# Epidemiology of Adolescent Substance Use Disorders

Dr. Rebekah Smith MD

rmsmith@salud.unm.edu

# Disclosure

- The presenter has no financial relationship to this program.

# Objectives

At the end of this presentation, participants will be able to:

1. Create an overview of substance use disorders.
2. Explain significance of substance use and comorbid risks/conditions in adolescents.
3. Examine national and local data about substance use trends.

# Overview

- Definitions
- Diagnosis
- Etiology
- Comorbidity
- Risk Factors
- Behavioral Variants
- National rates
- NM specific rates
- Trends & Implications
- References

# Definitions:

- **<u>Substance Use Disorder</u>**:
  - "a problematic pattern of using alcohol or another substance that results in impairment in daily life or noticeable distress." -DSM5
  - "a cluster of cognitive, behavioral, & physiological symptoms, indicating that a person keeps using a substance, despite significant associated problems." -Dr Mullen

- **<u>Abuse</u>**: used to refer to substance use at a level below dependence. *No longer a DSM diagnosis.*

- **<u>Dependence</u>**: still refers to physiologic tolerance & withdrawal. *No longer a DSM diagnosis.*

- **<u>Addiction</u>**: Term is loosely used in common vernacular, but specifically refers to a combination of Physiologic Dependence + Maladaptive Drug-Seeking Behaviors. *Not a DSM diagnosis.*

# DSM5 Substance Use Disorder "SUD"

DSM-5 SUD criterion (need >2/11 minimum):

1. Taking **larger amounts** or for **longer** than intended
2. Not able to **cut down or quit**
3. Substantial **time** getting, using, or recovering
4. **Cravings** & urges
5. Impaired **performance** / attendance (work, home, or school)
6. Impaired **relationships**
7. Missed interests (sig social, occupational, recreational activities)
8. Continued use, despite danger
9. Continued use, despite known physical or psychological problems
10. Physiologic **tolerance** (needs more to have effect)
11. Physiologic **dependence** (**withdrawal** sx, alleviate by using again)

SEVERITY Specifiers:

- Mild: 2-3 criteria
- Moderate: 4-5 criteria
- Severe: >6 criteria

REMISSION Specifiers:

- Early Remission
- Sustained Remission
- Partial Remission
- Full Remission
- Maintenance Therapy
- In a Controlled Environment

CATEGORIES:

- Alcohol (Ethanol)
- Tobacco (Nicotine)
- Cannabis (Marijuana)
- Stimulant (Meth, Cocaine)
- Hallucinogen (LSD, psilocybin)
- Opioid (heroin, morphine, etc)

# Etiology

*Why do we care about etiology? Screening for comorbidities. Predicting prognosis. Developing treatment plans.*

- GENETICS:
  - Substantial commonality b/w highly heritable disinhibitory / externalizing disorders (eg ASPD) and SUD vulnerability
  - Impulsivity: prioritizing immediate rather than delayed consequences (discount the future), ability to inhibit urges
  - Compulsivity: irresistible urge to act, generally referring to a stereotyped or predictable pattern of behavior

- FAMILY & PEER: modeling, social pressure, herd mentality, normalization, coping c social stressors

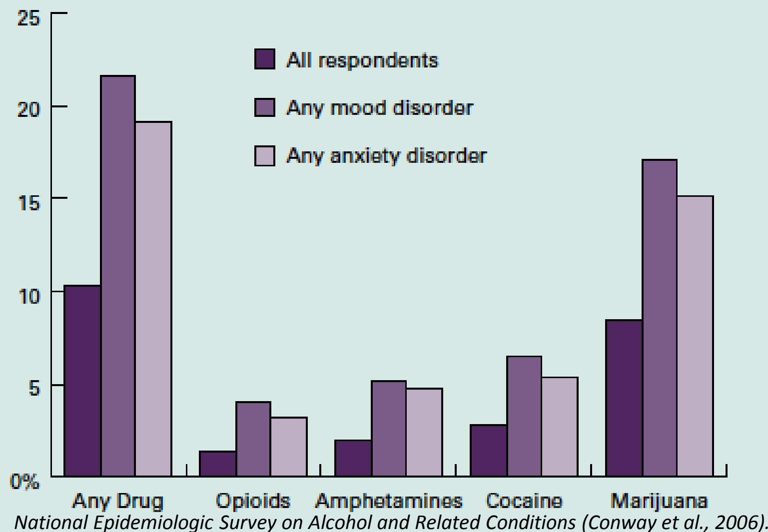
- AGE: early onset & rapid progression predicts severity

- STAGE: experimentation or “occasional dabbling” → regular use → preoccupation or “compulsive use”

- NEUROBIOLOGY:
  - Location: stimulate reward system (dopamine in ventral tegmental area & nucleus accumbens, assoc c amygdala).
  - Neurotransmitters: many. opioid peptide, dopamine, GABA, 5HT / 5HIAA, endo-cannabanoids (eg andandamide)

*Referencing Dr Mullen & Crumley lecture notes, including on Stahl chapter #14*

# Comorbid / Dual Diagnoses



National Epidemiologic Survey on Alcohol and Related Conditions (Conway et al., 2006).

"Among adolescents in treatment studies, more than 60% have comorbid substance use and non-SUD with more than 50% having a conduct disorder and 15% having major depression or ADHD." Grella, Hser, Joshi, & Rounds-Bryant et al., 2001).

- ADHD
- Conduct Disorder
- Personality Disorders – Antisocial, Borderline
- Social Anxiety & Other Anxiety Disorders
- PTSD
- Bipolar Depression
- Unipolar Depression
- Psychotic Disorders

Peer Normative or "developmentally appropriate experimentation" – *this can be controversial – what do you think? – see what the literature says*

Maladaptive Behaviors: youth violence, delinquency, school dropout, risky sexual behaviors, and teen pregnancy (NIDA cites common risk factors for these and SUDs)

# Comorbidity – SAMHSA 2013

- **In 2013, 1.4% of adolescents had a co-occurring MDE and a substance use disorder.**
- Half of adult mental illness begins before the age of 14, and three-fourths before age 24.
- >40% of youth 13-17yo have experienced a behavioral health before 7$^{th}$ grade.
- **Suicide** is the 3$^{rd}$ leading cause of death among youth 15-24yo (after accidents & homicide).
- Adverse outcomes of mental illness include: homelessness, arrest, school drop-out, unemployment, disability (CMI is #1cause in youth).
- **1.3 million or 5.2% of U.S. adolescents (12-17yo) has a substance use disorder**
- Past-month illicit drug use was 2.6% in 12-13yo, 7.8% 14-15yo, 15.8% 16-17yo, 22.6% 18-20yo, 20.9% 21-25yo
- 1/10 youth 12-17yo had a major depressive episode (MDE) in past year – **only 38.1% had treatment or counseling**
- 1/5 youth 18-25yo reported a mental illness in past year; 3.9% were diagnosed with a serious mental illness.

# Risk Factors for SUDs in Teens:

**PROTECTIVE FACTORS**: *for all SUD, per NIDA*

- strong and positive family bonds
- parental monitoring of children's activities & peers
- clear rules of conduct that are consistently enforced
- involvement of parents in lives of their children
- success in school performance; strong bonds with institutions, eg school or religious organizations
- adoption of conventional norms about drug use.

**RISK FACTORS**: *for all SUD, per NIDA*

- chaotic home environments, esp if parents use substances or have mental illness
- ineffective parenting, especially in children with difficult temperaments or conduct disorders
- lack of parent-child attachments and nurturing
- inappropriately shy or aggressive behavior in school
- failure in school performance
- poor social coping skills
- affiliations with peers displaying deviant behaviors
- perceptions of approval of drug-using behaviors in family, work, school, peer, and community environments.

**RISK FACTORS**: *for Alcohol Use, per SAMHSA 2012*

- high levels of impulsiveness, novelty seeking, and aggressive behavior
- having conduct or behavior problems
- a tendency to NOT consider the possible negative outcomes of actions.

**Epidemiology &Treatment of Substance Use and Abuse in Adolescents |** Psychiatric Times 2013

1. “**Experimentation is a normal behavior during adolescence; however, drug use is not,** nor is the transition into drug problems. Experimentation with drugs and alcohol is fraught with risks and should be discouraged. Particularly, data suggest that the younger the age that substance use is started, the higher the risk for substance dependence.

2. “**Drug use starts primarily as a social behavior**, concurrent with the social reorientation from family to peers that takes place during adolescence.

3. “The adolescent brain undergoes unique changes that contribute to enhancing **impulsivity and risk-taking behaviors**, which are vulnerabilities for substance use.”

**Epidemiology & Treatment of Substance Use and Abuse in Adolescents |** Psychiatric Times 2013

Table – Prevalence of substances used most frequently by 12th and 8th graders during the past year (categories not mutually exclusive)

| Among 12th graders | | Among 8th graders | |
|---|---|---|---|
| **Substance** | **%** | **Substance** | **%** |
| Alcohol | 63.5 | Alcohol | 26.9 |
| Marijuana/hashish | 36.4 | Marijuana/hashish | 12.5 |
| Synthetic marijuana | 11.4 | Inhalants | 7.0 |
| Amphetamines[a] | 8.2 | Amphetamines[a] | 3.5 |
| Vicodin[a] | 8.1 | Cough medicine[a] | 2.7 |
| Adderall[a] | 6.5 | Hallucinogens | 2.2 |
| Salvia | 5.9 | Vicodin[a] | 2.1 |
| Tranquilizers[a] | 5.6 | Tranquilizers[a] | 2.0 |
| Cough medicine[a] | 5.3 | OxyContin[a] | 1.8 |
| MDMA (ecstasy) | 5.3 | Hallucinogen other than LSD | 1.8 |
| Hallucinogens | 5.2 | MDMA (ecstasy) | 1.7 |
| OxyContin[a] | 4.9 | Adderall[a] | 1.7 |
| Sedatives[a] | 4.3 | Salvia | 1.6 |
| Inhalants | 3.2 | Cocaine (any form) | 1.4 |
| Cocaine (any form) | 2.9 | Ritalin[a] | 1.3 |
| LSD | 2.7 | LSD | 1.1 |
| Ritalin[a] | 2.6 | Crack | 0.9 |
| Ketamine | 1.7 | Ketamine | 0.8 |
| Provigil[a] | 1.5 | Methamphetamine | 0.8 |
| GHB (γ-hydroxybutyric acid) | 1.4 | Rohypnol | 0.8 |
| Methamphetamine | 1.4 | Heroin | 0.7 |

[a] Non-medical use.

# Alcohol & Underage Drinking

**Prevalence of Alcohol Use:** *per SAMHSA 2012*

- 9 million youth (or 25% of 12-20yo) reported drinking in past month
- More teens use alcohol than tobacco or other drugs.
- Teens drink less frequently but larger volumes than adults (6 million youth report >5drinks in a sitting in 2012, in 2013 29% of 18-20yo's reported binge drinking)

**Demographics of Alcohol Use:** *per SAMHSA 2012*

- **Geography**: **NE 28%**. MidWest & W 25%. S 22%.
- **Ethnicity**: 14% Asian-A. 18% African-A. 22% multi-racial. 22% A-Indian / AK Native. 23% Hispanic. 27% **Caucasian**
- **Socialization**: 80% drink with group, 14.5% drink with >1 other person, 5.5% drink alone

Per 2012 National Survey on Drug Use and Health (NSDUH) 135.5 million (52.2%) of Americans >12yo reported being current drinkers of alcohol, and of these ~ 18 million have an AUD. Many Americans begin drinking at an early age. In 2012, about 24% of eighth graders and 64% of twelfth graders used alcohol in the past year.

**Impact of Underage Drinking:** *per SAMHSA 2012*

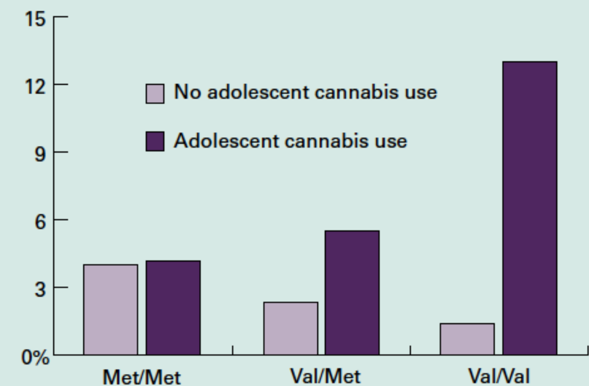
- **DEATH:** Results in >4,300 annual deaths among youth
- **INJURY**: Associated c 189,000 ER visits (injuries & other) among youth, and ensuing medical problems at older ages

**Increases the risk for:**

- "risky sexual behaviors" including unwanted, unintended, unprotected sexual activity, sex with multiple partners
- legal problems (eg arrest for DUI, assault)
- physical and sexual assault
- suicide and homicide
- memory problems and other changes in brain development (can include life-long effects)
- developing "heavy drinking" later in life - teens who start very early <15yo are 5X likely to develop adult disorders than teens who wait
- using and misusing other drug

# Cannabanoids

- THC / CBD vs synthetics
- 12.5% of 8th graders and 36% of 12th graders used marijuana in last year (7% and 11% respectively report synthetic use in same time period)
- 6.5% high school seniors use marijuana daily (per Board Vitals citing 2012 study)



# Other Substances

- Opioids – especially Rx eg oxycodone
- Stimulants – meth, cocaine
- Robo-Tripping – Robitussin, OTC cold & sleep meds, etc
- Skittle Parties – mixed / unknown ingestions
- MDMA – ecstasy
- Mushrooms / psilocybin
- Huffing – aerosolized inhalants (eg metallic spraypaint)

# New Mexico Numbers

*Data: NIH NIDA & NM DOH Dr Brad Wharton, updated Nov 2013*

**NM Drug Overdose Deaths (all ages)**

- Local drug OD deaths are **very high** (#2 in the nation in 2010, 521 total for NM in 2011, or 29.6 per 100k)
- Local drug OD deaths are **on the rise** (increased 66% in Bernalillo County in 2011)

Local Trends:

- **Trending up**: overdose c prescription opioids (oxycodone is most commonly prescribed), methocarbamol (robaxin), synthetic cannabanoids (spice). Harm reduction efforts. Successful use of naloxone reversal. Calls to poison control re stimulants, methocarbamol, synthetics.
- **Stable**: meth overdoses. Sale of Rx opioids (<1% increase in ABQ).
- **Trending down**: overdose c cocaine, heroin, benzos, other prescription psychotropics (antidepressants, antipsychotics). Inpatient treatment specific to overdose. Heroin treatment admissions. Total calls to poison control center, calls re soma.

**NM "Youth Drug Use"**

- According to the Youth Risk & Resiliency Survey, drug use is declining for all substances, but remains high. Among local high schoolers:
  - 26.5% have used marijuana in past month
  - 10% have used painkillers to get high
  - 6% currently use inhalants
- According to the National Survey of Drug Use & Health:
  - 11.4% kids >12yo currently use marijuana
  - 6% kids >12yo currently report nonmedical use of prescription pain relievers.

# Local News:

The parents of Hannah Bruch are blaming the state and others for her death.

Bruch, 14, died after taking the pure form of ecstasy known as “Molly.” She then attended the event which was supposed to be for those 16 and older.

In this lawsuit filed this week, Bruch’s parents are suing Expo New Mexico, the concert promoters, the event security company and paramedics who were at the event.

For annual DOT reports on DWIs, go to [http://www.dgr.unm.edu/reports_dwi.html](http://www.dgr.unm.edu/reports_dwi.html)

“41.8 percent of all crash fatalities occurred in alcohol-involved crashes in 2012.” (this includes mixed alcohol & drug use, but not drug only use which is more difficult to determine at the scene of the accident, but is considered to be trending upwards).

Risk factors: male drivers, ages 20-34, lack of seatbelt use, rural non-interstate roads

# Implications of Epidemiology

- Trends – what's changing and why (or why not)?
- Funding & Access to Care – federal, state, organizational, etc
- Programming & Policy – who's doing what, and how is it working?

## SAHMSA:

*"Improving access to behavioral health services for children, youth, and their families is one of SAMHSA's core missions. Children and youth are viewed and understood in the context of their families, their communities, and their cultures. SAMHSA works to promote systems of care that involve parents in treatment planning and decisions for children:"*

1. Building Blocks for a Healthy Future is a website where parents, caregivers, and educators can find great tips and tools that help children make healthy decisions as they grow up.

2. National Children's Mental Health Awareness Day raises awareness about the importance of emphasizing positive mental health as part of a child's overall development from birth.

3. The Safe Schools/Healthy Students initiative is a program designed to prevent violence and substance abuse among our nation's youth, schools, and communities.

4. Learn more about SAMHSA programs that address underage drinking at the Underage Drinking topic.

# References


- SAMHSA
  - http://www.samhsa.gov/specific-populations/age-gender-basedNIDA
- National Institute on Drug Abuse (NIDA):
  - NIDA Risk Factors – **Vol. 16, #6** (February 2002) - http://archives.drugabuse.gov/NIDA_Notes/NNVol16N6/Risk.html
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- *National Epidemiologic Survey on Alcohol and Related Conditions (Conway et al., 2006).*
- Psychiatric Times:
  - http://www.psychiatrictimes.com/addiction/epidemiology-and-treatment-substance-use-and-abuse-adolescents
- Dr Mullen & Crumley lecture(s), referencing Stahl Ch 14: impulsivity, compulsivity, addiction
- Local News: http://krqe.com/2015/08/05/lawsuit-filed-in-teens-death-at-a
- DOH / MVA data: http://www.dgr.unm.edu/reports/annual/ar2012.pdf
- National Epidemiologic Survey of Alcohol and Related Conditions (NESARC) data


*In the United States, estimates of adolescent substance use behaviors and attitudes primarily come from 3 population-based national surveys:*

1. *the Monitoring the Future (MTF) study of 8th, 10th, and 12th graders and linked longitudinal follow-up studies;*
2. *the National Survey of Drug Use and Health (NSDUH) study of those aged 12 and older; and*
3. *the Youth Risk Behavior Survey of adolescent students.*[1-3]