Brain Development in Children and Teens

Children's Brain Development

- How children's brains develop depends on how the genes they're born with interact with the experiences they have.

Brainstem

- The brainstem is fully developed at birth.

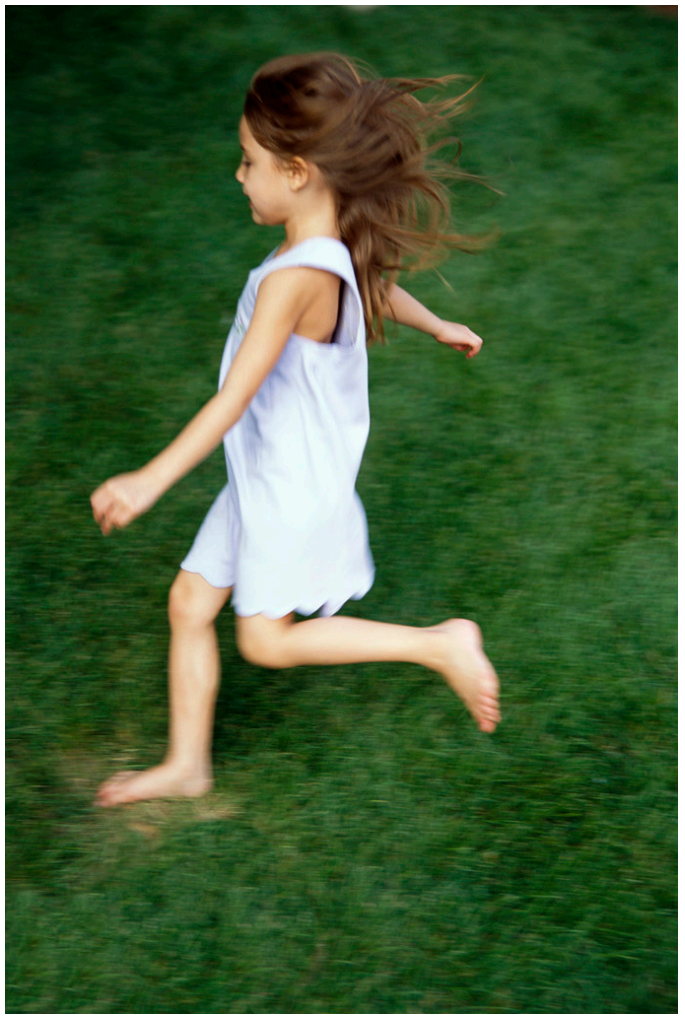
- It is responsible for survival functions such as:
  - Blood pressure.
  - Heart rate.
  - Body temperature.

Cerebellum

- The cerebellum controls a person's automatic movements and balance such as:
  - Dancing.
  - Kicking a football.
  - Bringing a cup to the lips to drink.

Midbrain

- The midbrain controls:
  - Sleep.
  - Arousal responses.
  - Appetite.
  - Motor movements such as running and skipping.



Limbic System

- The limbic system controls emotions and long-term memories.
- A part of the limbic system is involved in attaching emotions to memory.

Cortex

- The different regions of the cortex are responsible for processing:
  - Vision.
  - Touch.
  - Hearing.
  - Speech.
  - Language development.
  - Problem solving.

How Children's Brains Develop

- The more the brain is stimulated, the faster and stronger connections becomes.
- If the brain is not stimulated, the connections between cells dry up.

How Children's Brains Develop

- The more connections between the brain cells the better.
- These connections are forming the structures that will allow a child to learn.

How Children's Brains Develop

- The brain of the baby is still forming connections responsible for feeling, learning, and remembering.
- Most of the synapses that are crucial to learning form *after* birth.

How Children's Brains Develop

- It is through the development of synapses that the brain develops a functional architecture.
- Without this, there would be no habits, no thoughts, no consciousness, no memories, and no mind.

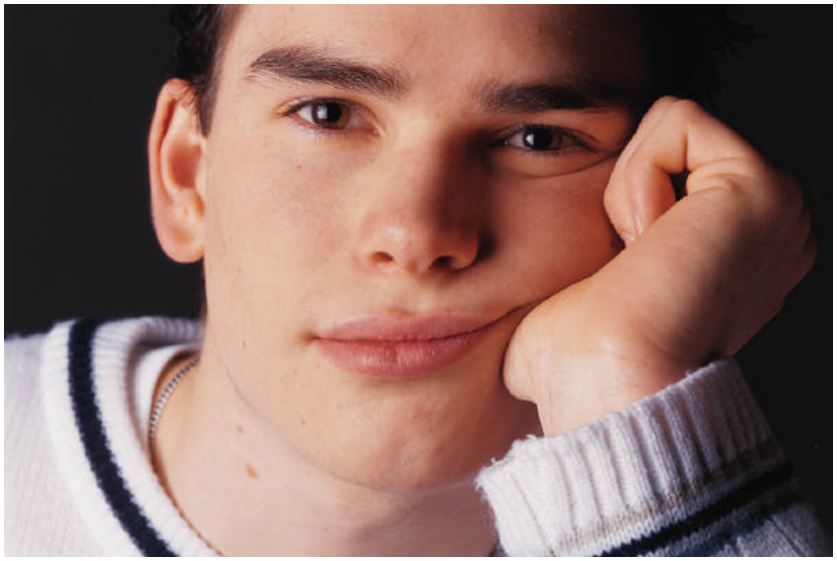
Effects of Violence and Stress on Kids' Brains

Abusive experiences can increase the risk of developing behaviors ranging from:

- Aggression.
- Failure.
- Language.
- Depression.
- Mental disorders.
- Diabetes.
- Asthma.
- Epilepsy.
- High blood pressure.
- Immune system dysfunction.

Effects of Violence and Stress on Kids' Brains

- Abusive experiences organize the millions of constantly active connections between brain cells into diseased networks.



Effects of Violence and Stress on Kids' Brains

- Bad experiences affect the brain primarily through stress hormones.
- When these hormones are overactive as a result of persistent stresses, the terrorized genes set up irregular networks of connections between brain cells.

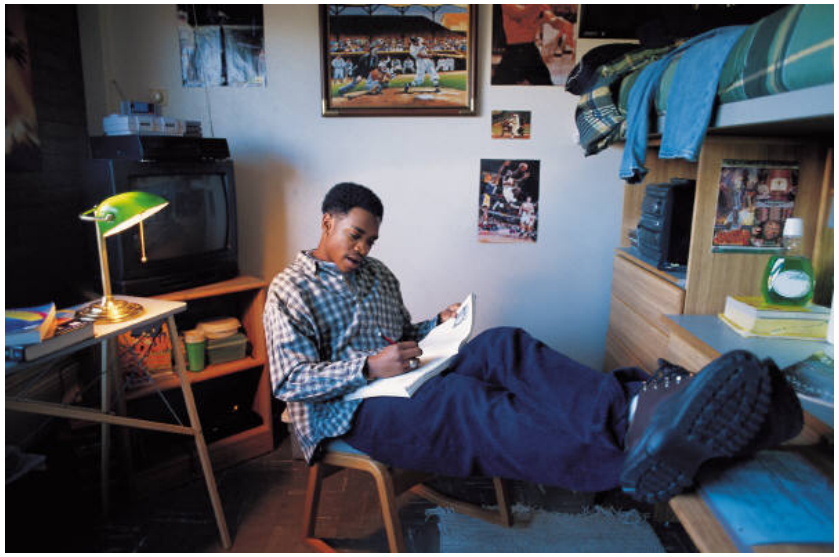
What Every Child Needs

To promote children's brain development, every child needs:

- Interaction.
- Touch.
- Stable relationships.
- Safe, healthy environments.
- Self-esteem.
- Quality care.
- Play.
- Communication.
- Music.
- Reading.

Teen's Brain Development

- From pre-adolescence through the early 20s, the brain is undergoing more changes than any other time except immediately after birth.



Teen's Brain Development

- The biggest changes in teen brains are occurring in the brain's prefrontal cortex, located right behind the forehead.
- The prefrontal cortex governs "executive" thinking (our ability to use logic, make good decisions and size up potential risks).

Teen's Brain Development

- The teen brain is feverishly reshaping itself by pruning neural connections at the rate of 30,000 per second.

Teen's Brain Development

- The pruning of these connections are very important in brain development as what teens do or not do can affect them for the rest of their lives.

Teen's Brain Development

- Changes to the logic center of the brain explains why teens sometimes make poor decisions.

Teen's Brain Development

- Taking risks and thrill seeking behaviors occur because the frontal lobes are not fully developed in teens.
- Higher levels of certain neurotransmitters make teens more impulsive and likely to participate in risky behaviors.

Teen's Brain Development

- Coupled with a diminished control of logic and a higher influence of impulses, teens can be at risk for serious injuries.

Teen's Brain Development

- In moments of high arousal, especially when around their friends, emotions often override logic.
- Examples include:
  - Shoplifting even though the teen has money.
  - Driving drunk despite knowing the negative consequences.

Teen Brain: Emotional Development

- Teen's brains are still developing when it comes to being able to think about other peoples feelings.
- Until the prefrontal cortex, the "executive functioning" develops, teens often have difficulty assessing and responding appropriately to the emotions of others.

Teen Brain: Emotional Development

- Teens read the facial expressions of others differently than adults do.
- Teens may not fully understand when a parent is looking angry or sad even though to the parent it may seem perfectly clear.
- This can lead to confusion and communication difficulties.

Teens and Sleep

- Scientists have found that teens are in a constant state of sleep deprivation.
- The average teen needs about 9½ hours of sleep a night but they only get about 7.
- The chemical that governs sleep doesn't kick in until around 10:30.

Teens and Sleep

- Lack of sleep contributes to:
  - Teens having difficulty with grades in school.
  - Road accidents.
- Some schools have even moved the start time for school later in the day.

Teens and Activities

- A lot of free time for teens is related to:
  - Early sexual activity.
  - Drug use.
  - Drinking.
  - Delinquency.
- Sports, clubs, volunteer efforts and after school jobs are good for teens, in moderation.

Teens and Activities

- Help your teen find a balance between school, activities, family time and personal time.

Teen's Brain Development

- While development during this time can be trying for both parents and teens, most teens make it into adulthood with only minor scratches.

Teen's Brain Development

- Help guide and support your teen.
- It will allow them to practice using good decision making skills and will help them become healthy, happy adults.