SI Community of Concern
Adolescents and Substance Abuse
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Special Thanks: Dr. Mietus-Snyder
Rethinking “Rites of Passage”

What you know is nothing little man;
what you need to learn, immense

Charles Dickens
Alcohol, Drugs and Adolescents

► Prevalence/ Behavior
  ▪ What’s happening, where, how frequently?

► Statistics
  ▪ Apply to us! Not just someone else...

► Science
  ▪ Effects of Alcohol and other drugs on Brain physiology
Re-thinking the “Rites of Passage”
"In the United States, approximately three-fourths of all deaths among persons aged 10--24 years result from only four causes:

- motor-vehicle crashes
- other unintentional injuries
- homicide
- suicide

Morbidity & Mortality Weekly Report (MMWR), Centers for Disease Control, Risk Youth Behavior Surveillance.
Excessive alcohol consumption

- Contributes to approximately 4,700 deaths among underage youths in the United States each year

  - homicides, motor-vehicle crashes, and suicides
  - average *60 years of life lost*, per death

CDC. Alcohol-related disease impact (ARDI).
Although Drinking by underage persons (<21 years) is illegal in every state 

Youths (12-20 years) drink nearly 20% of all the alcohol consumed in the United States

Alcohol Use Among High School Students --- Georgia, 2007

► 37.7% reported current alcohol use
► 19.0% reported binge drinking in the past 30 days
  - Liquor was the most prevalent type of alcohol usually consumed overall (43.7%)
  - Beer was the second most prevalent type of alcohol
    ◦ usually consumed by male students (24.3%)
  - Malt beverages* were the second most prevalent type of alcohol
    ◦ usually consumed by female students (24.1%).
    ◦ *Smirnoff Ice, Bacardi Silver, or hard lemonade, wine coolers

Alcohol Use Among High School Students

Where do they drink?
- 58% reported that their usual location of alcohol consumption was at another person's home
- 29% reported at their own home

37% reported that their usual source of alcohol was someone giving it to them
40% of the nation's underage drinkers are provided free alcohol by adults aged ≥21 years.

The influence of substance use on adolescent brain development.

Effects of alcohol and combined marijuana and alcohol use during adolescence on hippocampal volume and asymmetry.
- Department of Psychiatry, University of California, San Diego, CA, USA

Neurotoxic effects of ecstasy on the thalamus.

Diffusion abnormalities in adolescents and young adults with a history of heavy cannabis use.
- J Psychiatr Res. 2009 Jan;43(3):189-204.
The Teen Brain: A Work in Progress

Grey matter peaks at ~10-12 y then declines in mass throughout adolescence


White matter simultaneously increases in mass as new circuits connect

Ashtari, Neuroimage (2007)
Adolescent Brains

- Drug and alcohol exposures while a brain is still growing make indelible changes in brain circuits that can affect behavior for life.

- Neurotransmission
  - Dopamine/ Serotonin
    - Pleasure/ Reward
    - Addiction/ Cravings (hunger)

- Areas of Rapid Brain Development
  - Frontal Lobes = Reason/ Judgment/ Decision-making
  - Hippocampus = Memory
  - Most Vulnerable to toxic effects
Frontal Lobes

- motor function
- problem solving, spontaneity
- memory, language
- judgment, impulse control, initiation
- social and sexual behavior
Drugs and Alcohol Increase Brain Dopamine and Serotonin

- Some mimic dopamine and serotonin
  - LSD
- Many cause excessive dopamine release
  - Alcohol, Marijuana, Amphetamines, Heroin/Opiates
- Some cause excessive serotonin release
  - Ecstasy, GHB
- Some prevent normal dopamine and serotonin reuptake
  - Cocaine, Methamphetamines
- Others prevent the breakdown of dopamine
  - Nicotine
Frontal Lobe Brain Dysfunction in a Young Drinker

20 yo non-drinker

20 yo regular drinker
Hippocampus (Memory) Volume Shrinks with Teenage Alcohol Use

Non-drinking adolescent

Adolescent binge drinker

American Journal of Psychiatry, 2000;157:737
Do you know where your prescription drugs are?

Chances are your teen does.
Do you know where your prescription drugs are?

- Pot, alcohol, steroids, cigarettes, meth, Ecstasy and LSD
  - used less and less by American teenagers since the 1990s
- Abuse of prescription medications has been on the rise
- Less Stigma ("medicine" vs. "street-drugs")
- Easy to find at home
Commonly Used/ Abused Prescription Medications

► Vicodin/ Oxycontin*  *$40/pill  street value
  ▪ more popular than Ecstasy/ Cocaine among High School seniors

► Ritalin/ Adderall (ADD)

► Xanax/ Valium (Anxiety)

► Secure your medications and know how many pills you have!
Growing Brains are Vulnerable

- The brain keeps growing, developing new neurons, and setting up circuits into the 20's

- Substance abuse in adolescence is more likely to lead to addiction
  - 1 in 3 adolescents who smoke,
  - 1 in 4 adolescents who drink,
  - 1 in 5 adolescents who use marijuana...
    ...will become dependent on the drug

- Even if one escapes addiction, drugs put the brain at risk for chronic changes that can affect function
Re-think the “Rites of Passage”

► Overwhelming evidence that substance abuse during adolescence causes
  ▪ Deleterious effects on the brain
  ▪ Statistically increased risk of early death/ injury
  ▪ We know more now than our parents did

► Adolescence is NOT adulthood
  ▪ Brain not hard-wired
  ▪ Lack insight and experience
  ▪ Be a parent until they leave home (and maybe after!)

► Zero-tolerance to Drug and Alcohol consumption
Resources

► www.adolescent-substance-abuse.com
► www.drugabuse.gov
► www.ncalcc.org/