

The Adolescent Brain

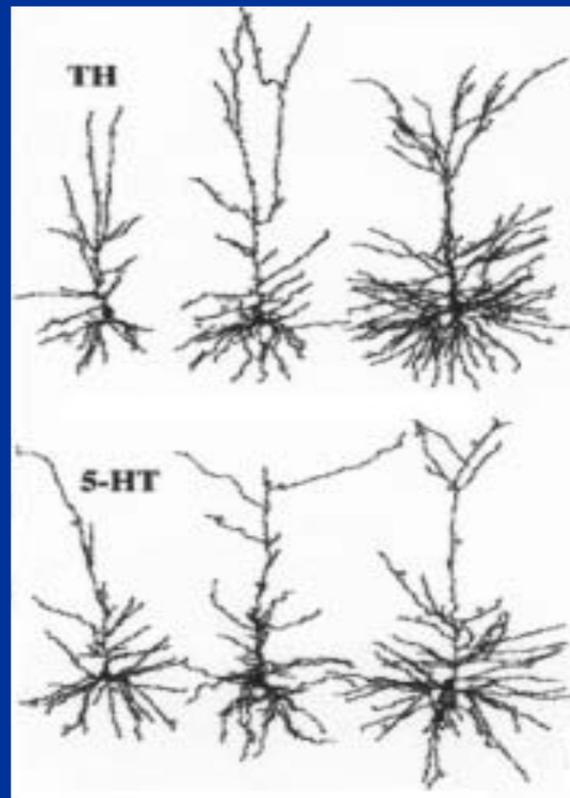
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MUS Parent Speaker Series

March 22, 2012

The Adolescent Brain

Adolescence is the second largest period of neurological change in the human life.



Neurological Changes During Adolescence

- Neurochemical Changes

1. Dopamine
2. Serotonin

- Neurostructural Changes

1. Arborization
2. Amygdala
3. Prefrontal Cortex

Neurochemical Changes

■ Dopamine

- plays a crucial role in the regulation of reward and movement
- levels are highest during adolescence
- results in excessive energy and activity

Neurochemical Changes

■ Serotonin

- plays a crucial role in the regulation of social and emotional regulation
- levels are lowest during adolescence
- results in negativity, pessimism, and depression

Neurostructural Changes

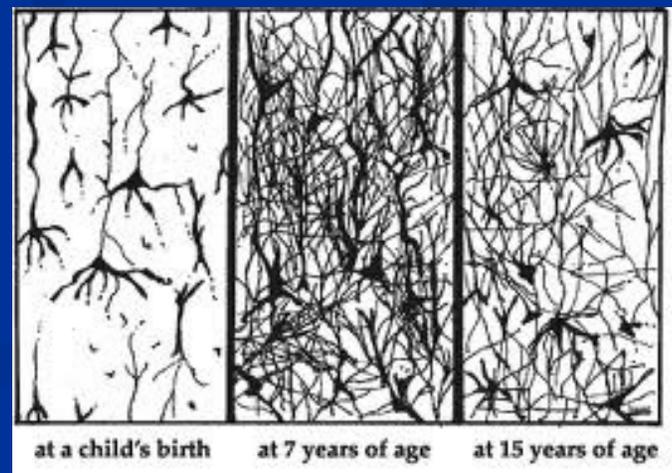
■ Arborization

■ blooming & pruning

- **blooming:** new neural connections are formed

- **pruning:** infrequently used connections wither and die

- results in information connection that does not make sense to others.



Neurostructural Changes

- amygdala
 - plays a primary role in the processing and memory of emotional reactions, especially related to fear, threat and danger
 - the most developed part of the adolescent brain
 - results in excessive suspiciousness, sensitivity and irritability.

Neurostructural Changes

- prefrontal cortex
 - “executive functioning” center
 - planning
 - attention
 - problem-solving
 - inhibition of impulse
 - self-awareness
 - self-monitoring
 - initiation
 - mental flexibility
 - working memory
 - development is not complete until around age 25

The Adolescent Brain

- case study: Axl Heck (ABC's *The Middle*)



The Adolescent Brain

- What can we do?
 1. behavior modification
 2. surrogate frontal lobe
 3. patience
 4. persistence
 5. self-control

Behavior Modification

- pleasure increases the likelihood of repeating behavior
- discomfort decreases the likelihood of repeating behavior
- competing demands complicate the issue

Surrogate Frontal Lobe

- another word for executive functioning is self-talk
- modeling
- repetition
- classical conditioning

Patience, Persistence & Self-Control

