

The Amazing Adolescent Brain: Opportunities and Vulnerabilities

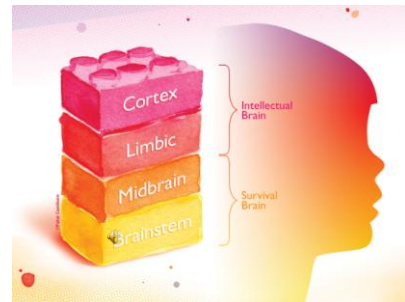
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WHAT WE'RE TALKING ABOUT

- 1) How the teen brain is changing
- 2) Emotions and communication
- 3) Developing brains, booze, and drugs
- 4) Evidence-based strategies for teens, parents, and schools

- 3 POUNDS OF PUDDING
- 100 BILLION NEURONS
- 100 TRILLION CONNECTIONS

BUILDING BLOCKS OF YOUR BRAIN



Peter Camburn

UPGRADING THE HARD DRIVE

1. GRAY MATTER THICKENS
2. BUILDING CONNECTIONS → → → →
3. MYELINATION=INSULATION & SPEED

INFORMATION SUPER HIGHWAY

268 MPH

USE IT OR LOSE IT!

MISSION CONTROL

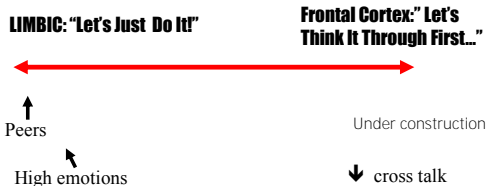


Frontal Cortex

- Impulse control
- Good judgment
- Problem solving
- Processing emotions & self-control
- Language
- Organization & planning
- Motivation
- Setting goals

STORY OF PHINEAS GAGE

Risk-Taking and the Developing Adolescent Brain: A MENTAL & CHEMICAL TUG-OF-WAR



SEROTONIN & DOPAMINE LEVELS ARE FLUCTUATING

Neurochemical Drive Toward Thrill Seeking

- Excessive risk-taking ↑s dopamine levels
- Feel-good effect of dopamine is more related to taking risk than the outcome
- High levels of stress ↓s dopamine levels

Key Points

- Good decision-making come from experience
- The teen brain has to work harder until it gets all of its connections
- The teen brain gets **stressed out** more easily
- "Multi-tasking" is a myth...

Corpus Callosum

- Connects right and left hemispheres
- Creativity and higher thinking
- Continues to grow into 20's



The Teen Brain Needs Opportunities for:

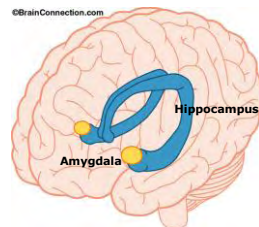
1. Lots of hands-on, skill-based learning
2. Discovering new interests and talents
3. Practicing personal control and decision making
4. Novel experiences and making low-risk mistakes

Limbic System: Emotion Core of the Brain

WHAT'S YOUR NAME AGAIN?
---that's your **HIPPOCAMPUS** working

SOMEBODY JUMPS OUT IN THE DARK...
---your **AMYGDALA** is on RED ALERT

STOMACH GRUMBLING FOR LUNCH...
---your **HYPOTHALAMUS** is telling you to eat



Implications for Learning

- Encoding facilitated by moderate stress
 - Cortisol acts like “Super Glue”
- Retrieval/recall optimal with minimal stress
 - Cortisol interferes with recall, esp. details
- High stakes testing can release too much cortisol and limit recall
- Which teaching strategy produces the least amount of cortisol and learning?

J. Medina, 2008

Expressing Anger Constructively

- Tell the person how you feel: “I’m...”
- Identify the specific event that led to how you are feeling: “I’m feeling __ because...”
- Explain what the event produced that feeling (how it effected you): “The reason I feel __ is that....”
- Explore what the options are to address the problem and make a plan: “What can we do to solve this...?”

Guiding Good Choices

Emotional Health

- Half of lifetime mental health disorders start by age 14
- 30% of teen report depressive symptoms at any given time
- Depression is linked to adolescent risk behaviors

Kessler et al, 2005; Rushton et al, 2002; Brown et al, 1996; Lehrer et al, 2006; YRBS

Communication Tools

1. Use “I” statements to talk about feelings/impact of behaviors
2. Use open-ended questions to ask a teen what he/she feeling
3. Clearly acknowledge/validate their feelings without judgment
4. Listen, listen, listen...

What We Can Do

- Provide predictability through routines, rituals, reviews
- Help teens to find positive outlets for their feelings & frustrations
- Role model good stress management & problem-solving skills

Jensen, 2000

PROTECTING A DEVELOPING BRAIN

- Alcohol & drugs
- Nicotine
- Digital Abuse

THE TEEN BRAIN IS AFFECTED DIFFERENTLY BY ALCOHOL

- More likely to black-out
- ↓ sensitivity to the sedative effects
- ↓ sensitivity to the effects of alcohol on motor coordination
- Hippocampus is 10% smaller in heavy teen drinkers



Brown et al, 2000; Brown et al, 2001;
Wuethrich B, 2001; Swartzwelder et al, 1995

PROACTIVE STRATEGIES

Talk honestly and routinely with teens

Recognize risk of trauma & self-medication

Advocate for EB-prevention

Start earlier!

more...

Take-Home Messages

1. How teens spend their time will shape their brains.
2. The role of parents is as important during adolescence as it is in the first years of life
3. Teens need opportunities for positive risk-taking with adult guidance.
4. Successful prevention and youth engagement relies on collaborative leadership and teamwork.