Why Do Teens Behave the Way They Do?

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Point #1:
The Teen Brain Develops in Meaningful Ways
Maturation Occurs from Back to Front of the Brain and Inside to Outside
Images of Brain Development in Healthy Youth (Ages 5 – 20)

Earlier: Limbic
Motor Coordination
Emotion
Motivation

Later: Prefrontal
Judgment

Blue represents maturing of brain areas

Recipe for Risk Taking

Recent Resource on Teen Brain Development

http://mentor-adepis.org/brain-construction-window-developing-brain/

Point #2: Marijuana, adolescence, and driving are a bad mix
2a. Adverse Health Effects of Marijuana Use
Volkow, Baler, Compton, & Weiss, *NEJM*, 2014

### Table 2. Level of Confidence in the Evidence for Adverse Effects of Marijuana on Health and Well-Being.

<table>
<thead>
<tr>
<th>Effect</th>
<th>Overall Level of Confidence²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addiction to marijuana and other substances</td>
<td>High</td>
</tr>
<tr>
<td>Abnormal brain development</td>
<td>Medium</td>
</tr>
<tr>
<td>Progression to use of other drugs</td>
<td>Medium</td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>Medium</td>
</tr>
<tr>
<td>Depression or anxiety</td>
<td>Medium</td>
</tr>
<tr>
<td>Diminished lifetime achievement</td>
<td>High</td>
</tr>
<tr>
<td><strong>Motor vehicle accidents</strong></td>
<td><strong>High</strong></td>
</tr>
<tr>
<td>Symptoms of chronic bronchitis</td>
<td>High</td>
</tr>
<tr>
<td>Lung cancer</td>
<td>Low</td>
</tr>
</tbody>
</table>

Editors: Sabet & Winters
Publisher: Oxford University Press

<table>
<thead>
<tr>
<th>Health Topic</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain structure/functioning</td>
<td>converging cross-sectional data suggestive that MJ affects multiple cognitive systems; longitudinal data inconclusive</td>
</tr>
<tr>
<td>Mental health</td>
<td>strong link for psychosis, less so for other disorders; candidate gene and early-onset use a contributor</td>
</tr>
<tr>
<td>Lung functioning</td>
<td>regular marijuana smoking is associated with symptoms of acute and chronic bronchitis; literature weakened by too few studies and confound of tobacco use often not controlled</td>
</tr>
<tr>
<td>Effects on driving</td>
<td>consistent relationship between the blood concentration of THC and driving impairment; early signs of impact on highway safety in CO and WA</td>
</tr>
</tbody>
</table>
Strongest evidence that cannabis MJ is associated with...

- effectiveness for numerous medical conditions (e.g., chronic pain)
- increased risk for lung cancer
- lower birth weight of the offspring (maternal cannabis smoking)
- cognitive impairments (acute effects)
- development of schizophrenia or other psychoses; highest risk among heavy users
- development of problem cannabis use when early onset of use
- increased risk of motor vehicle crashes

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**THC Involvement in Fatally Injured Drivers by Year and Age Group, 1999-2010**

Point #3: Change the Context, Change Risk Behaviors

Risk-Taking

- Based on science of brain development, a modern view of risk taking in adolescence is...
  - evolutionarily adaptive
  - normative; important to development
  - significant individual differences
  - is due primarily to emotional and contextual, not cognitive, factors
Impact of Peer Presence on Risky Driving in Simulated Context

Many Teenage Health Behaviors are Improving in Recent Years

- Decrease in.....
  - fatal automobile accidents
  - teen pregnancy rate
  - tobacco use
  - alcohol use

- Increase in ..... 
  - drug free youth

Gray Matter Maturation (Gogtay et al., 2004)
Abstaining from Illicit Drugs, Alcohol and Cigarettes - Lifetime

Point #4: Review

- Adolescence is an extended period of transition from reliance on adults to independence
- Normal adolescence is characterized by:
  - increase in conflicts with family members
  - desire to be with one’s friends
  - resistance to messages from authority
  - emotionality
  - decision making driven more by perceived rewards rather than consequences
  - risk taking
Review

- Rays of hope: adolescent risk taking can be mediated by context, which includes prevention efforts, public health polices, and community initiatives.

THANK YOU!

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