The Middle School Brain & Importance of Sleep on Learning

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Mind of a Middle Schooler

Attention Spans of **10-12 minutes**

Misinterpret emotions & instructions up to **40% of the time**!

Retain only **5-7 bits of information** at one time.

Learn best through interaction & activity

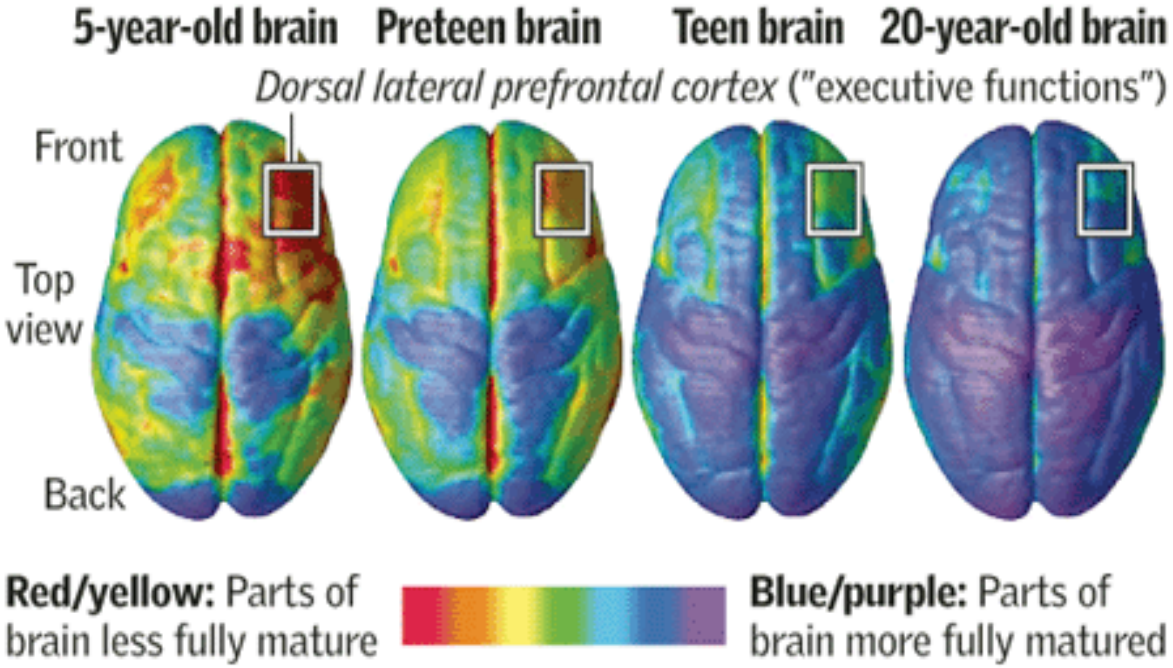
The brain growth that occurs between the ages of 10-15 is the second greatest in human life!

Adolescents need **9-13 hours** of sleep per night to function best

- 6-12 years = 9-12
- 13-18 years = 8-10

Middle School: Growth & Changes

Adolescence: *a time of very fast physical, intellectual, and emotional growth.*



BRAIN CHANGES:

- A "remodeling" of the brain occurs, where connections are made stronger.
- The development of the Prefrontal Cortex is last, which is responsible for:
  - Planning
  - Thinking of consequences of actions
  - Controlling Impulses
  - Solving Problems
- Adolescents rely on the Amygdala, responsible for:
  - Emotions
  - Impulses
  - Aggression
  - Instinctive behavior

BIOLOGICAL SLEEP CHANGES:

- Adolescents' internal clocks are pushed back by around **2-hours**
- As a result, average nightly sleep **decreases by 40-50 minutes**

RESEARCH FINDINGS

57.8% of middle schoolers did not get enough sleep on school nights.

Research has shown that kids **without** ADHD will show ADHD symptoms with a sleep deficit (even **1-hour less of sleep** a night for 6 days in a row)

68% of teens reported having their devices within reach at night.

A 2014 study found that **80% of teens** admitted to using their phones when they were supposed to be sleeping (or their parents thought they were sleeping).

57% of teens who use technology in bed suffer from sleep problems.

Children with grades C and below averaged **25-30 minutes less sleep per weeknight** than classmates who achieved A's and B's.

2014 Sleep in America Poll:

- Over 90% of parents reported sleep to be either very important or extremely important to their own and their child's emotional and physical well-being.
- However, **more than half** of these older adolescents were found to sleep 7 or fewer hours per night.

Impacts of Insufficient Sleep

IMPACT ON LEARNING

- Impaired Memory / Learning new information
- Inattention / Alertness / "zoning ou
- Distractibility
- Impulsivity / Careless Errors
- Worsened Sequential Thinking
- Problem Solving / Decision Making
- Poorer Judgement
- Reduced ability to perform math calculations
- Following Directions
- Difficulty with verbal creativity
- Work more slowly
- Lower IQ scores

*Research has shown that insufficient sleep can lower learning abilities by **as much as 40%!**

IMPACT ON OVERALL WELL-BEING

- Depression
- Anxiety
- Risk Taking Behavior
- Aggression / Irritability
- Weakened Immune System
- Hunger / Weight – hormones are impacted by sleep
- Peer Conflicts

Inadequate sleep has long-term effects on academic performance and mental health. Impacts well-being, decision-making, and attention—all of which are essential to success in school.

The Brain Explains Why

- Activity occurs in the hippocampus when we learn new information. When we sleep, the brain then replays the same activity pattern to help the information stick. Sleeping after learning consolidates information into memories, allowing them to be stored in the brain (and retrieved later).

- The process of preserving key memories and discarding excessive information takes place during both the non-rapid eye movement (NREM) and rapid eye movement (REM) stages of sleep cycle.

- Emotional memories are also processed in REM, which can help cope with difficult experiences.

- Sleep deprivation cuts the connection between brain regions (Amygdala & Prefrontal Cortex)

- Sleep boosts creativity and the ability to find new solutions to problems (“sleep on it”)

- The parts of the brain that help weigh negative outcomes are less active, while those that process positive outcomes are more active. This results in less ability to make sound decisions and successfully access risk when we lack sleep.

Electronic Devices & Sleep

Sleep-Wake Cycle: The Physiological Response to Blue Light

- The blue light emitted by electronic devices simulates daylight, which **inhibits the brain's production of melatonin.**
- Children & adolescents may be extra sensitive to blue light because their eyes let more light in than adults.
- **"Passive Technology"** still disrupts the sleep cycle (TV on in background, notifications, etc.). Text alerts, game notifications, emails, etc. all can interrupt deep sleep.
- One study showed that **36% of teens** looked at their phones in the middle of the night to check something other than the time at least 1x a night.

Correlations: Depression rates in teens increased sharply in 2012—exactly when smartphones became more common when sleep deprivation began to increase in teens as well.

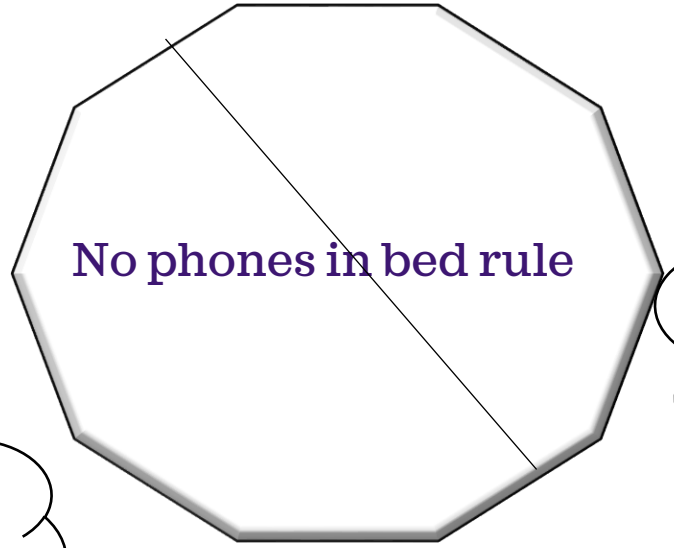
So...What Can Families Do?

Limit smartphone use 30-minutes to 1-hour before bed.

Aim for the recommended 9-13 hours of sleep per night.

Consistent schedule on weekdays and weekends.

Discussions about sleep, commitments, and time management.



Consistent pre-bed routine to help with relaxation & falling asleep.

Monitor your child's sleep.

Parent involvement in children's sleep schedules are critical for establishing healthy sleep habits.
Take an active role!

Parent Resources

Books:

Owens, J.A., & Mindell, J.A. (2005). *Take Charge of Your Child's Sleep: The All-in-one Resource for Solving Sleep Problems in Kids and Teens.* Cambridge, MA: Da Capo Press.

Whiteley, C., & Emsellem, H.A. (2006). *Snooze…or Lose!: 10 "No-War" Ways to Improve Your Teen's Sleep Habits*. Washington, DC: National Academies Press.

Websites

www.healthychildren.org/English/healthy-living/sleep/Pages/default.aspx

http://kidshealth.org/en/parents/sleep.html