Understanding the Social and Biological Aspects of Adolescent Development and Substance Use Disorders

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Webinar Housekeeping Items

• A recording of this webinar and slides will be posted on: https://idph.iowa.gov/substance-abuse/families-in-focus

• Survey following the webinar and 30-day follow-up

• Approved for 1 hour Substance Abuse Continuing Education Units
Key Questions

• What are the prevalence rates for adolescent substance use and substance use disorders?

• What are important biological and social developmental milestones for adolescents?

• What is the relation between developmental milestones and intervention/treatment for substance use disorders?
Source: Miech et al., 2018: Monitoring the Future
30 Day Use: 12th Grade

Source: Miech et al., 2018: Monitoring the Future
Need and Received Substance Use Treatment in Past Year

- **Adolescents ages 12-17:**
  - 4.1% needed treatment* or about 1 million
  - 0.7% received treatment or about 184K

- **Young Adults ages 18-25**
  - 15.1% needed treatment or about 5.2 million
  - 1.9% received treatment or about 641K

*Met criteria for an SUD or received SUD treatment at specialty facility in past year
Source: SAMHSA 2018: Results from 2017 NSDUH
Why is Adolescent Brain Development Important?

Major Parts of the Adolescent Brain

- **Cortex Area**
  - Prefrontal Cortex

- **Limbic Area**
  - Emotion
    - Amygdala (fear, anger)
    - Hippocampus (new memories)
    - Hypothalamus (hormones)

- **Brain Stem**
  - Keeps us alive

Content Source: Walsh, 2013
Reward Pathway

Activation of the reward pathway by addictive drugs

DRUGS OF ABUSE TARGET THE BRAIN’S PLEASURE CENTER

Brain reward (dopamine) pathways

- Frontal Cortex
- Nucleus Accumbens
- Ventral Tegmental Area

These brain circuits are important for natural rewards such as food, music, and sex.

Drugs of abuse increase dopamine

- Dopamine Transporter
- Dopamine Receptor

Typically, dopamine increases in response to natural rewards such as food. When cocaine is taken, dopamine increases are exaggerated, and communication is altered.

Source: https://www.drugabuse.gov/publications/drugs-brains-behavior-science-addiction/drugs-brain
Adolescent Risk Taking, Impulsivity, and Cognitive Control

- **Risk taking**
  - Engage in sensation-seeking behaviors
  - Engage in more risk-taking than younger or older age groups

- **Impulsivity**
  - Correlates with risk-taking
  - Emotional rather than cognitive process

- **Cognitive Control**
  - Consequential thinking, decision making, problem solving

Source: Boucher & Sandhu (2013)
Puberty
Major Psychological Tasks

- Identity Development
  - Self
    - “How do I see myself?”
  - Others
    - “How do I see others?”
    - “How do others see me?”
  - World
    - “How do I see the world?”
    - “How does the world see me?”
Identity Worksheet

HOW DO I SEE MYSELF?

1. Write 3 words on the line below and in the center circle that describe yourself:

2. Write 1-2 words for each of the categories below and in the outer circle that describe how others see you:
   - Family:
   - Friends:
   - School:
   - Juvenile Justice:
   - Work:
   - Other:

3. Next to each word in the circles above write a "+" or "-" sign indicating if you think the word describes something positive or negative.

“+” or “-”

Source: Burrow-Sánchez et al., 2015
Social Markers of Adolescent Development

• Age-based social markers:
  ▫ 13: Teenager
  ▫ 16: Driver’s License
  ▫ 18: Adult
    • Vote
    • May or may not be eligible for youth/adolescent programming
    • Join Military
  ▫ 21: Use Alcohol Legally
Adolescent Development

Birth 11-13 13-18 19 >

Birth Puberty Adolescence Young Adulthood

5 year old Pre-teen Teen 20 year old

Red/yellow: Less mature
Blue/purple: More mature
Intervention Practices Informed by Adolescent Biological and Social Development

- Prevention is important
  - Prevent substance use or prevent problem from worsening

- Teach about changes in body and brain
  - Developmental growth periods

- Teach emotional regulation
  - Anxiety, anger, and negative moods

- Teach problem-solving and decision-making skills
  - Understanding consequences, choices, and planning of behavior

- Teach influence of contextual pressure
  - Peer pressure
## Ages, Developmental Tasks, & Areas of Intervention

<table>
<thead>
<tr>
<th>Ages</th>
<th>Developmental Tasks</th>
<th>Intervention Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-14</td>
<td>Identity, risk taking/impulsivity, emotional regulation</td>
<td>Emotional regulation, problem-solving, decision-making, peer relations</td>
</tr>
<tr>
<td>15-17</td>
<td>Identity, individuation, connection, exploration</td>
<td>Problem-solving, decision-making, etc.</td>
</tr>
<tr>
<td>18-20</td>
<td>Identity, school-to-work(school)</td>
<td>Goal setting, school and vocation skills</td>
</tr>
<tr>
<td>21-24</td>
<td>Identity, early adulthood</td>
<td>Stability, goal attainment, transitions from school or work</td>
</tr>
</tbody>
</table>
Thank You!!

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