **Initiating** Illicit Drug Use among Past Year Aged 12 or Older: **2008**



National Survey on Drug Use and Health: 2008 National Findings
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES SAMHSA Office of Applied Studies

Percentage of High School Students Who Tried Marijuana Before Age 13 Years*



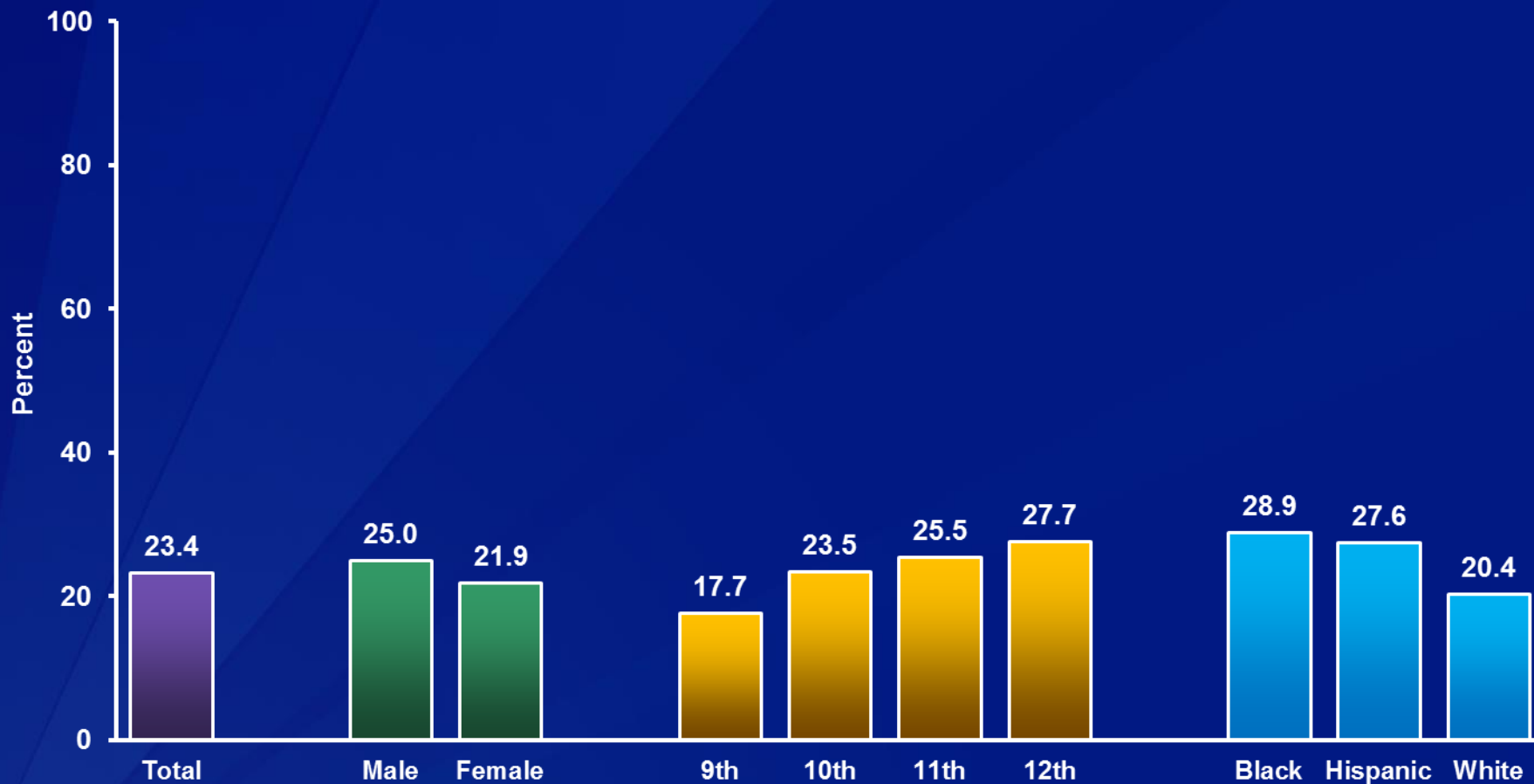
*For the first time.

- 29% of Denver high school students reported using marijuana in the last 30 days. If Denver were an American state, it would have the highest public high school current use rates of any state in the country.

- *Source: Healthy Kids Colorado, 2012.*



Percentage of High School Students Who Currently Used Marijuana,* by Sex,† Grade,† and Race/Ethnicity,† 2013

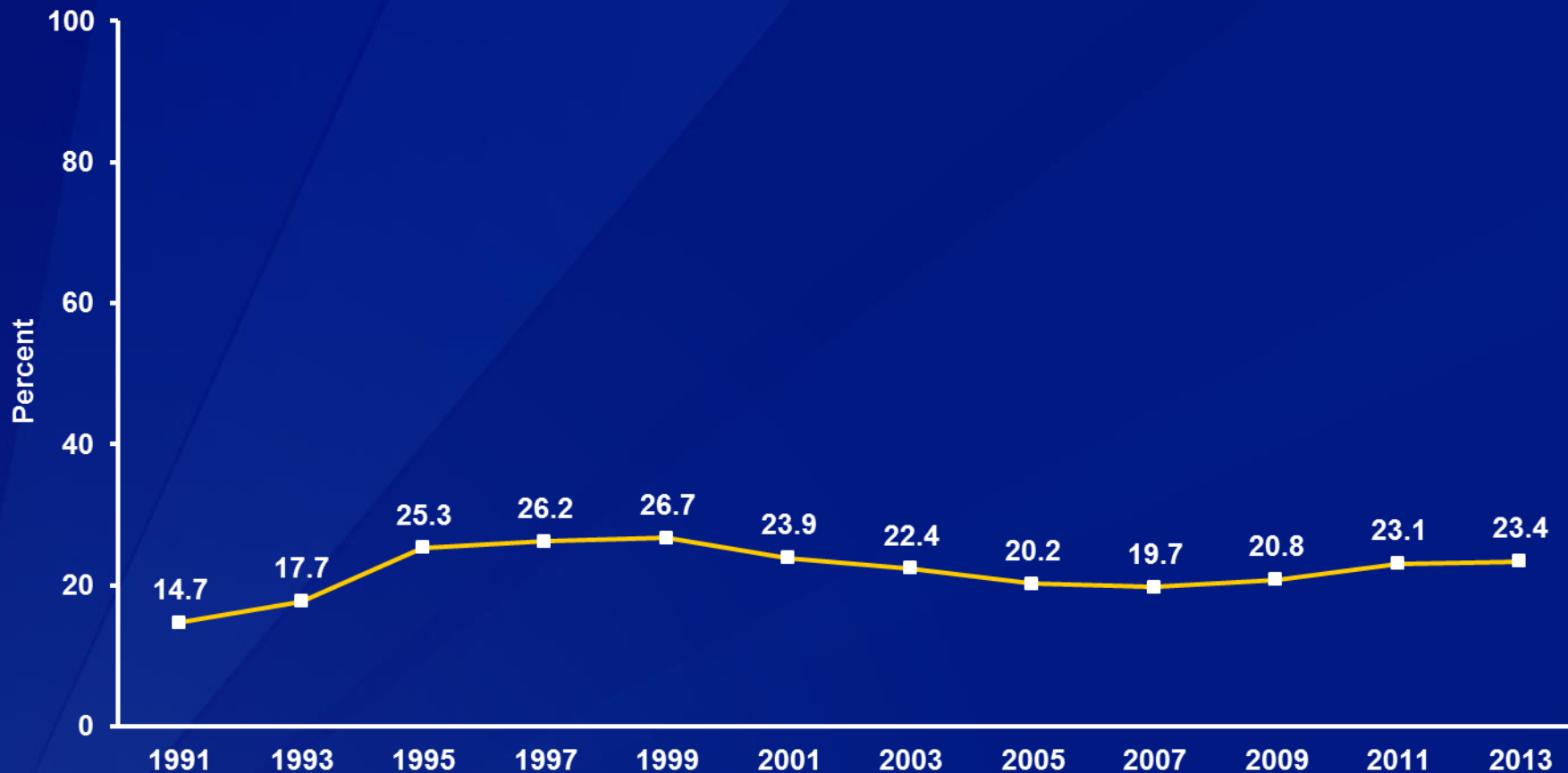


*One or more times during the 30 days before the survey.

†M > F; 10 > 9, 11 > 9, 12 > 9, 12 > 10; B > W, H > W (Based on t-test analysis, $p < 0.05$.)

Black and White races are non-Hispanic.

Percentage of High School Students Who Currently Used Marijuana,* 1991-2013†



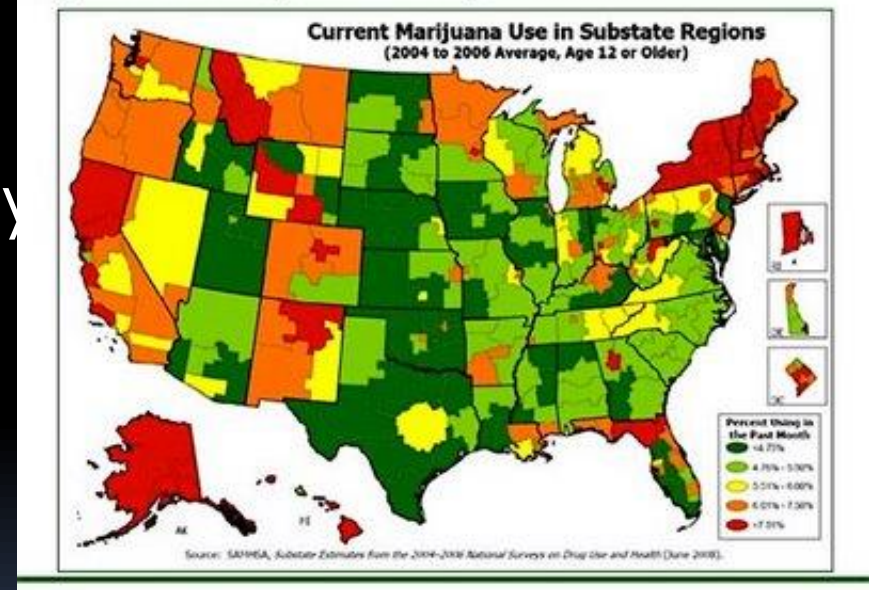
*One or more times during the 30 days before the survey.

†Increased 1991-2013, increased 1991-1995, decreased 1995-2013 [Based on linear and quadratic trend analyses using logistic regression models controlling for sex, race/ethnicity, and grade ($p < 0.05$). Significant linear trends (if present) across all available years are described first followed by linear changes in each segment of significant quadratic trends (if present).]

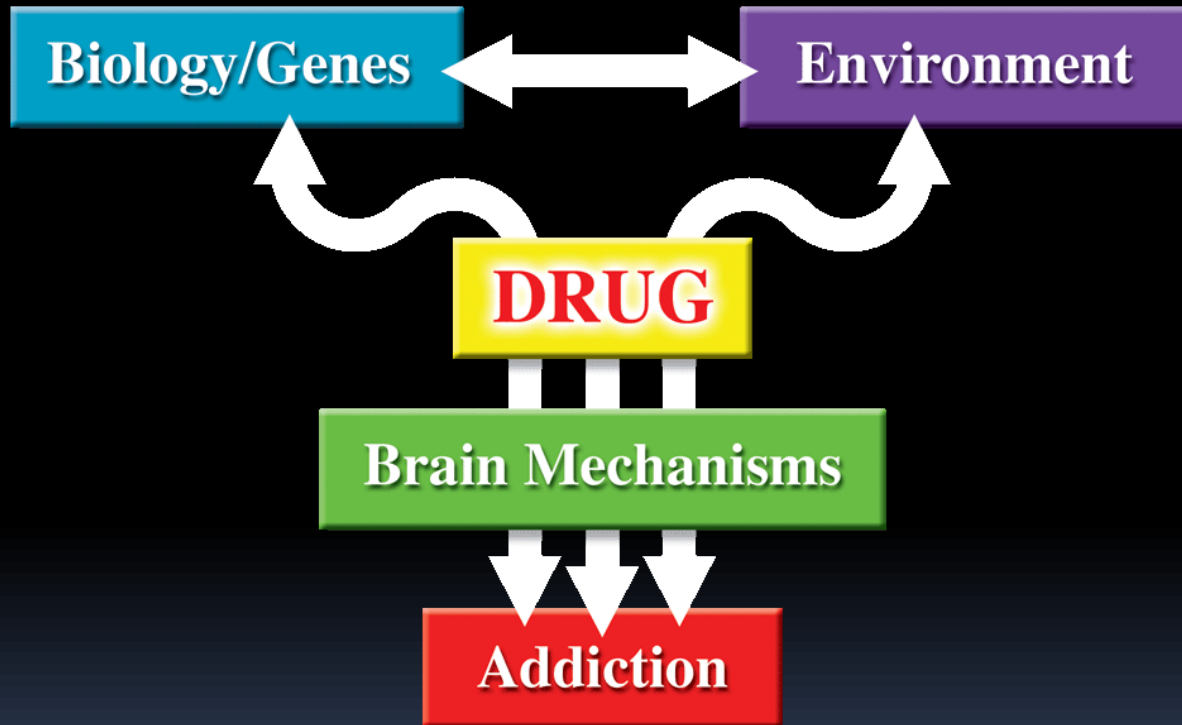
Is Marijuana Addictive?

- 15% of people entering drug treatment programs report THC as their primary drug of choice
- Withdrawal symptoms include irritability, difficulty sleeping and anxiety.
- Also include increased aggression
- The symptoms begin approximately 1 week after discontinuation

Marijuana Use Rates Vary Across the Country

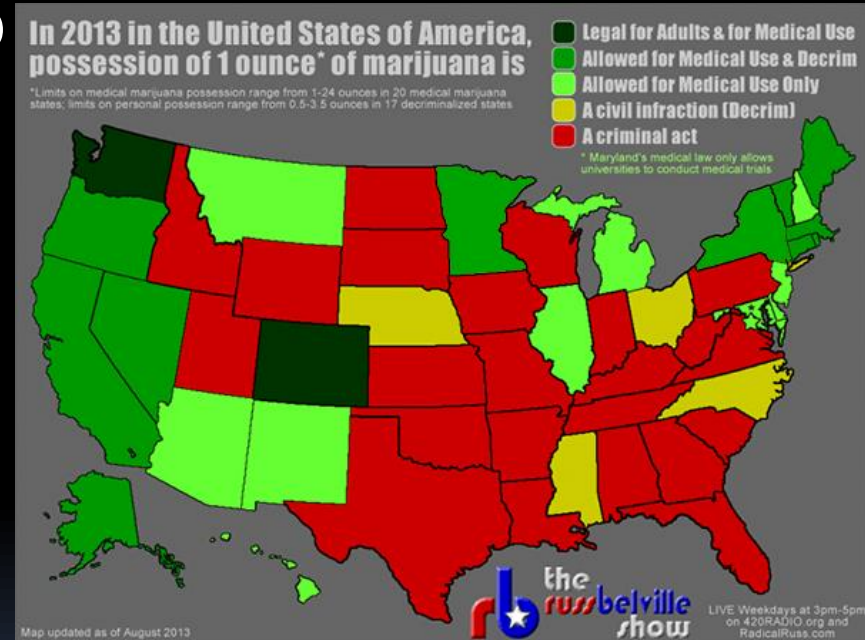


Addiction Involves Multiple Factors



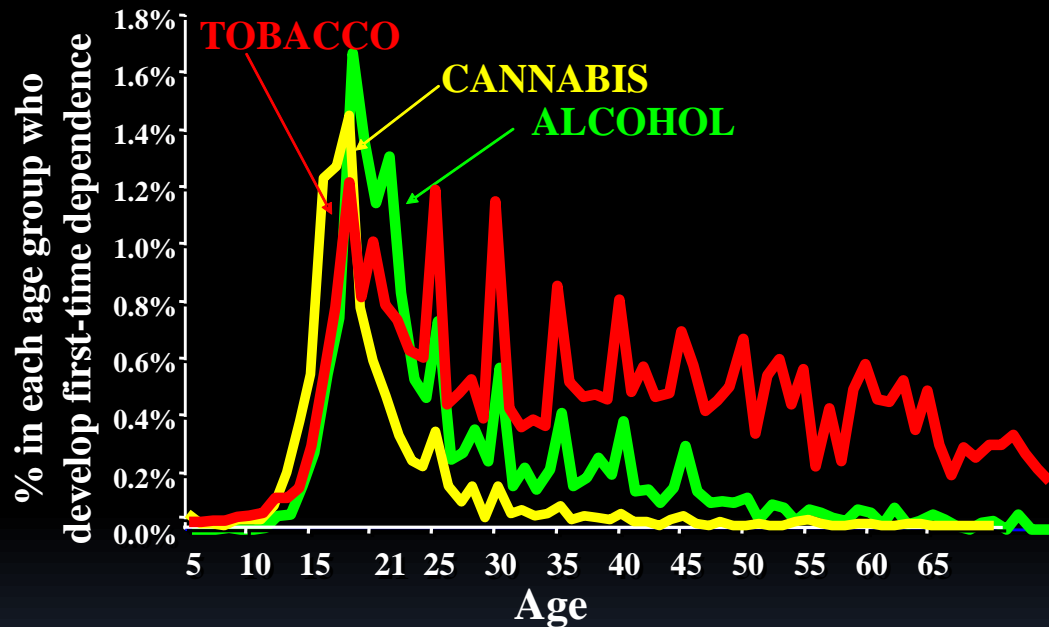
NIDA

- Residents of states with medical marijuana laws are 1.92 times [almost two times] more likely to smoke marijuana
- 1.81 times more likely to have a diagnosis of marijuana abuse/dependence.



- Source: Cerda, Wall, Keyes, Galea, & Hasin, *Drug and Alcohol Dependence*, 2012.

Addiction Is A Developmental Disease that starts in adolescence and childhood



Age at tobacco, alcohol, and cannabis dependence per DSM IV

National Epidemiologic Survey on Alcohol and Related Conditions, 2003.

NIDA

Addiction is a Developmental Disease: It Starts Early

First Marijuana Use, (Percent of Initiates)

1.5%



<12

67%



12-17

26%



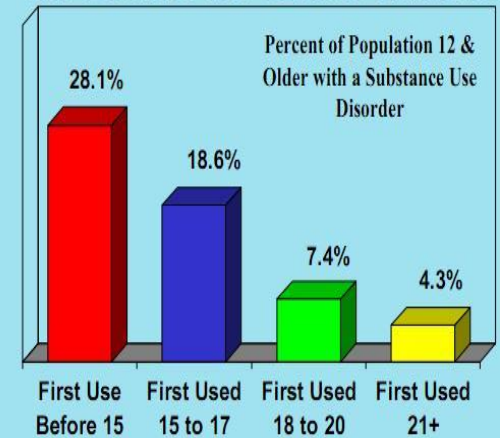
18-25

5.5%



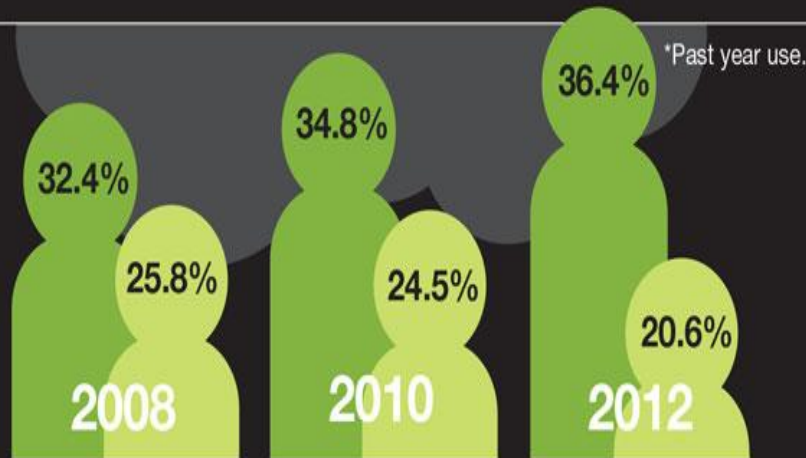
>25

The Earlier Teens Use Any Substance, the Greater the Risk of Addiction



Source: CASA analysis of the National Household Survey on Drug Use and Health (NSDUH), 2009.

MARIJUANA USE AMONG 12TH GRADERS* VS. PERCEIVED RISK



USING



PERCEPTION OF RISK

(saw great risk in smoking marijuana occasionally)

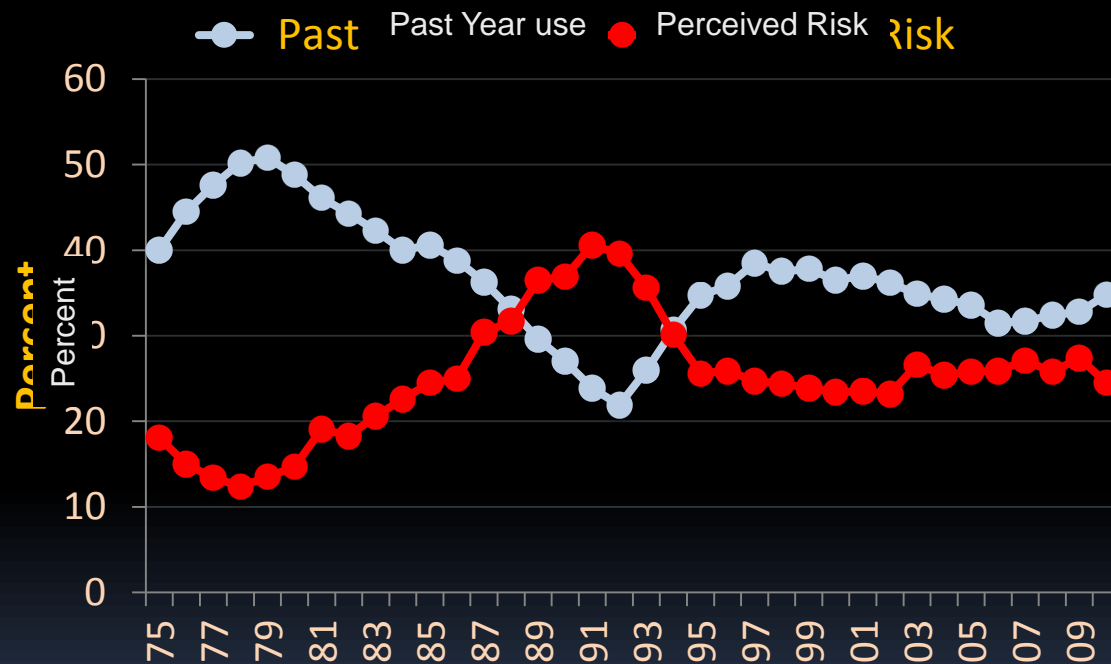


**36.4% EQUATES TO
ABOUT 11 STUDENTS IN
THE AVERAGE CLASS**



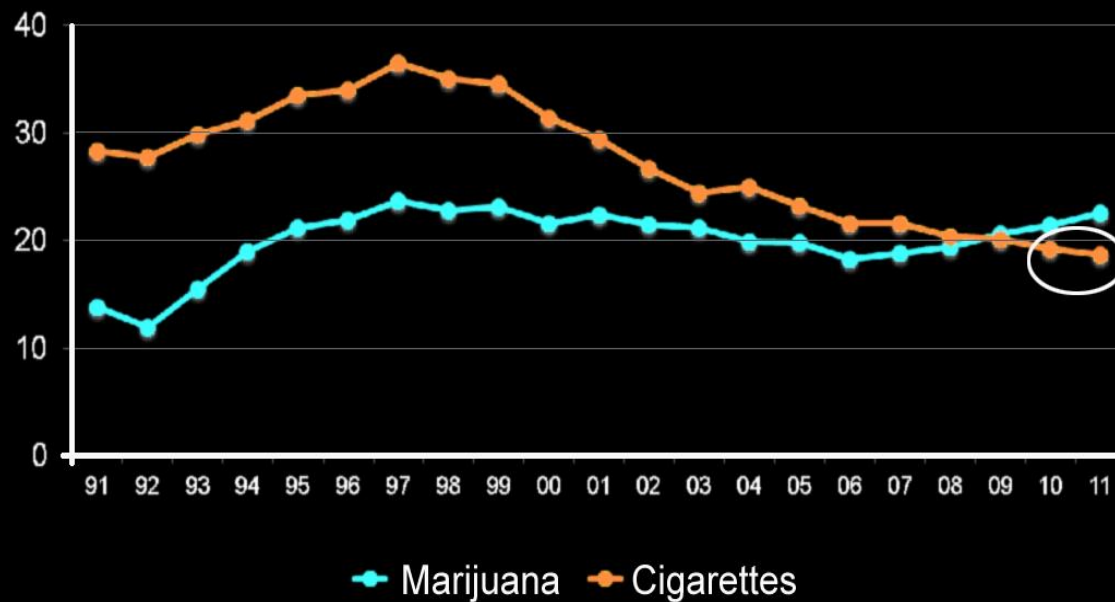
The National Institute on Drug Abuse is a component of the National Institutes of Health, U.S. Department of Health and Human Services. NIDA supports most of the world's research on the health aspects of drug abuse and addiction. Fact sheets on the health effects of drugs of abuse and information on NIDA research and other activities can be found at www.drugabuse.gov.

Changes in Attitude Lead to Changes in Use: Marijuana Use and Perceived Risk in 12th Graders, (1975 to 2010)



Source: The Monitoring the Future study, the University of Michigan

In 2009, Reports of Past Month Use of Marijuana Among 12th Graders Exceeded that of Cigarette for the First Time in the Survey's History



SOURCE: University of Michigan, 2011 Monitoring the Future Study

0 3 0 = 4 0 5 0



Wow, you ever just like, stare at your foot?



Then you're all, like, "whoa that's my foot"



The Body's Natural THC-Like Chemicals

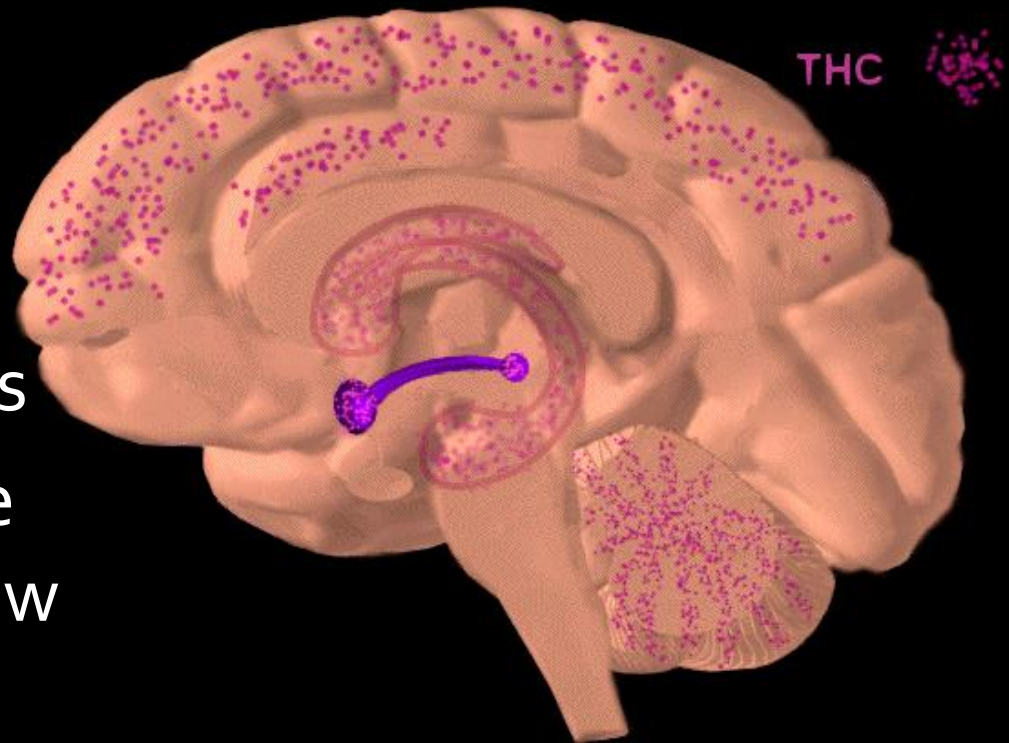
- THC molecule is shaped like naturally occurring “endogenous cannabinoids”
- These endogenous cannabinoids help control a wide array of mental and physical processes in the brain and throughout the body,



Walker, M.J.; Huang, S.M.; Strangman, N.M.; Tsou, K.; and Sanudo-Pena, M.C. Pain modulation by the release of the endogenous cannabinoid anandamide. *Proceedings of the National Academy of Sciences* 96(21):12198-12203, 1999.

How does Marijuana Effect the BODY?

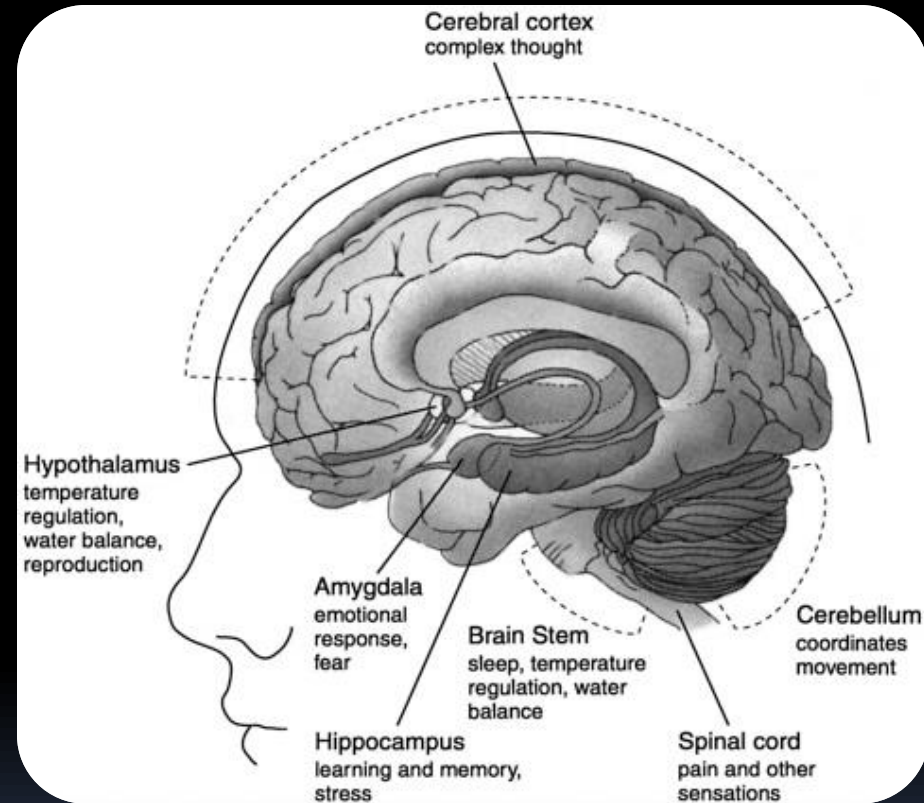
- Attaches to the Cannabinoid receptors on specific nerve cells
- Some areas of the brain have very few or none of these receptors, others have many



Ohlsson, A.; Lindgren, J.E.; Wahlen, A.; Agurell, S.; Hollister, L.E.; and Gillespie, H.K. Plasma delta-9 tetrahydrocannabinol concentrations and clinical effects after oral and intravenous administration and smoking. *Clin Pharmacol Ther* 28(3):409-416, 1980

How does Marijuana Effect the BODY?

- Cannabinoid receptors influence pleasure, memory, thought, concentration, sensory and time perception, coordination of movements, pain sensations, immunity to disease and reproduction



Herkenham, M.; Lynn, A.; Little, M.D.; Johnson, M.R.; Melvin, L.S.; de Costa, B.R.; and Rice K.C. Cannabinoid receptor localization in the brain. *Proc Natl Acad Sci, USA*. 87(5):1932-1936, 1990

The Body's Natural THC-Like Chemicals

- When you smoke marijuana, THC overstimulates the cannabinoid receptors leading to a disruption of the endogenous cannabinoids normal function
- This overstimulation produces the intoxication
- It alters the function of the cannabinoid receptors which can lead to the withdrawal symptoms and addiction.

How does Marijuana Effect the BODY?

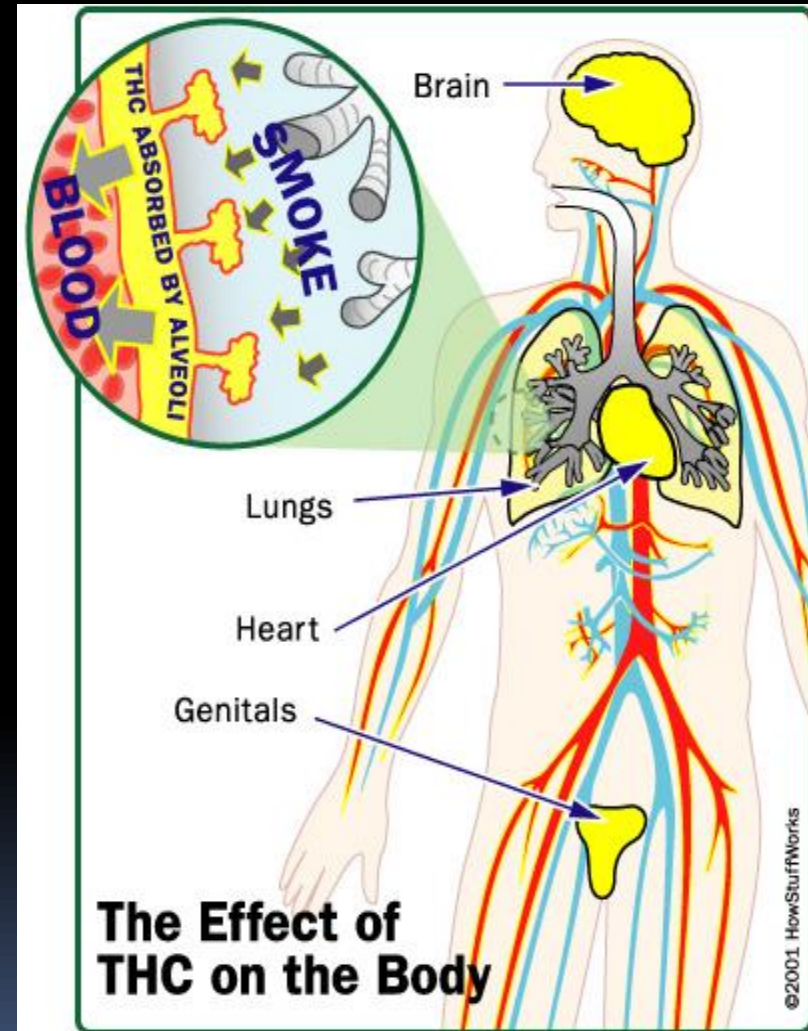
- THC enters the brain and reacts with Ventral Tegmental area and the Nucleus Accumbens, the user begins to feel high or euphoric.
- These cells in the reward center release the chemical dopamine
- User may experience pleasant sensations, colors and sounds may seem more intense
- Time appears to pass very slowly



Chen, J.P.; Paredes, W.; Li, J.; Smith, D.; Lowinson, J.; and Gardner, E.L. Delta 9-tetrahydrocannabinol produces naloxone-blockable enhancement of presynaptic basal dopamine efflux in nucleus accumbens of conscious, freely-moving rats as measured by intracerebral microdialysis. *Psychopharmacology* 102:156-162, 1990

How does Smoked Marijuana Effect the BODY?

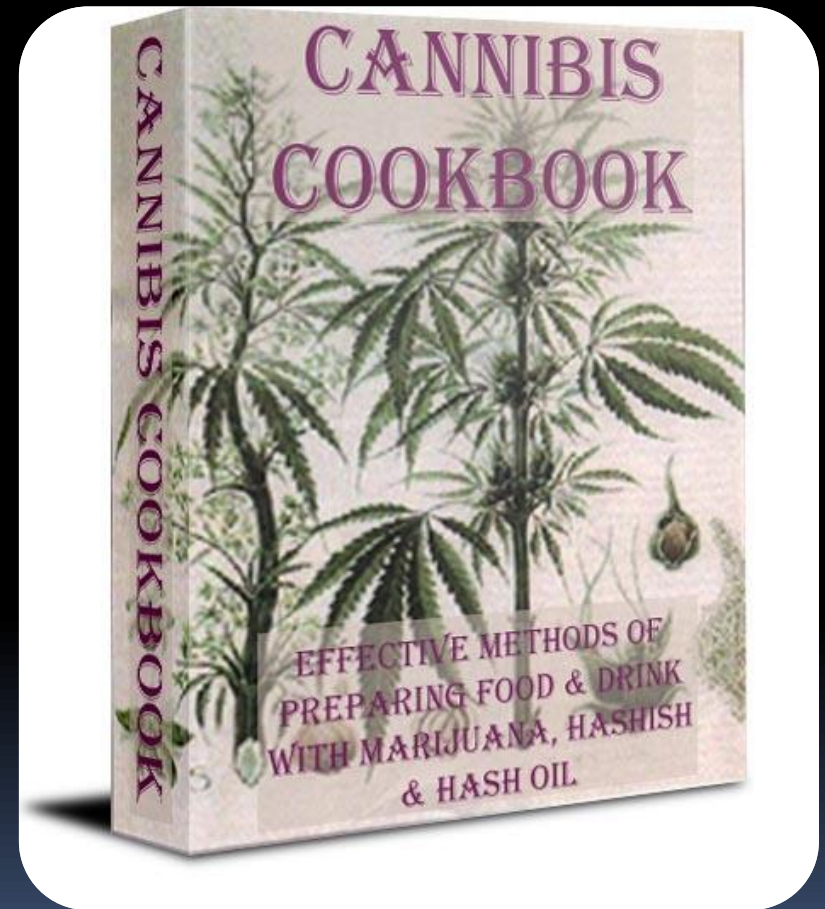
- Smoked THC passes very rapidly from the lungs into the bloodstream and into the brain, effects are immediate and last 1-3 hours



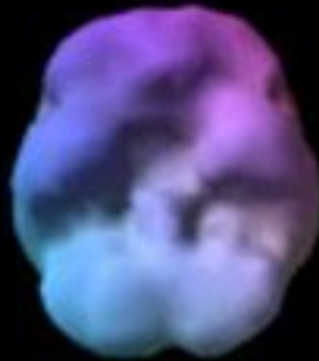
Ohlsson, A.; Lindgren, J.E.; Wahlen, A.; Agurell, S.; Hollister, L.E.; and Gillespie, H.K. Plasma delta-9 tetrahydrocannabinol concentrations and clinical effects after oral and intravenous administration and smoking. *Clin Pharmacol Ther* 28(3):409-416, 1980

How Long does Edible Marijuana Effect the BODY?

- If THC is consumed in food or drink, onset of action is slower
- usually in ½ to 1 hour
- lasts longer, for as long as 4 hours.

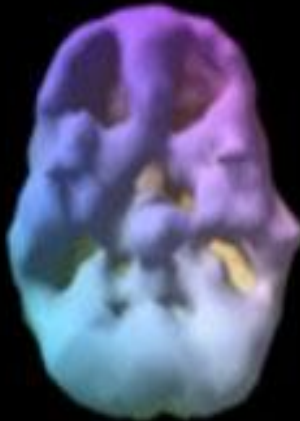


Ohlsson, A.; Lindgren, J.E.; Wahlen, A.; Agurell, S.; Hollister, L.E.; and Gillespie, H.K. Plasma delta-9 tetrahydrocannabinol concentrations and clinical effects after oral and intravenous administration and smoking. *Clin Pharmacol Ther* 28(3):409-416, 1980

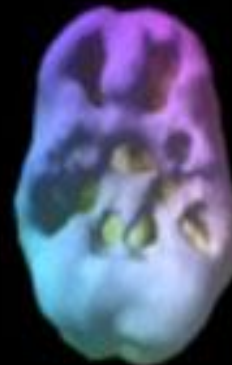


Brain Activity:
Normal, Healthy Brain
(Underside surface)

Marijuana Effects



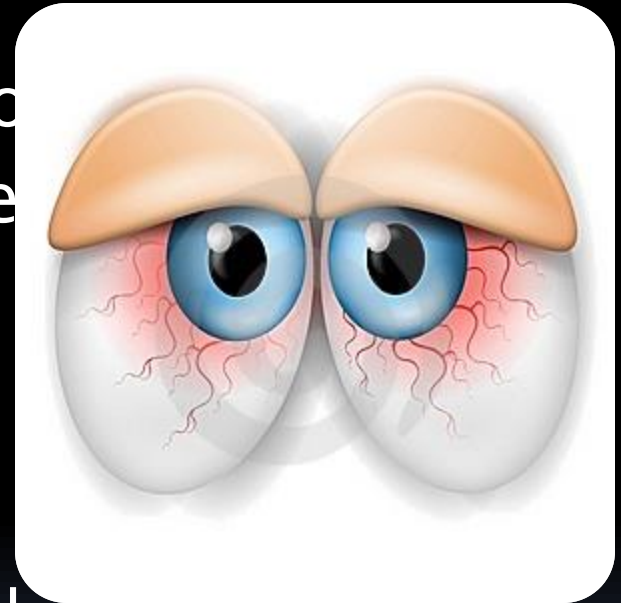
Brain Activity:
18 year old
3 years of
4x week
marijuana use
(underside surface)



Brain Activity:
16 year old
2 years of
daily marijuana use
(underside surface)

How does Marijuana Effect the BODY?

- Within a few minutes, increased heart rate, may increase by 20 to 50 beats per minute and in some cases may even double.
- Bronchial passages relax and become enlarged
- Blood vessels in the eyes expand, making the eyes look red



How does Marijuana Effect the BODY?

- The user's mouth will become dry and the user may feel VERY hungry and thirsty.
- His or her hands may tremble and grow cold
- As euphoria passes, the user may feel sleepy or depressed.
- Occasionally marijuana use produces anxiety, fear, distrust, or panic



Cognitive Impairment: Marijuana

- NIDA study at McLean Hospital revealed that college students who used THC had impaired skills related to
 - Attention
 - Memory
 - Learning
 - 24 hours after they last used the drug

Pope, H G, Yurelun-Todd, D. The residual cognitive effects of heavy marijuana Use in college students. *Journal of American Medical Association*, 275 (7): 521-527, 1996

Cognitive Impairment: Marijuana

- Study at University of Iowa College of Medicine
- Frequent Marijuana users (7 or more times weekly)
- Deficits in Mathematical skills
- Verbal expressions
- Memory –retrieval processes
- Youths with a GPA of D or below were 4 times more likely to have used THC than those with a GPA of A

Block, RI and Ghoneim, MM. Effects of chronic marijuana use on human cognition. *Psychopharmacology*. 1100(1-2):219-228, 1993.



Cognitive Impairment: Marijuana

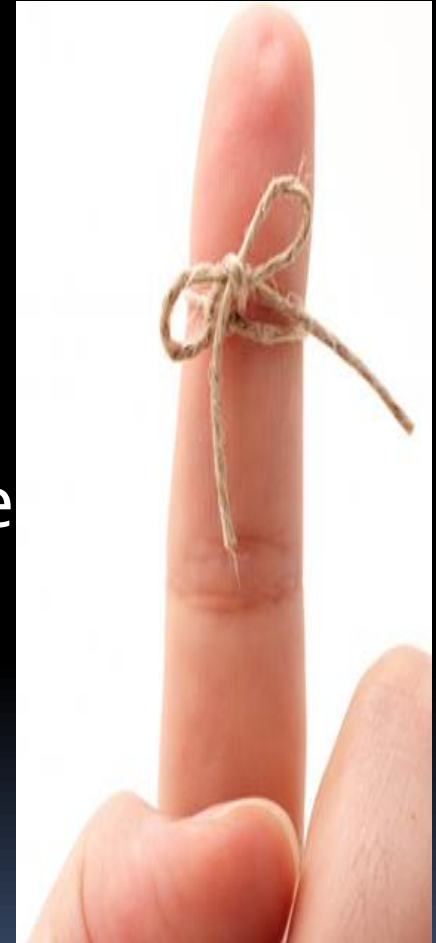
- Other Impairments:
- Sensory and time perception
- Problems with driving
- Difficulty with sports performance
- Effects may be especially problematic during teen's peak learning years when brain is still developing.



The NHSDA Reports, *Marijuana use among youth*. July 19, 2002

Marijuana and Memory

- Heavy marijuana use impairs a person's ability to form memories, recall events and shift attention from one thing to another because of its effect on the Hippocampus
- Chronic THC exposure may hasten the age-related loss of hippocampal neurons.
- Student who smoke THC get lower grades and are less likely to graduate from High School.



September 2012 NIH Study Results

- NIH-funded research shows that long-term marijuana is associated with impaired intellectual functioning, especially if usage starts during the teen years.
- Over 1,000 study participants were given neuropsychological tests in early adolescence, prior to initiation of marijuana use, and then re-tested in mid adulthood after 20 + Years.

[Meter, et al Long-term effects of adolescent-onset and persistent use of cannabis.](#)
[Proc Natl Acad Sci U S A. 2012]

September 2012 NIH Study Results

- Study members with more persistent marijuana dependence **showed greater IQ decline** and greater impairment across **five** different cognitive domains, especially **executive function** and **processing speed**.
- The study was thus able to **rule out pre-existing differences in IQ** between heavy marijuana users and others; it is also significant for including degree of cannabis exposure and age of onset as factors.

September 2012 NIH Study Results

- Those who started use during the teen years showed greater IQ decline than those who began use as adults.
- These latter results are especially troubling, given recent data showing **increased marijuana use** among teens over the last five years, along with declines in perceived risk of harm associated with use.

[Meter, et al Long-term effects of adolescent-onset and persistent use of cannabis.](#)

[Proc Natl Acad Sci U S A. 2012]

September 2012 NIH Study Results

- The results of this study are consistent with the notion that **cannabis may actually cause some of the neuropsychological deficits seen in regular cannabis users.**



[Meter, et al Long-term effects of adolescent-onset and persistent use of cannabis.](#) [Proc Natl Acad Sci U S A. 2012]

Marijuana and Memory

- A study of 129 college students who were heavy users of THC (27 of last 30 days)
- More trouble sustaining and shifting attention, registering, organizing and using information than did the smokers who used only 3 of last 30 days.
- Someone who smokes THC once daily may be functioning at a reduced intellectual level all of the time.
- Long-term heavy users who stopped for 1 week had impaired recall of words from a list, but returned to normal once off for 4 weeks.

Pope, H.G., and Yurgelun-Todd, D. The residual cognitive effects of heavy marijuana use in college students. *JAMA* 275(7):521-527, 1996

Marijuana and Life Skills

- Researcher gave students a battery of tests measuring problem-solving and emotional skills
- 8th grade and again in 12th grade
- Students who were already smoking THC started off slightly behind their peers
- Distance separating the two groups grew significantly by their senior year.
- Reduced capacity for self-reinforcement, and decreased confidence and perseverance in the pursuit of goals.

Marijuana and Careers

- Workers who smoke THC are more likely than their coworkers to have problems on the job
- Increased absences, tardiness, accidents, workers' compensation claims and job turn over.
- Workers who had positive Pre-Employment drug screens had **55% more industrial accidents, 85% more injuries and a 75% increased in absenteeism.**



Marijuana and Careers

- Group of Current, and Former heavy users of THC with control group of people who had smoked 1-50 times in their lives
- Fewer of cannabis users completed college
- More had incomes of less than \$30,000
- Cannabis users reported that **THC had effected their cognitive abilities, career achievements, social lives and physical and mental health**

Gruber, A.J.; Pope, H.G.; Hudson, J.I.; and Yurgelun-Todd, D. Attributes of long-term heavy cannabis users: a case-control study. *Psychological Medicine* 33:1415-1422, 2003.

Marijuana and Movements

- THC also disrupts coordination's and balance by binding receptors in the cerebellum, and basal ganglion, which regulate balance, posture, coordination of movement and reaction time
- 6% to 11% of fatal accident victims test positive for THC.



Marijuana and Movements

- National Highway Traffic Safety Administration study show even a moderate dose of THC alone impaired driving performance.
- Even a low dose of THC combined with alcohol effected driving markedly greater than either moderate THC or Alcohol alone.
- Driving indices measured included reaction time, visual search frequency and the ability to perceive and/or respond to changes in the relative velocity of other vehicles.

- An examination of 9 studies over the past 2 decades concluded that drivers who tested positive for marijuana, or who reported using marijuana, are **more than twice as likely** as other drivers to be involved in motor vehicle crashes.



- *Source: Epidemiologic Reviews, Volume 34, 2012.*

If a driver is under the influence of alcohol, their risk of a fatal crash is 13 times higher
If under the influence of both alcohol and marijuana, their risk increases 24 times that of a sober person.

How are things going in



- Drivers who tested positive for marijuana in fatal car crashes doubled between 2006 and 2010, while all fatal accidents decreased over the same time period.
- *Source: CO Department of Transportation, 2012.*

Marijuana and Toxic Psychosis

- High doses of drug may result in acute toxic psychosis which included hallucinations, delusions, and depersonalization
- They appear to occur more frequently when a high dose of cannabis is **consumed in food or drink**, rather than smoked.

Marijuana and Physical Health

- A study of 450 people who **smoke THC frequently but NOT tobacco** had more health problems and missed more days of work than nonsmokers do.
- The majority of sick days were used because of respiratory illnesses
- Many have daily cough and phlegm production,
- Increased risk of lung infections and a greater tendency to develop COPD

Marijuana and Cancer

- Cancer of Respiratory Tract and Lungs is promoted by THC smoke
- 173 Cancer patients and 176 healthy individuals, showed that **smoking THC increased the likelihood of developing cancer of the head or neck and the more THC smoked, the greater the risk.**
- Marijuana smoking doubled or in some cases tripled the risk of these cancers.

Marijuana and Cancer

- THC promotes cancer of lungs and other parts of the Respiratory track because it contains irritants and carcinogens.
- Marijuana smoke contains **50% to 70% more carcinogenic hydrocarbons than does tobacco smoke**
- It also produces high levels of an enzyme that converts certain hydrocarbons into their carcinogenic form and may accelerate the malignant cell changes.

Marijuana and the Immune System

- Studies suggest that smoking marijuana is a general 'Immunosuppressant'
- It effects the body's ability to defend against infections by weakening macrophages (Killer cells) and the all-important T-cells.
- Smoking THC can have a very serious negative effect on pts with HIV/AIDS, and can accelerate the progression from HIV to AIDS and increase the occurrence of infections and Kaposi's Sarcoma
- It has a negative effect on patients with organ transplantation or cancer chemotherapy
- These are the very conditions that "medical" marijuana may be prescribed for

Marijuana and the Immune System

- Smoking can damage the cells in the bronchial passages which protect the body against inhaled microorganisms
- It decreases the effectiveness of the immune cells in the lungs to fight off fungi bacteria, and tumor cells
- The immunosuppressant has an increased **negative effect on patients with organ transplantation or cancer chemotherapy**
- These are the very conditions that “medical” marijuana may be prescribed for



Marijuana and the Heart

- Marijuana increases heart rate from 70 beats per minute up to 120 to 140 beats per minute
- At the same time blood pressure is lowered, resulting in decrease flow of blood to the lungs
- This reduces the oxygen carrying capacity of blood
- One study has shown that a person's risk of heart attack during the **first hour** after smoking marijuana is **four times their usual risk!**



Marijuana and Depression

- Depression, anxiety and personality disturbances are all associated with Marijuana use
- Causes problems or makes existing problems worse
- Compromises ability to learn and remember and cope with problems
- Triggers bipolar, psychosis, and schizophrenia and panic disorder




Brook, J.S.; Rosen, Z.; Brook, D.W. The effect of early marijuana use on later anxiety and depressive symptoms. *NYS Psychologist* January:35-39, 2001

CAMH Study 2001-2006

- 14,531 adults from Ontario were assessed with 12 item questionnaire
- Freq. of cannabis use was in 5 categories: from no use to more than once per day
- Anxiety and Mood Disorders (AMD) were more common among heavy cannabis users (18.1%), lowest among abstainers (8.7%)
- Data also revealed that even low levels of THC use can increase risk of AMD.



Marijuana and Infertility

- 2008 study at University of Buffalo,
 - Men who smoke marijuana have significantly less seminal fluid
 - A lower sperm count
 - Their sperm behave abnormally
 - This may adversely effect fertility
 - THC is stored in the fat cells so it can have effects for a very long time
- 



A study released earlier this year showed that people who used marijuana heavily in their teens and continued through adulthood showed a significant drop in IQ between the ages of 13 and 38—an average of 8 points for those who met criteria for marijuana dependence.

THOSE WHO NEVER USED MARIJUANA SHOWED NO DECLINES IN I.Q.



The National Institute on Drug Abuse is a component of the National Institutes of Health, U.S. Department of Health and Human Services. NIDA supports most of the world's research on the health aspects of drug abuse and addiction. Fact sheets on the health effects of drugs of abuse and information on NIDA research and other activities can be found at www.drugabuse.gov.



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