Alcohol and the Adolescent Brain

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“Freedom is that instant between when someone tells you to do something and when you decide how to respond”

Unknown
Your Brain – “Use it or Lose it”

“Kids who “exercise” their brains by learning to order thoughts, understand abstract concepts, and control their impulses are laying the neural foundations that will serve them for the rest of their lives.”

Dr. Jay Giedd, National Institute of Mental Health
Brain Regions and functions

- **Amygdala** – Its function; arousal; controls automatic response related; emotional responses; hormonal secretions
- **Corpus callosum** – connects the left and right cerebral hemispheres. It is a wide, flat bundle of axons beneath the cortex; most communication between the two halves of the brain are conducted across the corpus callosum. Responsible for intelligence, consciousness and self awareness: reaches full maturity in 20’s
- **Nucleus accumbens** - is responsible for how much effort the organism will expend in order to seek rewards. A developing nucleus accumbens is believed to contribute to the often observed tendency that adolescents prefer activities that requires low effort yet produce high excitement.
- **Parietal lobes** - integrate auditory, visual, tactile signals: immature until age 16
- **Temporal lobes** - emotional maturity: still developing after age 16
- **Prefrontal Cortex** - judgment; self-assessment; decision making; controlling impulses
Normal Brain Development

Complex Executive Functioning of the prefrontal cortex develops gradually during childhood and adolescence, perhaps into adulthood.

**in other words**

The teenage brain is not a finished product but a work in progress!

- The front of your brain is responsible for
  - Reasoning
  - Motivation
  - Judgment
What scientists say....

As the teenage brain is configured, it is more exposed, more easily wounded, more susceptible to critical and long lasting damage
Science says....

Findings show that the greatest changes to the parts of the brain that are responsible for functions such as self-control, judgment, emotions and organization occur between puberty and adulthood.
So what changes during adolescence?

• Risk Perception Decreases

• Reward Sensitivity

• Self Regulation
Reward Sensitivity

Adolescents seek higher levels of stimulation and novelty to achieve the same feeling of pleasure.
Self regulation

- Getting off a “runaway train” or interrupting risky behavior (going to a party at someone’s house you do not know)

- Not jumping the gun or thinking before acting (diving into a lake of unknown depth)

- Doing the right thing (Choosing an alternative of varying risk) Turning down a ride from a driver who has been drinking
These SPECT images show functional activity levels in the brain of a healthy nondrinker (left), and that of a sober 21-year-old with a four-year history of heavy alcohol use (right). The "holes" indicate areas of reduced brain activity.
Some research...

- Brain scan of teenagers who drink versus teens who don’t on the average showed the hippocampus of a young drinker is 10% smaller than that of a non-drinker.
So why do adolescents drink?
What is a drink?

12 oz. = 1 ½ oz. = 5 oz. = 12 oz.
Blood Alcohol Content or BAC

1 standard drink = .02 BAC

It takes 1 hour to process one standard drink
## Typical Behaviors which occur for a moderate drinker at various BAC

<table>
<thead>
<tr>
<th>BAC</th>
<th>Description</th>
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<tbody>
<tr>
<td>.01 - .05%</td>
<td>Lowered alertness, “good” feeling, less inhibited behavior, thought and judgment impaired</td>
</tr>
<tr>
<td>.06-.10%</td>
<td>Slowed reaction time, distorted depth perception, peripheral vision glare recovery, behavior changes diminished awareness <em>legally drunk (.10%)</em></td>
</tr>
<tr>
<td>.13 -.20%</td>
<td>Marked depression in motor capability, emotional outbursts joy, anger, weeping, shouting) decidedly intoxicated</td>
</tr>
<tr>
<td>.21 -.25%</td>
<td>Severe motor disturbances, staggering, sensory perceptions greatly impaired, blurred vision,</td>
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BAC continued....

.30%   Semi-Stupor

.35%   Surgical Anesthesia, minimal level to cause death in some people

.40%   Comatose

.50%   Cessation of breathing and heart beat
What is considered Binge Drinking?

Male = 5 or more drinks in a row

Female = 4 or more drinks in a row
Binge Drinking Facts

• Binge drinking during high school, especially among males*, is strongly predictive of binge drinking in college.

• In schools with high binge drinking rates, 34% of non-binge drinkers reported being insulted or humiliated by binge drinkers, 13% reported being pushed, hit or assaulted, 54% reported having to take care of a drunken student, 68% were interrupted while studying, and 26% of women experienced an unwanted sexual advance.

• Binge drinkers are 14 times more likely to drink and drive.

• 50% of the 100,000 alcohol related deaths in the United States each year are due to binge drinking.
Alcohol Poisoning

Alcohol Poisoning a severe and potentially fatal physical reaction to an overdose of alcohol.

Symptoms of Alcohol Poisoning

• Vomiting
• Unconsciousness
• Cold, clammy, pale, bluish skin
• Slow or irregular breathing (less than 8 breaths a minute or 10 or seconds between breaths
Appropriate Action

• Call 911 Immediately

• While waiting for 911, gently turn the intoxicated person on his/her side and maintain that position by placing a pillow in the small of the person’s back.

• It is important to prevent aspiration (choking) should the person vomit.

• Never leave the person unattended.

• Though the person may seem like they are sleeping it off, but they may still be processing alcohol through their bloodstream. The blood alcohol levels could continue to rise. This is a very critical problem.
• A drunk person should not be in charge of a drunk person

• Do not try to exercise the person

• Do not let the person drive a car, or other vehicle, or ride a bike etc.

• Do not give the person food, liquid, mediation or drugs to sober them up

• Do not give the person a cold shower, the shock could cause unconsciousness

• The only thing that sobers a person up is TIME!!!
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What are your questions?