Adolescent Substance Use: Current Advances in Science & Effective Interventions

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Objectives: Topics to be Covered

• **Who** are we talking about?
  • Developmental period and SUD Risk

• **What** are risk factors for adolescent SUDs?
  • Brain development and socialization patterns

• **Why** should Tx folks worry?
  • Implications for SUD risk issues - Motivation

• **Where** are we headed?
  • Effective approaches to address adolescent SUD risk issues— MI
    (Dr. Elizabeth D’Amico, RAND)
Who are we talking about?

Adolescents

- Minors
- Youth
- Young People

Age range: 12-17

Developmental period characterized as transitional phases associated with “growing or maturing.”

What’s involved with this process?
Research supports that this period is a time of:
- Emotional maturation
- Identify formation
- Life skills development
- Risk-taking behavior: 5’s…

<table>
<thead>
<tr>
<th>Adolescent 5 S’s</th>
<th>Caregiver/Provider 5 S’s</th>
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<tr>
<td>Social Media</td>
<td>Safety</td>
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<tr>
<td>Speeding</td>
<td>Spirituality (seeking purpose &amp; meaning)</td>
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<td>Sex (Sexting)</td>
<td>Success</td>
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<td>Spending</td>
<td>Saving</td>
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<td>Substance Use Experimentation</td>
<td>Security</td>
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Developmental Research Supports: Adolescents are an At-Risk Population for SUDs...

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<tr>
<th>Zero Use</th>
<th>Experimentation</th>
<th>Social/Recreational Use</th>
<th>Misuse</th>
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| MANY youth do not use. | Some youth experiment with drugs and alcohol, which is common among adolescent. They try it but don’t continue. | Youth who use at a party, on occasion, not in excess, no pattern or misuse, responsible (not drinking/driving, not “wasted”). | Beginning to use to manage negative thoughts and/or feelings, using to replace boredom, stress, fears, trying to fit in...

Longitudinal Research shows adults with SUDs started using during adolescence.
What Substance Use Patterns Should we be Concerned about?

8th Graders

- Marijuana/Hashish: 11.7%
- Synthetic drugs
- Cocaine
- MDMA

12th Graders

- Marijuana/Hashish: 35.1%

MARIJUANA WHY NOT?

SAMHSA, 2014; MTF 2014
Research has identified important Developmental Risk Factors linked to the onset of SUDs.
Risk Factors associated with Onset of Adolescent SUDs

- **Family**
  - Low Parental Monitoring
  - Low Affection
  - High Conflict

- **School**
  - Low School Involvement
  - Poor Academic Performance

- **Peer**

- **Neighborhood Advertising**
  - Access/Availability; Norms

- **Indiv Factors**
  - Low Parental Monitoring
  - Low Affection
  - High Conflict

- **Positive Social Norms**
  - Acceptance
  - Normal
  - Legal – Safe

- **Youth Culture**

How are adolescents interpreting environmental situation with MJ policies/advertising?
Adolescent Behavior is Complex

Key factors of influence

- Peer Approval
- Sibling use
- Best Friend Use
- Adult Use
- Advertising
How is advertising affecting use?

- Rand conducted a survey among 16 middle schools in southern California (n= 8214; 50% male; 52% Hispanic; mean age = 13).
- Assessed exposure to advertising for medical marijuana and effects on marijuana intentions → “use”
Findings?

• Greater medical marijuana advertising exposure associated with:
  • Stronger intentions to use one year later
  • Higher probability of marijuana use

What are intentions influenced by?

Perceptions of RISK
Research Supports an Inverse Relationship between Perceived Risk and Marijuana Use

Volkow, Baler, Compton, & Weiss, NEJD, 2014
Support for marijuana legalization in the U.S. has reached unprecedented levels.

- **65%** Millennial (born 1981-now)
- **54%** Gen X (born 1965-1980)
- **50%** Boomer (born 1946-1964)
- **32%** Silent (born 1928-1945)

Percent favoring legalization, by generation

Generational lines shown when significant sample is available.
What’s the Motive?

Among people who used marijuana in the past year:

- 47% used for fun
- 30% used for medical reasons
- 23% used for fun and for medical reasons

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**Peers**
- +

**Indiv Factors**
- Personality
- Values, Beliefs

**SUD Risk Behavior**

**The Developing Brain**

What ultimately directs behavior?
What do these factors interact with?
Research supports that the adolescent period is a time of profound brain maturation.

- Maturation process occurs from back to front and is not complete until age 24
- Major processes of the brain that are maturing during adolescence that are interrupted by substance use
Adolescent Brain Development - **Mid-Brain**

- Part of the brain that takes in sensory information associated with survival functions, like vision and hearing.
- Environmental settings are getting processed as safe/comfortable.
- Substance use early on affects mid-brain – leading youth...
  - To process alcohol & drug use as “survival mechanisms”
Adolescent Brain Development - *Pre-Frontal Cortex*

- Part of the brain in charge of executive functions (like decision making and self-control)
- Substance use affects PFC functioning – leading youth...
  
  - *To show poor judgment & difficulty with self-control*
Adolescent Brain Development - **Limbic System**

- Part of the brain that regulates emotions and cognitions: [Amygdala & Hippocampus]
- Cognitive Maturation (IQ: age 16) vs. Emotional maturity (age 21) – GAP has been a major player in the addiction process

- Substance use serves to **interrupt** these developing regions– leading youth to:
  - have poor mood regulation &
  - display problems with cognitive functions (attention, memory)
Adol Brain Development: *Nucleus Accumbens*

- Functions to modulate the reward system of the brain - called *dopaminergic pleasure pathway*

- **Driver of Motivation** - When youth do anything rewarding - eat food, ride a roller-coaster, give a like on Facebook, play video-games, have sex - dopamine is released
  - Substance use affects the release of dopamine to significantly higher levels than normal motivating youth to:
    - Continue to seek such extreme pleasure

**Motive?**

Pleasure, Fun, Excitement
Complex Developmental Framework of Adolescent SUD Risk

Why do you do what you do?
Poor Self-Control

Why do you take risks and seek fun/pleasure only?

Emotions/Pain
Why are you so emotional and less practical? Emotions vs. Cognitions

Do you feel comfortable?
Survival/Coping

Survival/Coping
Judgement

Vision

Emotions/Pain

Coordination

Memory

Reward

Judgement

Movement

Sensations
Marijuana Activates (binds) to Cannabinoid Receptors Throughout the Brain

It interferes with brain development/function in a variety of areas:

- Problem solving & decision making
- Self-control
- Working memory
- Emotion regulation
- Coordination
What can we learn from Developmental Implications?

Having Fun
What can we learn from Developmental Implications?

A developmental risk framework is important to consider for addressing adolescent SUD issues.

**Mid-brain:** Organizations (staff/counselors) should provide a safe and warm environment.

**PFC:** Strategies should aggressively promote *skills* for self-regulation.

**Limbic:** Material (and messages) should be framed to address emotions more so than cognitions (feelings not thinking)

**Nucleus Accumbens:** Should incorporate services that are pleasurable/fun (recreation) and incorporate things youth are into (technology)

Targeting **Motivation** is Critical...
**Issues with Adolescents**

- Substance use viewed as a behavior they have personal control over
- Biased perceptions of SUD Risk/Problem

*Decreased motivation to stop using or need for help*
Where are we headed? Effective Interventions