THE EFFECTS OF TRAUMA ON BRAIN DEVELOPMENT IN INFANCY

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• 40% of all children in the United States will experience trauma before 18
• 46 million children experience trauma on in a year.
• 686,000 children were victims of abuse and neglect
• 3.8 million children received preventive services by CPS
• Over 1,600 children died in 2012 as a result of maltreatment
NEURODEVELOPMENT

- Continuous process that is ongoing
- 100 billion neurons
- Ten times as many glial cells
  - Linked together by synapses
EIGHT MAJOR PROCESSES OF NEURODEVELOPMENT

- Neurogenesis: birth of neurons
- Migration: movement of neurons into final resting place
- Differentiation of neurons: specialization take place
- Apoptosis: dying off of neurons
- Arborization: formation of dendrites
- Synaptogenesis: creation of synapses
- Synaptic sculpting: building blocks of memory
- Myelination: faster communication
FOUR MAIN AREAS OF THE BRAIN

- Four main areas of the brain
  - Brainstem
  - Midbrain
  - Limbic system
  - Cortex

- Tiered fashion
  - Bottom to top
  - Inside to out
CORE FACTORS OF NEURODEVELOPMENT

- Genetic and environmental influences
- Sequential development
- Activity dependent
- Windows of opportunity and windows of vulnerability
WHAT IS TRAUMA?

• Trauma is defined as experiences that cause severe mental or emotional stress; an overwhelming threat

• Types of trauma
  • Natural disasters
  • War
  • Accidents
  • Abuse
  • Neglect
  • Domestic violence
  • Death of loved ones
  • Bullying
  • Illnesses
WHAT HAPPENS WHEN TRAUMA IS EXPERIENCED?

• Affects a key set of neural system
• Affects learning
• Affects behavior
• Affects body
• Affect brain development
• Affects attachment
• Affects social emotion
• Affects automatic nervous system
WAR AND MILITARY TRAUMA

• Issues
  • Separation
  • Deployment
  • Death

• Statistics
  • 2 million killed
  • 6 million injured
  • 1 million orphaned
  • 25 million were uprooted

• Characteristics
  • Anxious
  • Highly alert
  • Sleep deprivation

• Effects
  • Regression of social, emotional, and daily living domains
  • Stimuli may frighten them

• Signs of Distress
  • Fear/anxiety
  • Confusion
  • Regression
  • Loss of appetite
  • Mood swings
MALTREATMENT
TRAUMA

- General Statistics (Department of Human Services, 2012)
  - 685,000 children are victims of maltreatment
    - 86,000 were infants
    - 1,640 were fatal
    - 44% of deaths were infant

- Types of Maltreatment
  - medical neglect
  - Neglect
  - psychological abuse
  - sexual abuse
  - physical abuse
  - Other
SHAKING BABY SYNDROME

• 1,400 infants are shaken years
• 1 in 4 will die as a result of injures
• Effects of SBS
  • Swelling & Bleeding on the brain
  • Retinal tearing
  • Skull Fractures

• Lasting effects
  • permanent brain issues
  • Paralysis
  • Blindness
  • seizures,
  • cerebral palsy
  • delays in development
  • cognitive difficulties,
  • behavior issues
DOMESTIC VIOLENCE & SUBSTANCE ABUSE

Domestic Violence
• Higher Risk of Maltreatment
• Domestic Violence Exposure
  • First 6 months- indication of neglect
  • Parents Availability affects attachment.
  • Linked to aggression and violence later in life

Substance Abuse
• Higher Risk of Maltreatment
• Exposure to Substance abuse
  • FAS
    • Lower IQ scores
    • Severe issues with neurodevelopment
INSTITUTIONALIZED CHILDREN

- Smaller brain size
- Reduced IQ scores
- Social-Emotional Delays

**FIGURE 4.8**
EARLY DEPRIVATION AND BRAIN ACTIVITY.
These two photographs are PET (positron emission tomography) scans, which use radioactive tracers to image and analyze blood flow and metabolic activity in the body's organs. These scans show the brains of (a) a normal child and (b) an institutionalized Romanian orphan who experienced substantial deprivation since birth. In PET scans, the highest to lowest brain activity is reflected in the colors of red, yellow, green, blue, and black, respectively. As can be seen, red and yellow show up to a much greater degree in the PET scan of the normal child than the deprived Romanian orphan.
COMPLEX TRAUMA

• Multiple traumatic experiences with different types of trauma
  • Exposed to domestic violence → experiences child neglect due to parent unemotionally available → parents abuse alcohol → experiences child abuse from perpetrator of domestic violence → mother is murdered at hands of father and child witnesses it → child goes to live with grandparents → grandparents have a hard time handling child due to tantrums and nightmares → child goes into foster care......

• On average a child at the WMU Child Trauma Center who is being assessed has experienced 7 types of trauma before they are seen for treatment
COMPLEX TRAUMA

- Cumulative
- Over a period of time
- Within specific relationships
- Exposure to chronic trauma
- Multiple interpersonal traumatic events
EFFECTS OF COMPLEX TRAUMA

- Affects attachment
- Affects relationships
- Affects regulation
- Affects social behaviors
- Affects brain development
- Affects senses
- Affects the ability to learn
- Affect brain size
• Being trauma informed is crucial to the success of being able to help children/families who have experienced trauma

• Three Pillars of trauma informed care
  • Connections
  • Emotion and Impulse Control
    • Adults co-regulate
    • Active Listening
    • Reflective skills
  • Development of Safety
    • Physical and emotions
Attachment

- All trauma experiences impact attachment
- Attachment is vital to the success of children in life
  - Trust
  - Interaction
  - Regulate emotions
- Disorganized attachment

Risks of Attachment Issues
- Physical ailments
- More prone to stress
- Feelings associated
  - Unloved
  - Abandonment
  - Failure
<table>
<thead>
<tr>
<th>Domains of Complex Trauma</th>
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| **Attachment** | • Inability to form connections due to lack of caregiver support  
• Unable to see when a relationship is safe |
| **Biology** | • Muscle Tone  
• Balance  
• Sensory issues |
| **Affect Regulation** | • Labeling feelings  
• Self-regulation  
• Internalize stress |
| **Dissociation** | • Memory loss  
• Altered states of consciousness  
• Depersonalization |
| **Behavior Control** | • Under controlled  
• Impulsivity  
• Aggression  
• Understanding and Complying with rules  
• Over controlled  
• Comply easily  
• Self-soothing behaviors |
| **Cognition** | • Ability to pay attention  
• Learning difficulties  
• Process information |
| **Self-Concept** | • Sense of Self  
• Self worth  
• Negative body image |
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UNCERTAINTY

There is much uncertainty for every one involved when trauma is experienced

- For those working with the children
  - Age of children
  - Living situation
  - Other agencies involved
  - Behaviors of children

- For children
  - Type of trauma was experienced and how often.
  - What stage of development was the child in when the trauma occurred
  - Family dynamics
SUPPORTING FAMILIES

• Meet families where they are
• Watch stereotypes and biases
• How to help children
  • Relationships!!!
    • Peter
  • Therapy
  • Traumatic play (nonverbal play for infants)
• Education
“TRAUMA TRUMPS EVERYTHING”

The most damaging aspect of abuse is the trauma to our hearts and souls from being betrayed by the people that we love and trust.


Sandra Bloom

Depression Suicide
More Than Bruises Are Left Behind
Eating Disorders
Poor Health

Anxiety
Anger
Dissociation

Childhood trauma does not come in one single package.

Dr. Asa Don Brown
REFERENCES


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http://centerforchildwelfare.fmhi.usf.edu/kb/TraumaInformedCare/EarlyChildTrauma.pdf