

# One Toke Over the Line?

What you need to know about Marijuana

Erin Snyder, MD

Common Ambulatory Topics

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*Modified from Hillary Kunins CRIT 2011*

Today's speaker has no conflict of interest to disclose.

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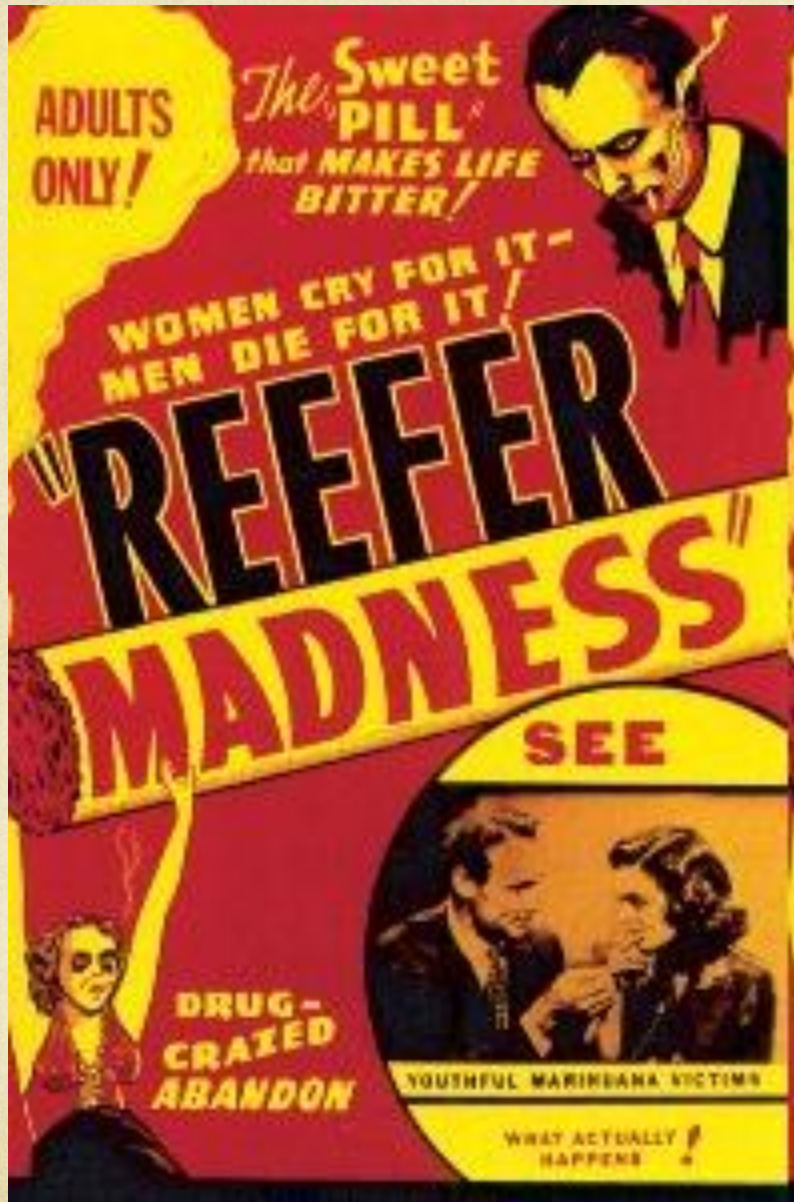
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# Fact or Fiction?

1. Marijuana use is increasing.
2. Withdrawal symptoms occur with marijuana cessation.
3. No adverse health effects occur with marijuana use.
4. You can't overdose on marijuana.
5. Marijuana abuse and dependence is treatable.
6. There are defined safe limits for marijuana use.

# Roadmap

1. History of Marijuana in the US
2. Biochemical structure and effect
3. Epidemiology
4. Impact on health
5. Medical use
6. Presenting problems in primary care
7. Treatment



# Legal History

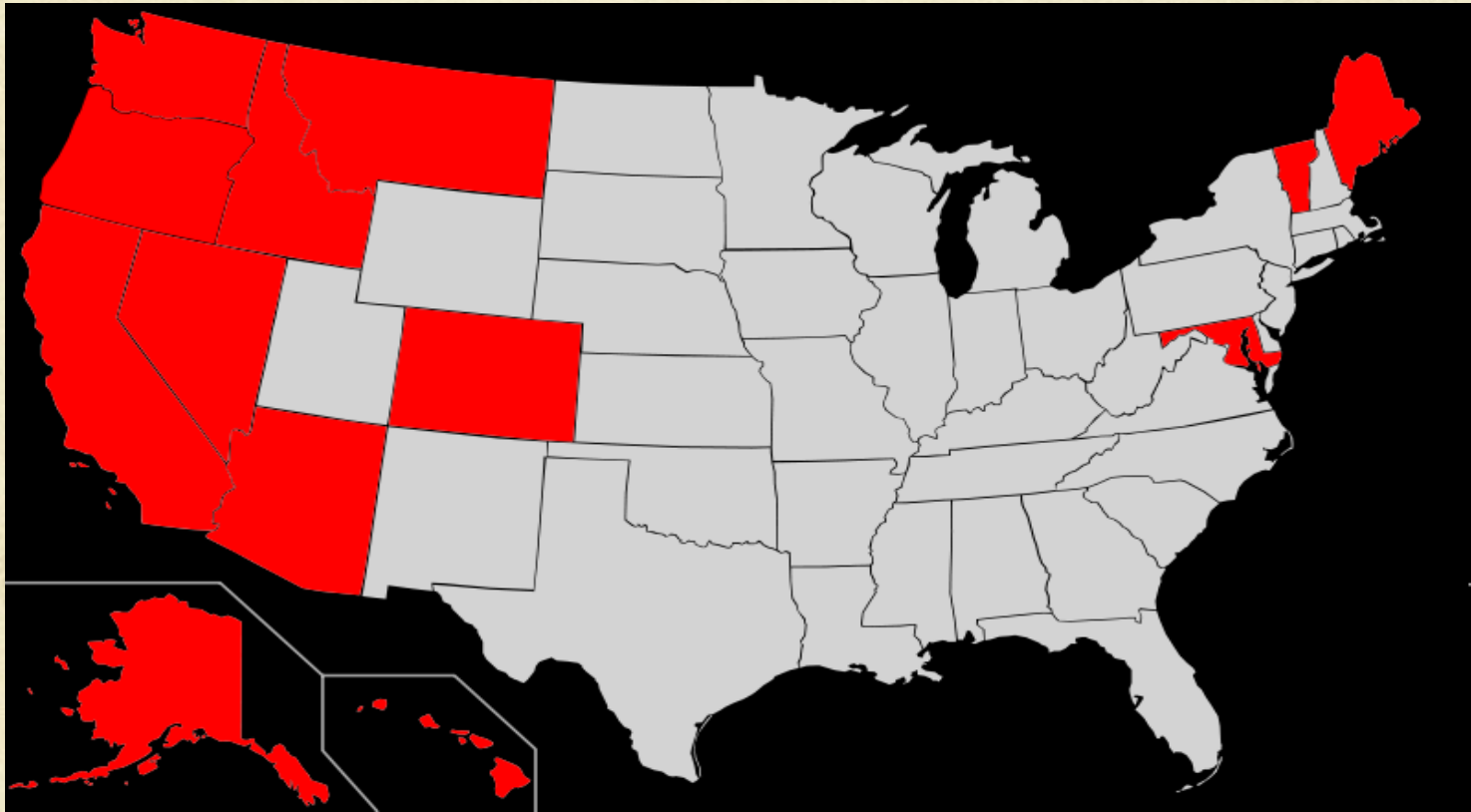
- 1937 Marijuana Tax Act





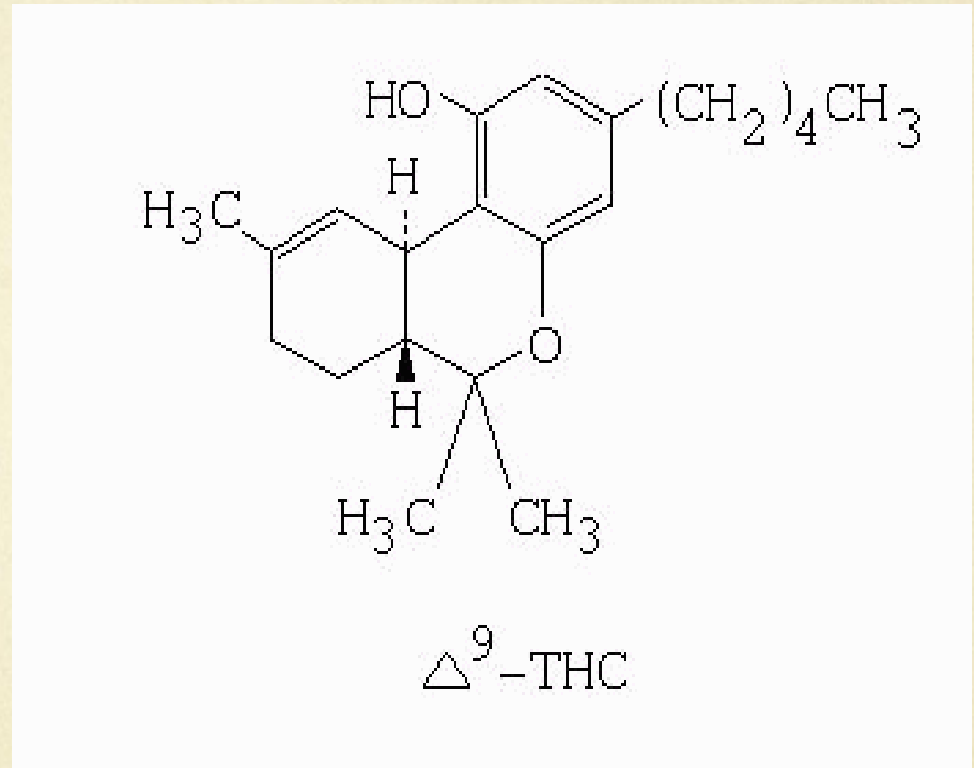
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# 1996 Medical Marijuana



- **Passed:** Alaska, Arizona, California, Colorado, DC, Delaware, Hawaii, Maine, Michigan, Montana, Nevada, New Jersey, New Mexico, Oregon, Rhode Island, Vermont, Washington
- **Pending:** Illinois, Massachusetts, New Hampshire, New York, Ohio, Pennsylvania
- **Introduced:** Alabama, Connecticut, Florida, Idaho, Iowa, Kansas, Mississippi, North Carolina, Oklahoma, Texas, West Virginia

# Biochemical Structure of Marijuana



Delta-9-tetra-hydrocannabinol

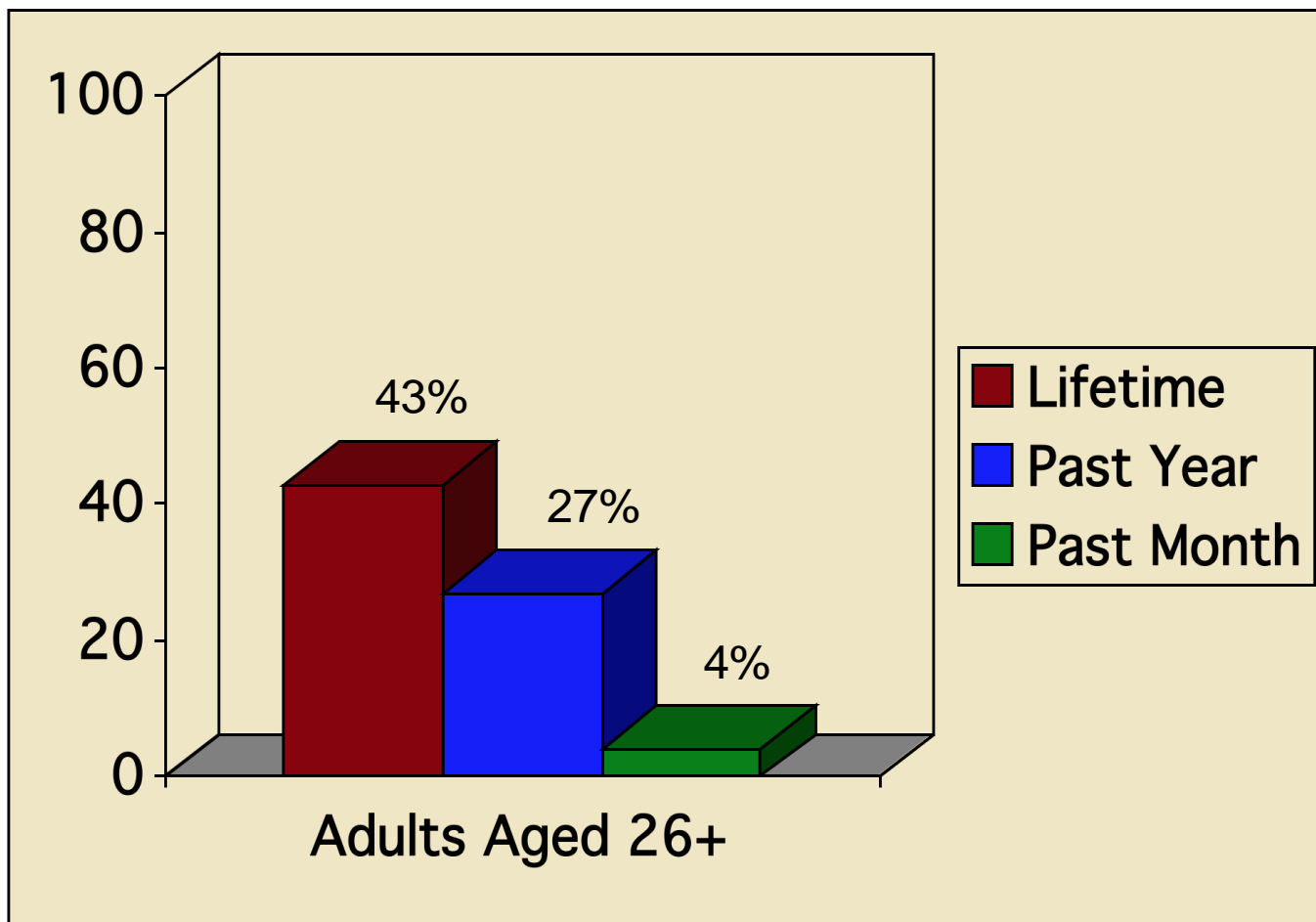
# Marijuana

- Available as marijuana, hashish, hash oil
  - Smoking is most efficient delivery system
  - Also eaten, steeped in tea
- Increasing potency
  - THC content of cannabis 2% 1980 to >8% in 2006
- “High”: Onset 30 min, lasts 1-2 hours
  - 30 days to fully eliminate

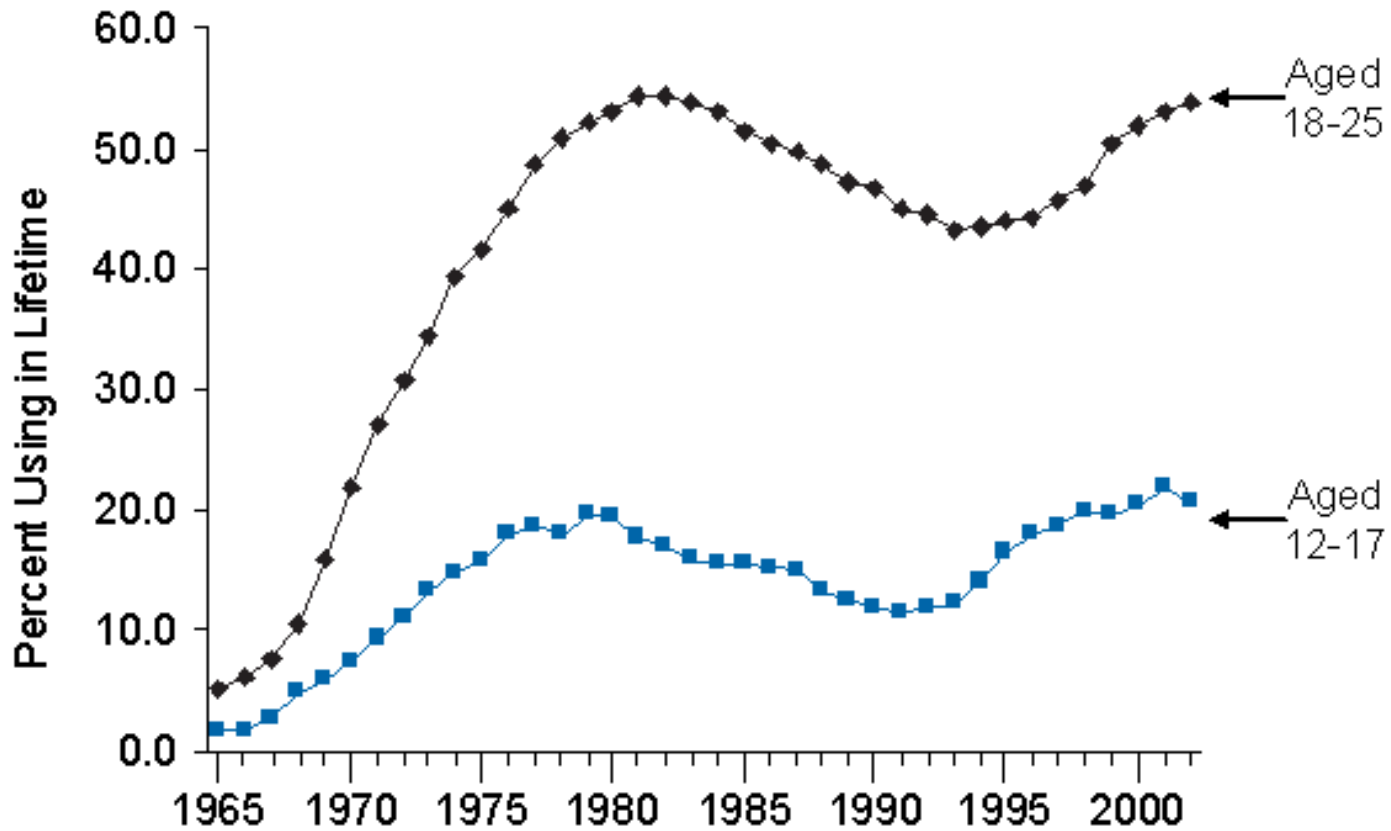
# Acute Effects of Smoked Marijuana

- Euphoria, relaxation
- Intensity of perception
- Distortion of time and space
- Memory impairment
- Appetite stimulation, “munchies”
- No death by overdose
  - Estimated fatal human dose 15-70g
  - Average dose 2-3mg

# 2008 Marijuana Use



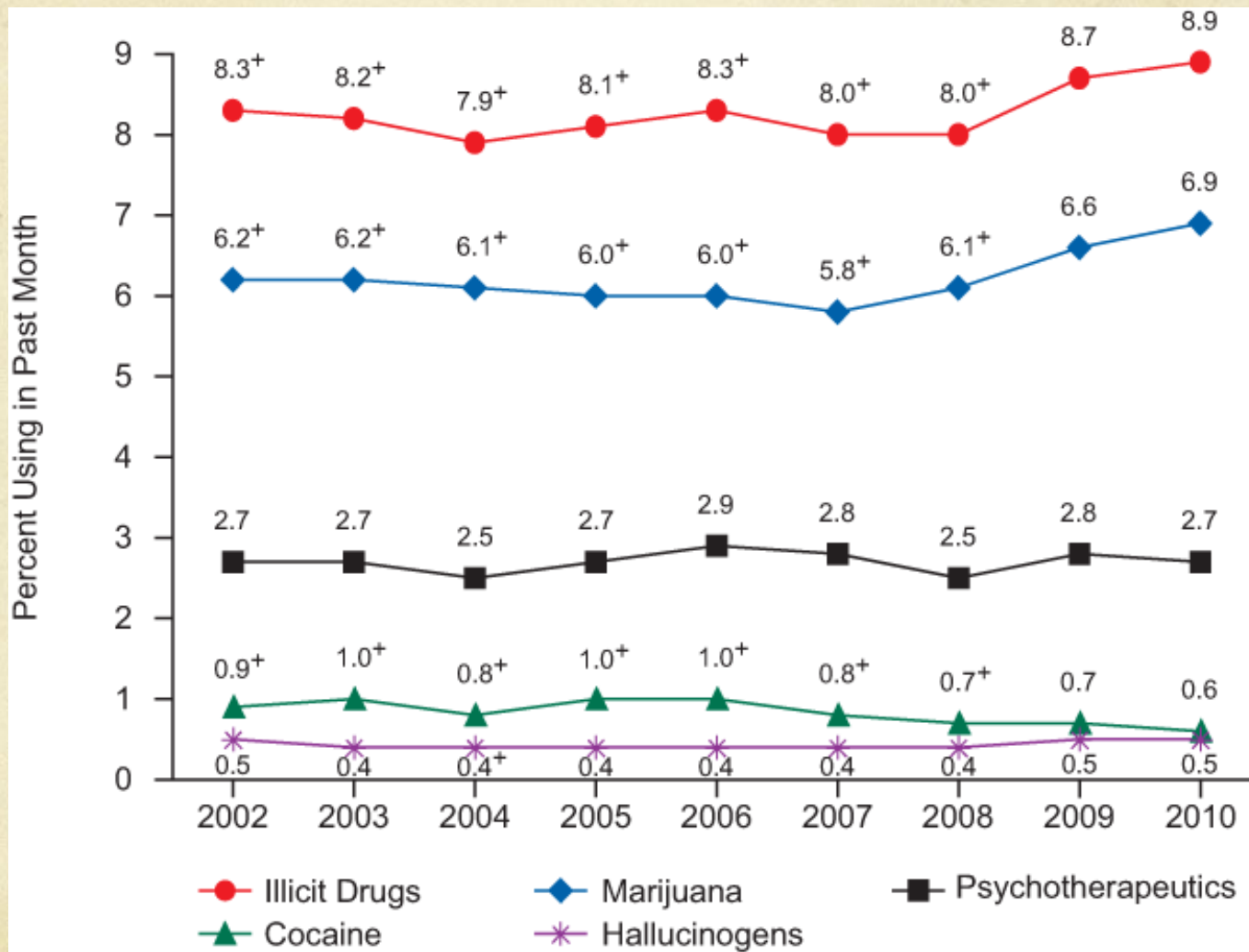
# Lifetime use Marijuana



# 2010 Marijuana Use

- Current illicit drug in adults use 6.6%
  - Marijuana 4.8%
    - Significant increase over 2002-2008
- 2.4 million persons used Marijuana for the first time in 2010
  - 6600 new users/day
  - Rate of new users 26 and older is rising
- 10% of one time users become daily users
  - 20-30% become weekly users

# Illicit Drug use in Last Month, 12 or older



# Accidents

- Higher rate of hospitalizations, ER visits, Motor Vehicle Accidents
- Is intoxication worse than ETOH?
  - 2-3x MVA risk of non user vs ETOH 6-15 risk
  - Cannabis intoxicated drive more slowly, take fewer risks

# Cognition

- Short term
  - Transient effects on episodic memory & learning
  - Motor & Visual tracking (driving) x 2-5 hrs after use
- Long term use
  - After 3 weeks of abstinence, adolescents showed
    - slower psychomotor speed
    - diminished planning/sequencing
  - FMRI shows less activity in memory and attention areas even after 28 days abstinence
  - Reduced volume of hippocampus and amygdala in long term users

# Psychosis

- Multiple epidemiologic cohort studies:
  - Increased psychotic symptoms & schizophrenia
    - Particularly with use in early adolescence, dose response relationship
  - Dopamine release
- But not all clear
  - Where do other risks fit in? prior psychotic sx, genetic risk
  - No rising schizophrenia diagnoses with rising marijuana use

# Pulmonary

- Smoked marijuana exposes to more than THC
  - Cough, increased sputum, increased respiratory infections
  - No decline in lung function or increased risk COPD
  - Lung Cancer
    - Associated with cellular changes consistent with precancerous state
    - Associated with increased risk cancer in combination with tobacco use

# Cardiovascular

- Dose dependent increase in heart rate
  - Case control study: cannabis increased risk of MI 4.8 times in the hour after use
  - Higher risk for weekly users than less than weekly users
- Lab studies: smoking cannabis provokes angina

# Reproductive

- Males: hormonal alterations, sperm function
- Females: not much evidence for birth defects
  - Possible decreased birthweight, but less clear association that tobacco smoking
  - Children born to users have early developmental delay, not persistent

# Can It Be *Medically Useful*?

- Possible:
  - Anti-emetic
  - Appetite stimulant
  - Pain control (central) – multiple sclerosis
  - Anxiolytic
  - Glaucoma –mild decrease intraocular pressure
  
- Dronabinol (Marinol)
  - Slower onset
  - Not as potent

# Medical Marijuana



- Nausea/vomiting
- Lack of appetite
- Glaucoma
- Many types of cancer
- Premenstrual syndrome
- Migraines
- Fibromyalgia
- Insomnia
- Spasticity
- Neurogenic pain
- Movement disorders
- Asthma
- Alcohol abuse
- Bipolar disorder
- Depression
- Epilepsy
- Alzheimer's disease
- Inflammatory bowel disease
- Collagen vascular disease

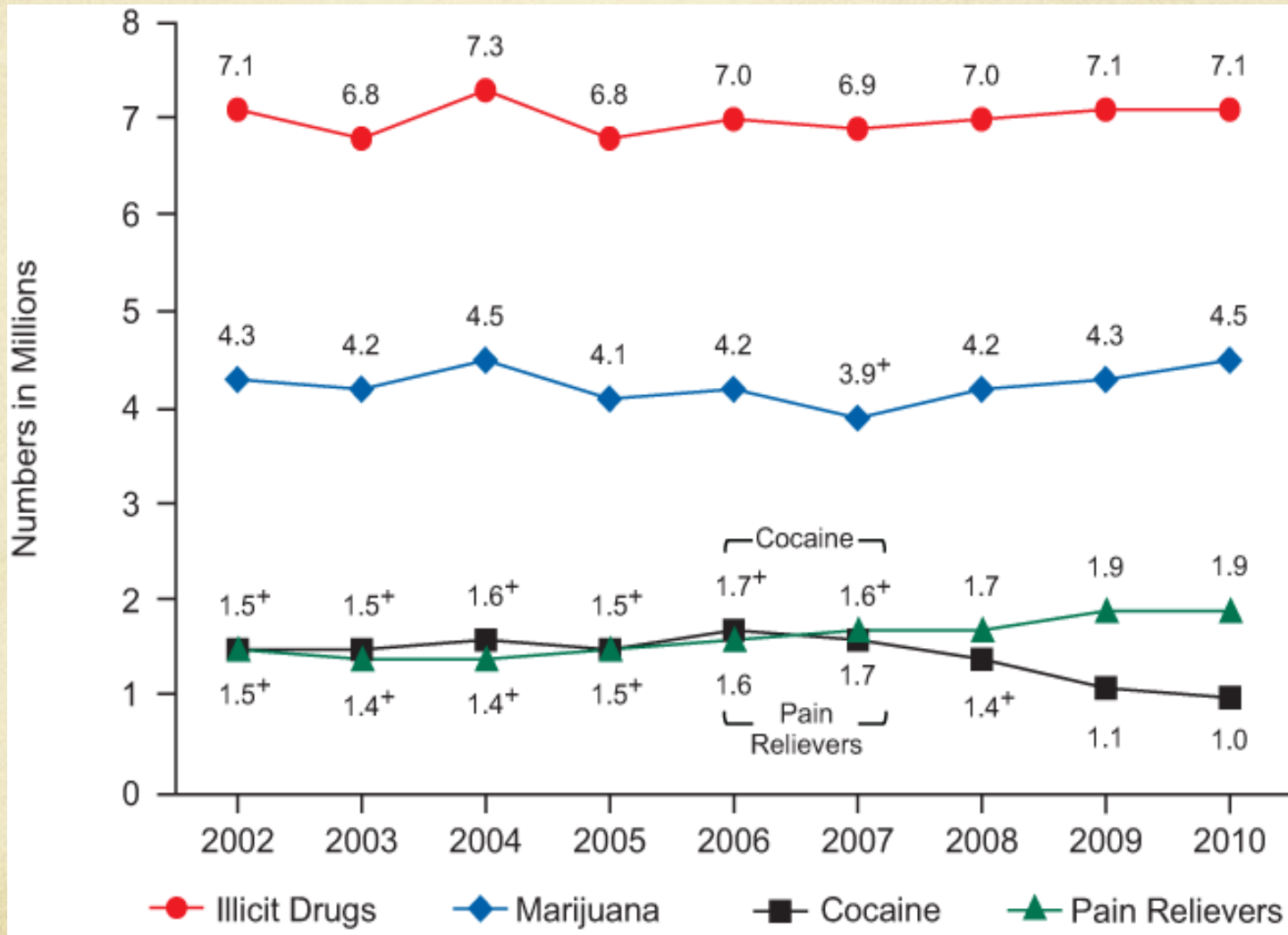
# Marijuana Abuse? Addiction?

- Use
  - Moderate vs Hazardous
- Abuse: Drug use that leads to: ( $\geq 1$ )
  - Failure to fulfill major role obligations
  - Hazardous situations
  - Legal problems
  - Social/interpersonal problems

# Marijuana Abuse? Addiction?

- Dependence: ( $\geq 3$ )
  - Tolerance
  - Withdrawal
  - Great deal of time spent
  - Important activities given up/reduced
  - Using more or longer than intended
  - Persistent desire to control substance use
  - Use despite knowledge of a problem caused by drug use

# Illicit Drug Dependence in Past Year, 12 and older



# Dependence and Withdrawal

- Risk of dependence
  - 9% for marijuana, higher in those who start using in adolescence
  - 17% for cocaine
  - 32% nicotine
- Withdrawal
  - Insomnia, craving, anorexia, irritability, anxiety
  - Onset 8-10 hours after stopping drug
  - Lasts 4-14 days
- Chronic use leads to tolerance

# Gateway drug?

- Sequence: One substance regularly initiated before the second
  - Well described with marijuana, tobacco, alcohol
- Association: Initiation of one substance increases likelihood of initiation of the second
  - Epidemiological studies suggest yes, after controlling for a variety of confounders
  - Prevention programs targeted at marijuana reduce use of other drugs
- Causation: use of the first substance actually causes use of the second
  - Australian twin studies: at age 17, one twin has used marijuana, the other has not
    - Early marijuana use increases significantly the use of other illicit

# Clues in Primary Care

- Respiratory
  - Asthma exacerbation
  - Chronic cough
- Mental Health: depression, paranoia
- School/Work difficulty
  - Attention, concentration
- Difficulty stopping or controlling use

# Management of Problematic Use

- We don't know: Risky use versus safe use
  - If you suspect a problem, counsel/treat/refer as you would other substances
- Pharmacotherapy: No approved medication
  - ?cannabinoid antagonist
  - ?oral THC to manage withdrawal, maintenance, or short-term treatment
- Behavioral
  - In substance abuse treatment:
    - cognitive-behavioral therapy, contingency management, motivational enhancement
  - In ambulatory and emergency care
    - Brief interventions - similar to alcohol use - some data

# What can you tell your patients?

- No safe limits have been defined
- The gateway “association” is present
  - Addiction is real; but conditional dependence low
- Medical and social complications do occur
  - Cognitive, Respiratory, Reproductive effects
  - Psychotic symptoms, especially in adolescence
  - Death by OD is not reported
  - Withdrawal symptoms exist
- Behavioral treatment can help

# Fact or Fiction?

1. Marijuana use is increasing. True
2. Withdrawal symptoms occur with marijuana cessation. True
3. No adverse health effects occur with marijuana use. False
4. You can't overdose on marijuana. True
5. Marijuana abuse and dependence is treatable. True
6. There are defined safe limits for marijuana use. False

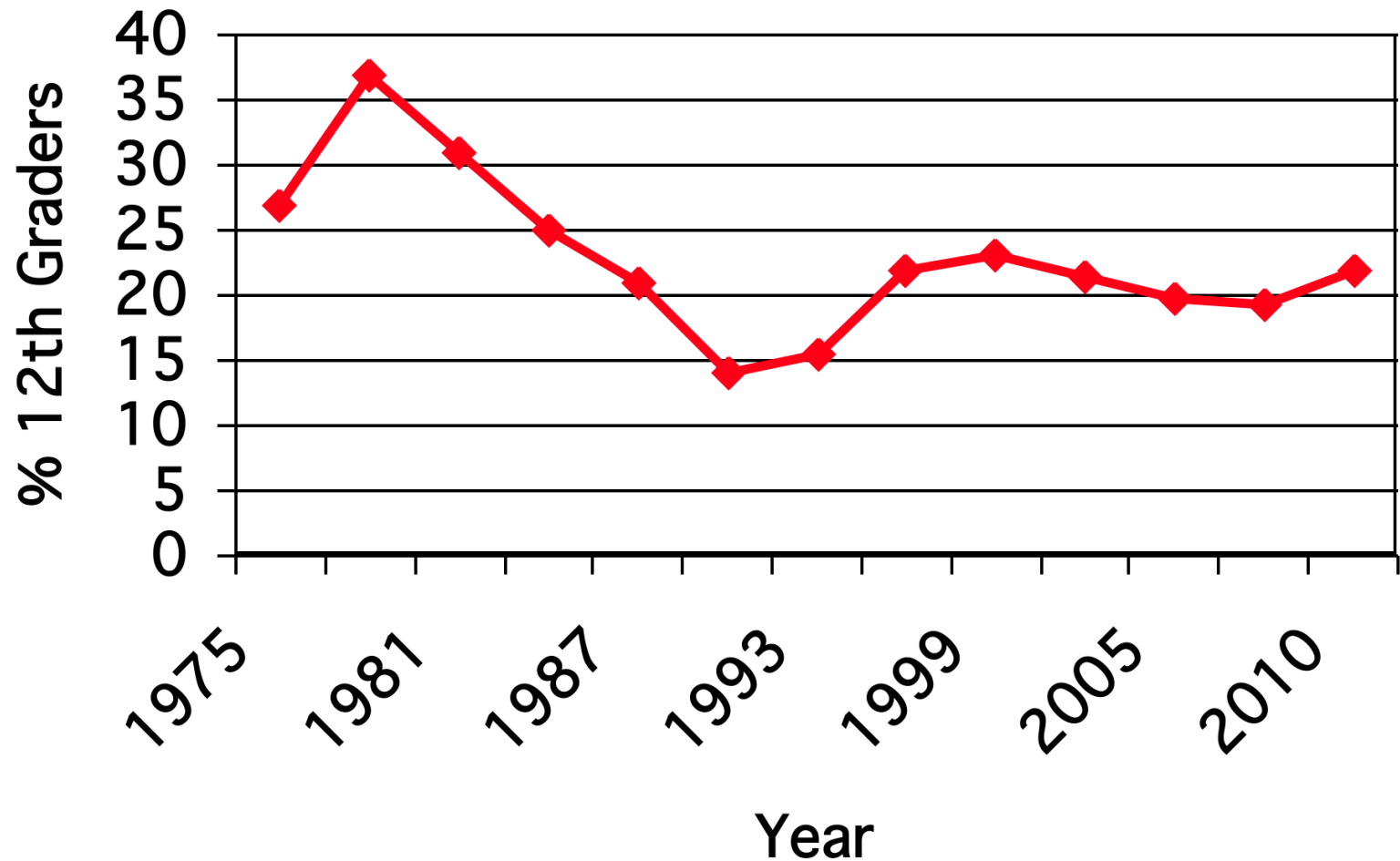
# Websites

- National Institute on Drug Abuse
  - [www.drugabuse.gov/drugpages/marijuana.html](http://www.drugabuse.gov/drugpages/marijuana.html)
- White House Office of National Drug Control Policy
  - [www.whitehousedrugpolicy.gov/drugfact/marijuana/index.html](http://www.whitehousedrugpolicy.gov/drugfact/marijuana/index.html)
- Substance Abuse and Mental Health Services Administration- National Drug Use Survey
  - [www.samhsa.gov/nsduhlatest.htm](http://www.samhsa.gov/nsduhlatest.htm)
- Pro-Con page on Marijuana
  - [Medicalmarijuana.procon.org](http://Medicalmarijuana.procon.org)

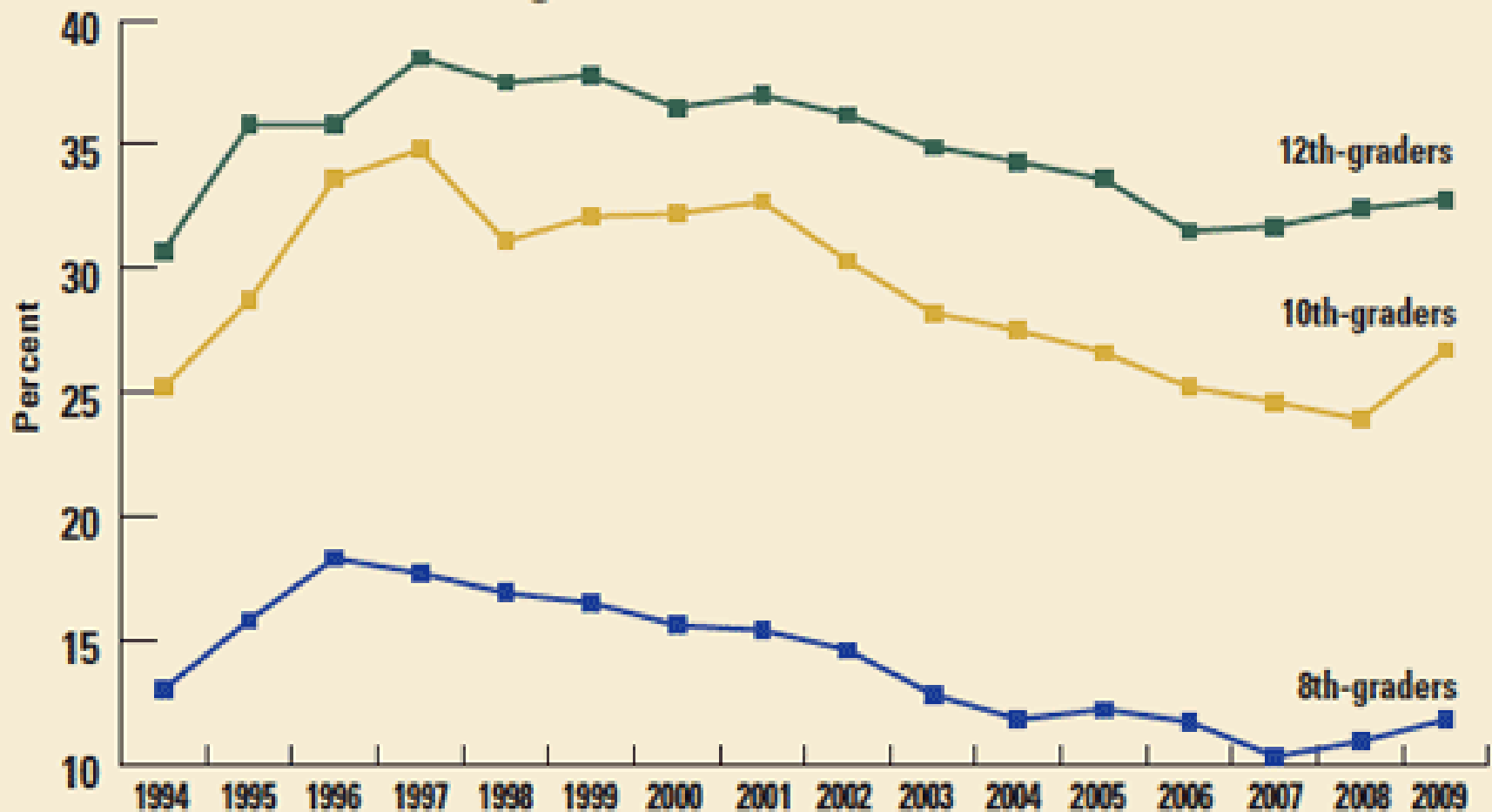
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# Past-Month Marijuana Use, 12 Graders



## Long-Term Trends in Annual\* Marijuana Use Among 8th, 10th, and 12th Graders



*\*use in the past 12 months*

Source: 2009 Monitoring the Future Survey