

Marijuana

A Briefer for Reefer

Stefan G. Kertesz, MD, MSc

CRIT 2009

University of Alabama at Birmingham

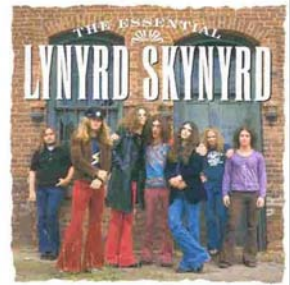
Birmingham VA Medical Center

Modified from Robin H. Barnes, Chief Resident Immersion Training, 2006

A Briefer for Reefer







279 Billboard songs (2005). 1/3 with substance use. Average adolescent gets 84 references to substance use daily. Rap> Country> Hip-Hop/R&B>Rock

Snoop Dogg, Three 6 Mafia (Academy Award, 2006), Ella Fitzgerald (Wacky Dust, i.e. cocaine), Lynrd Skynrd (That Smell), Black Sabbath (Sweet Leaf), Ray Charles (Lets Go Get Stoned)

Primack *Archives Ped & Adol Med.* 2008; 162(2): 169-175:

Fact or Fiction?

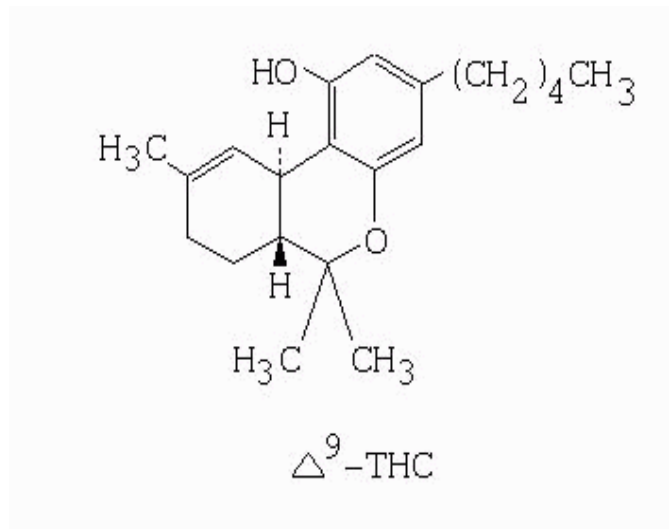
- Marijuana use among teens is increasing
- Marijuana is safe
- Marijuana is a “gateway” drug
- Marijuana causes psychosis
- You can’t overdose on marijuana

US love-hate relationship with MJ

- Introduced to US by Mexican immigrant workers end 19th-early 20th C.
- Violence, seen as menace to American society
- 1937: complete ban
- Growing use 1950's by Beat & jazz artists
- 1970's widespread use; 10 states decriminalize
- 1980's "Say no to drugs." Severe penalties for trafficking
- Mid-1990's to present: increasing use by adolescents, young adults
- Federal campaigns vs selected state initiatives

History summarized by Robin Barnes, CRIT 2006

Agent - Marijuana



Delta-9-tetra-hydrocannabinol

Marijuana

- Available as marijuana, hashish, hash oil NIDA
- Potency: 1 joint (10 mg in 1970s → 150+ mg in 1990s)
- Fairly easy or very easy to get: 67% of 10th graders in 2008 (78% in 1998) *Monitoring the Future*
- Bioavailable in seconds after smoking
- 30 days to fully eliminate
- Binds CB1 receptor

When we do the numbers...

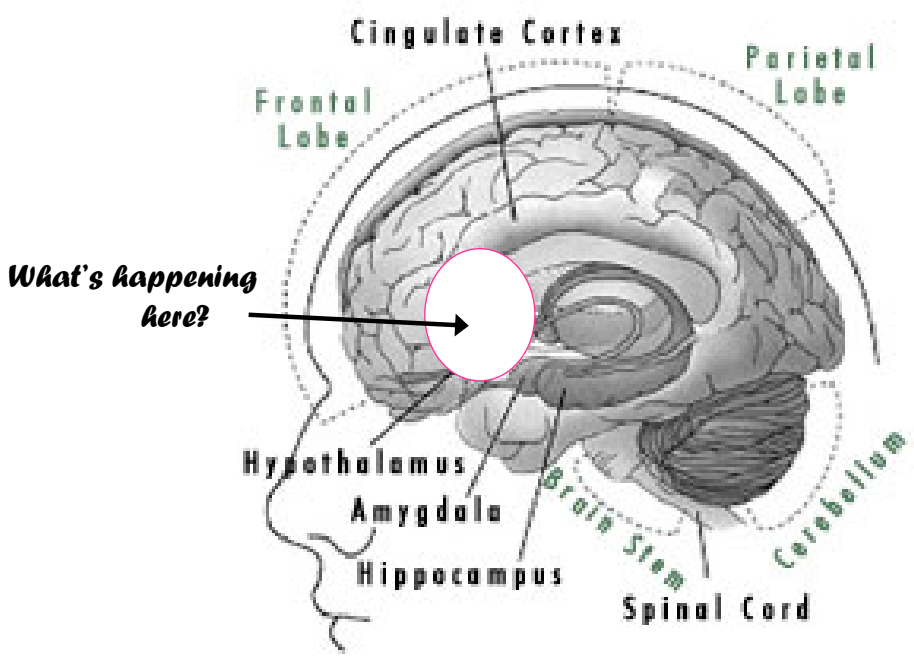
	Dose	Unit Cost	Usual 24 hour Use	24 hour Cost
Cigarettes	One cig	\$0.25	10	\$2.50
Alcohol	One drink	\$1.00	1-5	\$1.00 to \$5.00
Marijuana	One joint (0.5-1.0 gm)	\$0.50 to \$1.00	1-3	\$0.50 to \$3.00

NYC College Senior, 2005

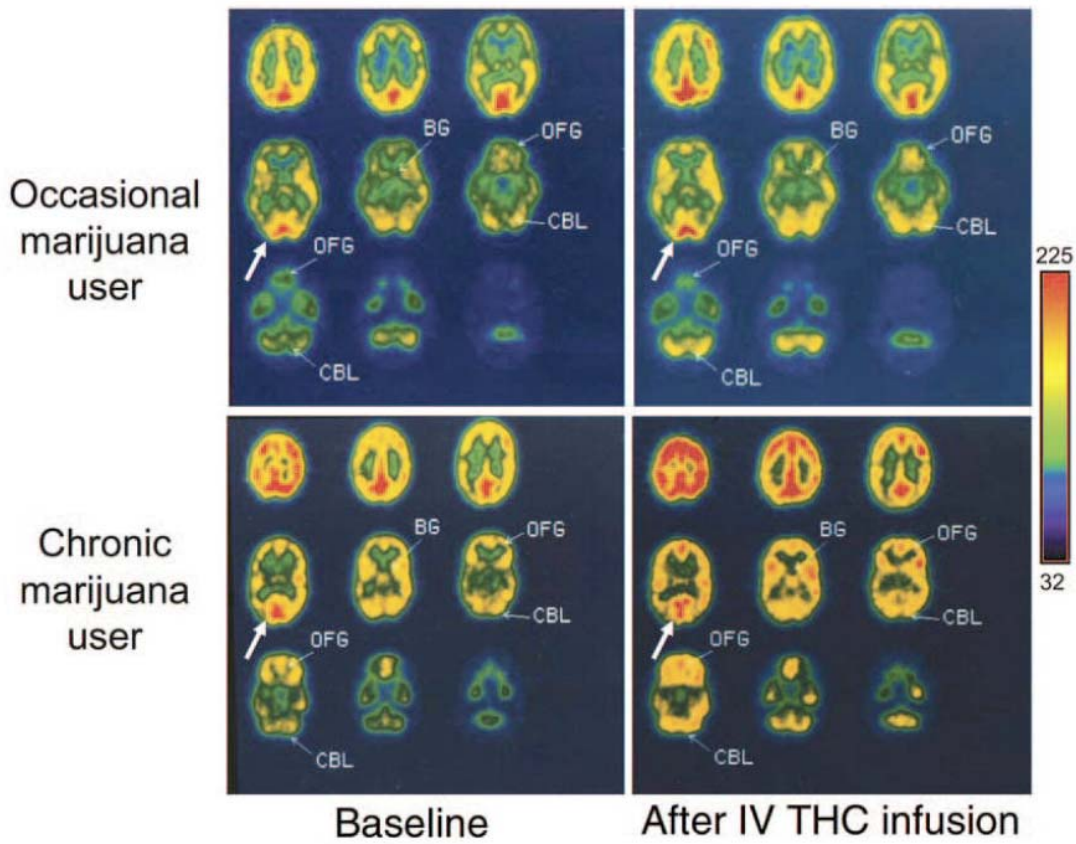
Acute Effects of Smoked Marijuana

- Euphoria, relaxation
- Intensity of perception
- Distortion of time and space
- Appetite stimulation, “munchies”
- Pain reduction in central pain (e.g. MS) and in some HIV peripheral neuropathy
- No death by overdose

Cohen, BMJ. 2008; 336; pp 167-168; Ashton B J Psych 2001.



Major sites of marijuana action in central nervous system



THC infusion -> greater glucose metabolism increase in chronic users (adapted from Volkow, 1996; cited in Chang, 2007)

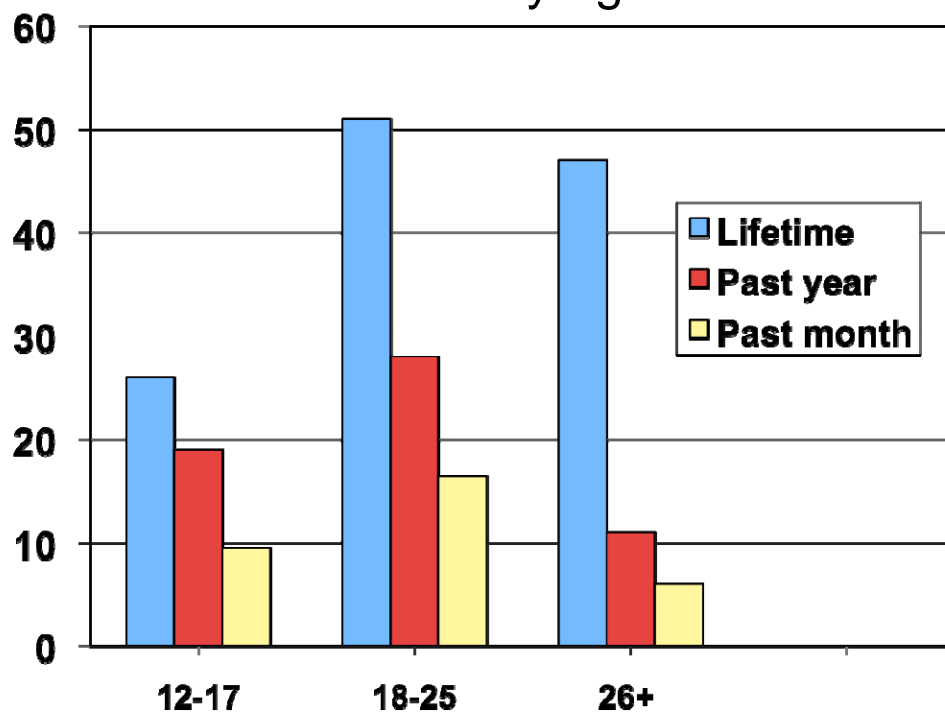
Endogenous Cannabinoid System

- Receptors in CNS (CB1) and immune cells (CB2)
 - CB1 - Neurons “fine tune” incoming inputs
- Pharmacological effects - appetite and feeding, memory, nociception, motor coordination *Pertwee, 2005*
- ECS noted in diseases - ALS, multiple sclerosis, cardiogenic shock, obesity, embryonic implantation, hemorrhagic cystitis (rat models), prostate cancer (?)
Pertwee, 2005

Epidemiology

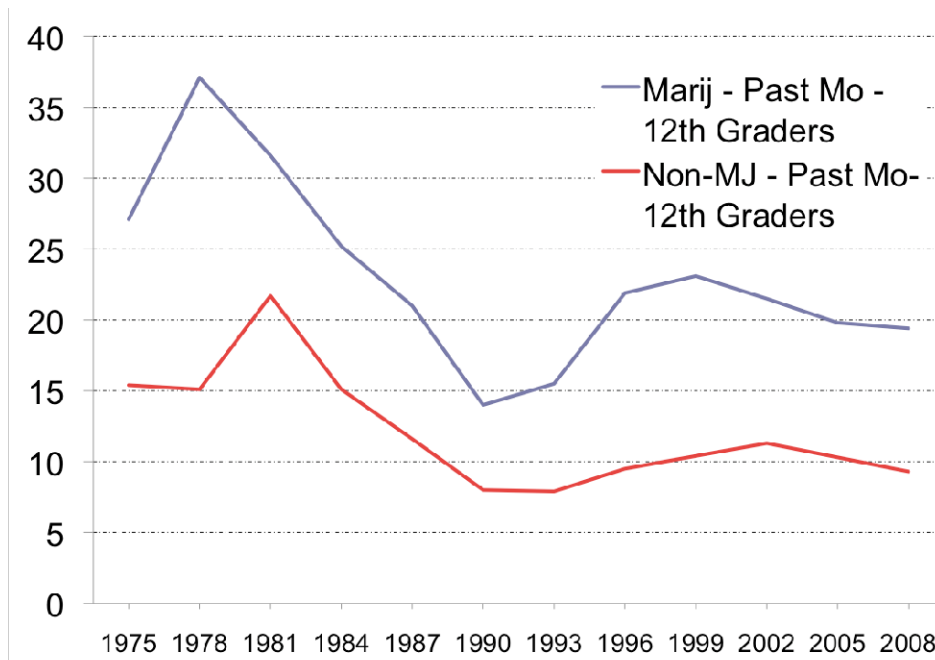
- Lifetime use
- Changes over 10-15 years
- Changes in Abuse/Dependence

Marijuana Use in Lifetime, Past year, Past month by age



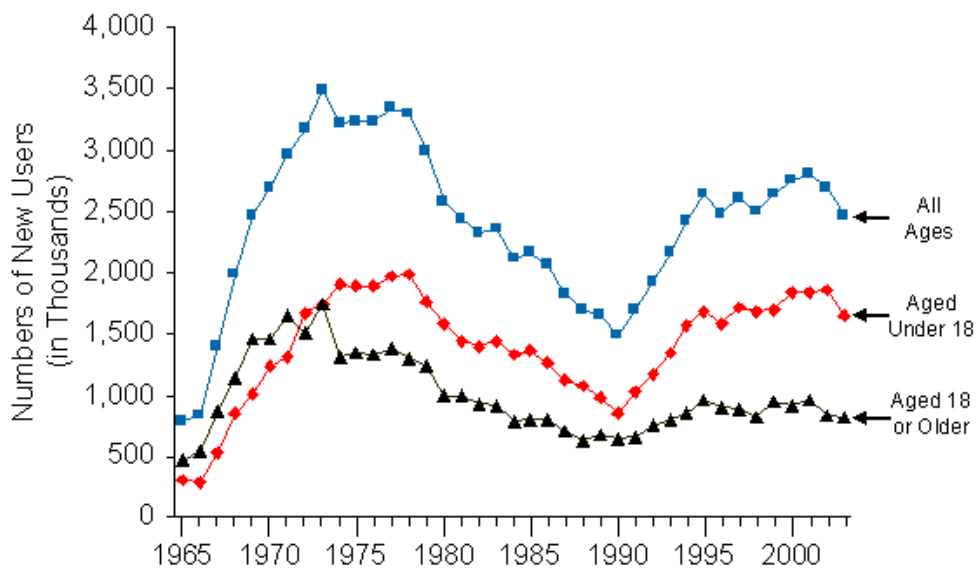
National Survey on Drug Use and Health, 2007

Past-Month MJ Use, 12th Graders



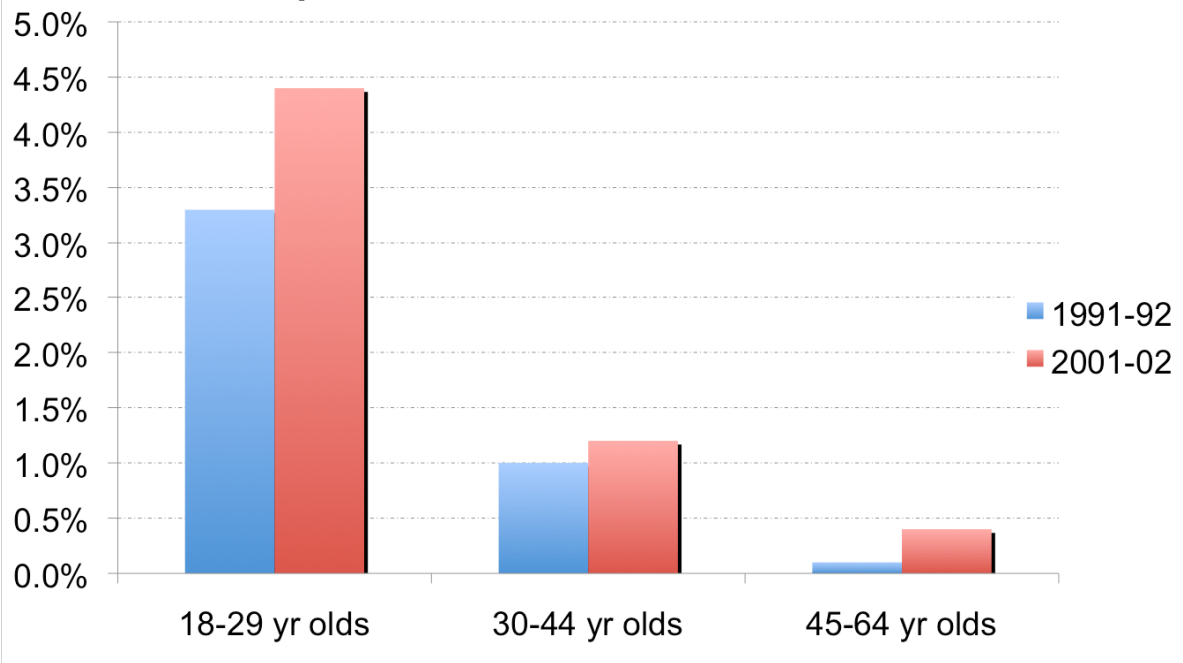
<http://www.monitoringthefuture.org/data/08data/pr08t17.pdf>

Annual Numbers of New Users of Marijuana: 1965-2003



National Survey Drug Use & Health, 2002

Prevalence of DSM-IV Marijuana Abuse/ Dependence, 1991-92 versus 2001-02



Compton WM. JAMA; 2004; 291: 2114-2121

Acute Effects of Smoked Marijuana

- Euphoric effects
- Acute dysphoria *Fant, 1998*

Cognition, brain function

- Transient acute effects on episodic memory & learning *Curran, Psychopharm 2002*
- Motor & Visual tracking (driving) x 2-5 hrs *O'Kane 2002*
- Effects of longer-term use on cognition
 - Adolescents: slower psychomotor speed, complex attention, planning/sequencing after abstinence x 3 weeks *Medina 2007*

Cannabis and psychosis

- Biologically plausible (DA release)
- Multiple epidemiologic cohort studies:
 - risk for symptoms & schizophrenia

But:

- Base rate low
- Risk nonuniform: prior psychotic sx, genetic risk, early adolescent use *Semple, J Psychopharm 2005*
- If prevalence rose 5x since 1970, why didn't schizophrenia rise 5x? *MacLeod Lancet 2005*

Cannabis and Other Effects

- Pulmonary: Tar has carcinogens/tar; appears to cause symptoms of bronchitis, but not pulmonary function decline *Tetrault 2007*
- Depressive symptoms: modest data
- Reproductive effects clearly adverse in males (hormonal alterations, adverse sperm function effects)

Can It Be *Medically Useful*?

- **Possible:** Anti-emetic, Appetite stimulant, Pain control (central), Anxiolytic, Glaucoma –mild decrease intraocular pressure, ?ALS
 - Research small in quantity or quality
- Dronabinol (Marinol) is legal, but its relative effects vs marijuana is greatly contested
- The federal government *may* prosecute in any state, regardless of whether there is a medical marijuana law (*U.S. Supreme Court, 2005*)

<http://medicalmarijuana.procon.org/viewresource.asp?resourceID=000884>

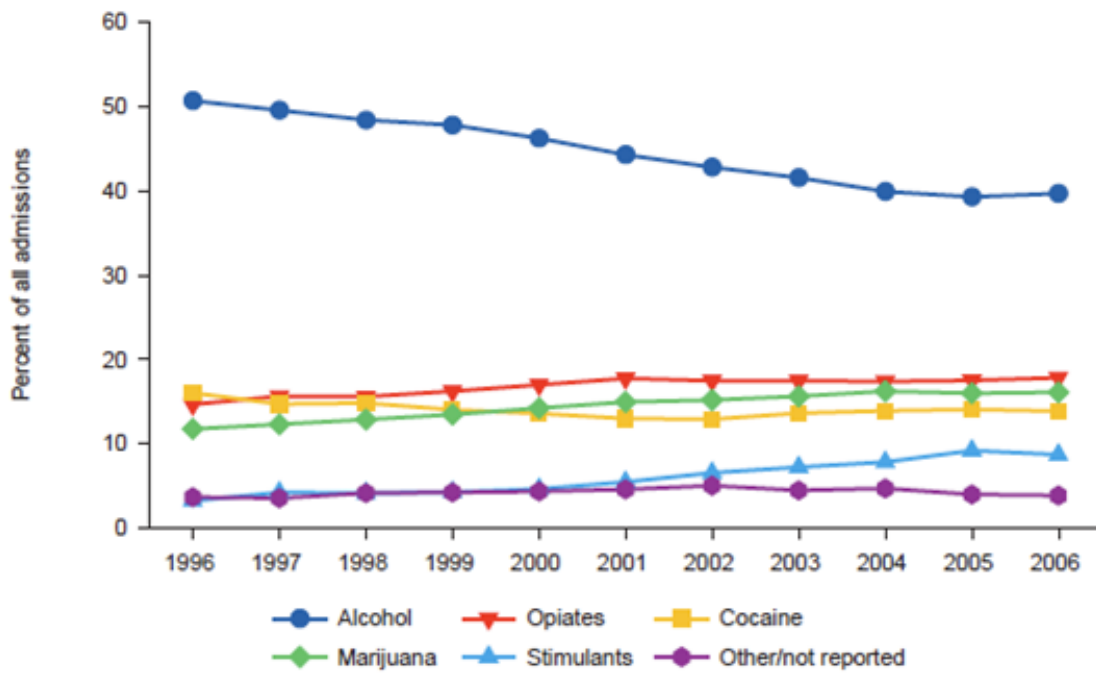
Dependence and Withdrawal

- Withdrawal is real
 - Insomnia, craving, anorexia, irritability, anxiety
 - Onset 8-10 hours after d/cing drug; 4-14 days' duration *Budney, 2003*
- Conditional dependence:
 - 9% for mj, vs 17% for cocaine
- Chronic use → tolerance (noted to be protective in alcohol intoxication) *Wright, 2002*

Early life use, later problems?

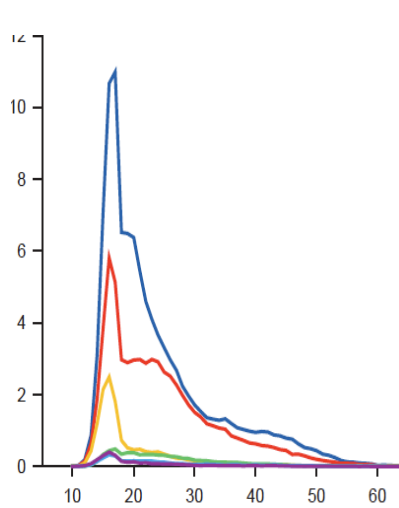
- The DEBATED **Gateway** to other drugs *Kandel 2003*
 - Sequence (Yes),
 - Association (Yes),
 - Causation (Maybe)
 - Even if NO causation, policy/clinical focus on young marijuana users as being at risk remains relevant
- Psychosis
- Educational Attainment, Other Drug Use *MacLeod 2005*
 - High quality cohort studies (n=16)
 - Alcohol and tobacco had similar associations

Drug Treatment: Primary substance of abuse at admission *TEDS 1996-2006*



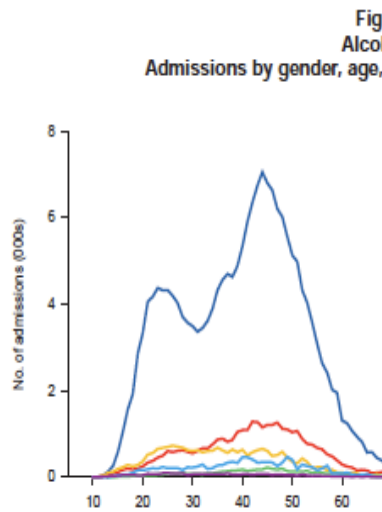
<http://www.dasis.samhsa.gov/teds06/teds2k6aweb508.pdf>

Age at Treatment Admission by Primary Substance (Males, 2006, TEDS data)

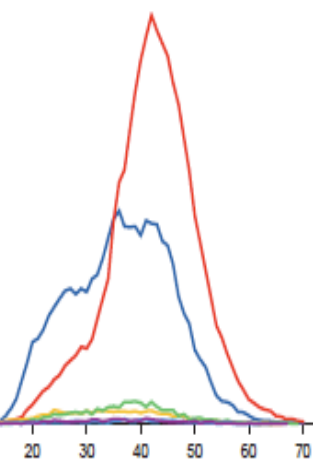


Marijuana

(often secondary substance, not shown)



Alcohol



Cocaine

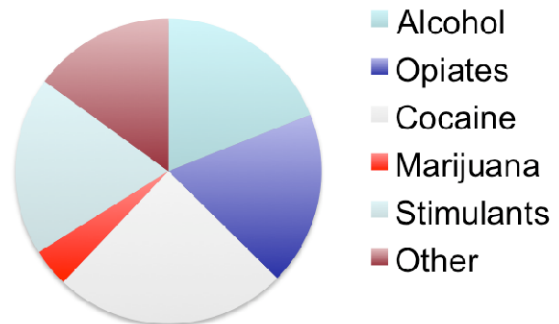
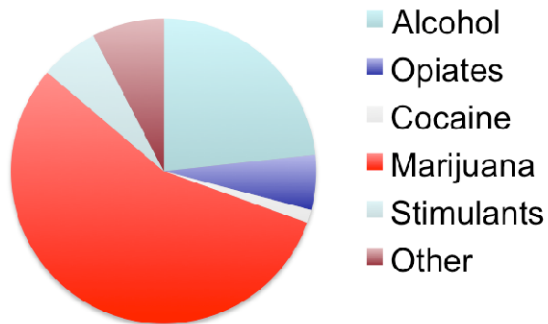
(often secondary, not shown)

Substance Abuse and Mental Health Services Administration, Treatment Episode Data Set (TEDS), Data received through 10.9.07

Admissions by primary substance of abuse

15-19 yrs (n=187,534)

35-39 yrs (n=234,773)



SOURCE: Office of Applied Studies, Substance Abuse and Mental Health Services Administration, Treatment Episode Data Set (TEDS). Data received through 10.9.07.

Treatment Referral Sources

	Referred by Criminal Justice	Referred by Self
Marijuana	58%	15%
Alcohol	36-43%	28-32%
Cocaine	28-36%	30-38%
Methamphetamine	55%	21%

SOURCE: Office of Applied Studies, Substance Abuse and Mental Health Services Administration, Treatment Episode Data Set (TEDS). Data received through 10.9.07.

What can you tell your patients?

- Use rose from early 90s nadir, and levelled
- Use is not so safe
 - Addiction is real; conditional dependence low
 - Cognitive, Respiratory, Reproductive effects
- Medical complications can happen
- The gateway association is present (?causal)
- There is a psychosis risk, esp in adolescence
- Death by OD is not reported

Fact or Fiction

- Teen MJ use is increasing
- Marijuana is safe
- Marijuana is a “gateway” drug
- Marijuana causes madness