



Brain development is impacted by both our genetics and our experiences. As children grow, their brains develop basic functions first (breathing) before progressing to more sophisticated functions (complex thought).

HEALTHY BRAIN DEVELOPMENT

Early Brain Development

- Before and after birth neurons are created and form connections
- The brainstem and midbrain develop first, governing functions necessary for life like heart rate, breathing, eating, and sleeping



Young Child Brain Development

- Formation of synapses occurs at a high rate
- Higher function brain regions (governing emotion, language, and abstract thought) develop gradually and at different rates throughout childhood and adolescence/early adulthood
- By age 2, a child has formed 100 trillion synapses
- Synapses are eliminated as experiences deem them unnecessary (pruning)
- Protective layers form on cells to ensure clear and quick transmission of information across synapses (myelination)
- By age 3, a child's brain is 90 percent of its adult size



Adolescent Brain Development

- Prior to puberty there is a growth spurt in the areas of the brain governing planning, impulse control, and reasoning
- While these areas develop, teenagers can act impulsively, make poor decisions, and take increased risks, all normal behaviors for this stage
- More pruning and myelination occurs in the teenage years
- Growth and transformation of the limbic system

Neuron – the basic cell that allows communication between the brain and the body

Brain Stem – the part of the brain that regulates vital functions (heartbeat, etc.)

Mid Brain – the part of the brain that regulates vision, hearing, motor control, sleep, arousal, and temperature

Synapse – the connection between neurons that carry messages

Pruning – the shedding of unnecessary connections between neurons

Myelination – the strengthening of necessary connections between neurons

Limbic System – a network of brain structures that governs emotions and memory

OTHER FACTORS IMPACTING DEVELOPMENT



Responding to Stress

- The timing and type of stress determines the impact on the brain
 - Positive Stress** – moderate, brief, and generally normal part of life
 - Tolerable Stress** – more severe and long-lasting difficulties; can be damaging unless the stress is time-limited and buffered by relationships with adults that help the child adapt
 - Toxic Stress** – strong, frequent, and prolonged activation of body's stress response system that disrupts healthy development



Sensitive Periods

- Windows of time in development when certain parts of the brain may be more susceptible to certain experience (e.g., strong attachments to caregivers formed during infancy)



Memories

- Systems of neurons that have been repeated and strengthened



Trauma-induced changes to the brain can result in varying degrees of **cognitive impairment** and **emotional dysregulation** that can lead to a host of problems, including difficulty with attention and focus, learning disabilities, low self-esteem, impaired social skills, and sleep disturbances.



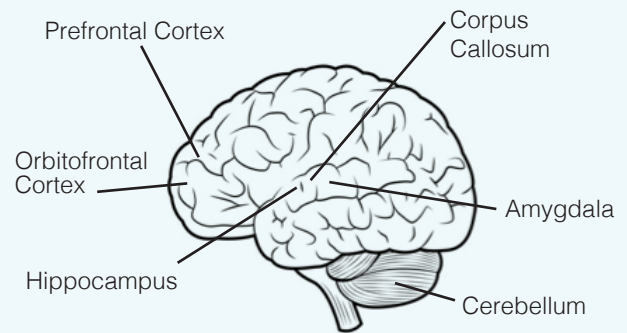
– Child Welfare Information Gateway, Supporting Brain Development in Traumatized Children and Youth

EFFECTS OF MALTREATMENT

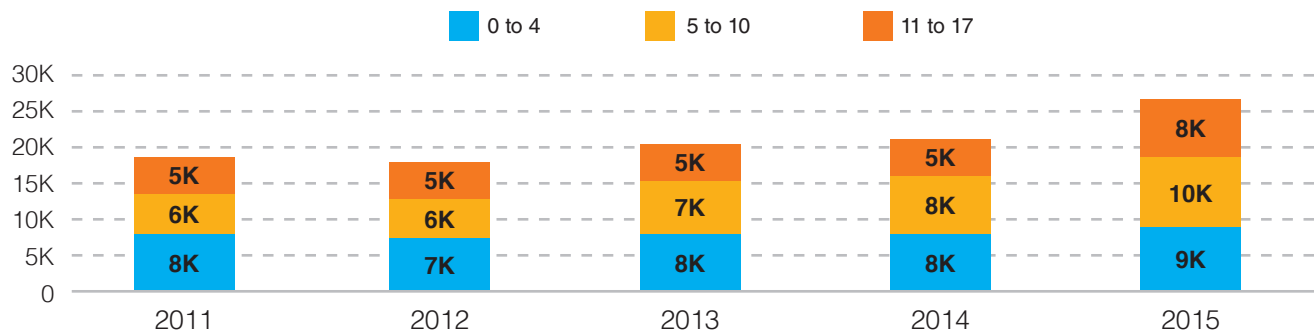
On Behavior, Social, and Emotional Functioning

- Permanent fear response to certain triggers, even when they pose no actual threat
- Fear response is automatically triggered without conscious thought
- Destabilization of emotion and stress regulation
- Diminished executive functions like memory, attention, impulse control, etc.
- Delayed developmental milestones
- Decreased response to positive feedback or rewards
- Social interactions made more difficult

Damage to the Brain



CONFIRMED CHILD VICTIMS OF MALTREATMENT IN GEORGIA, BY AGE



POLICY AND PRACTICE CONSIDERATIONS

Prevention and early intervention remain the most effective methods for minimizing the effect of maltreatment on development. Other promising trends include:



Trauma informed care and evidence-based practices



Family-centered practice and case planning, including parent-child interaction therapy



Individualized services for children and families



Child advocacy centers offering interviews, assessments, and services in a child-friendly environment