

Childhood trauma

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I have no disclosures

Objectives

- Introduce Adverse Childhood Experiences
- Explain the impact of trauma on brain development
- Review current evidence about available treatments for childhood trauma

Child maltreatment

- Single biggest public health problem
- Predominantly perpetuated by a parent, family member, or other adult caregiver
- Most prevalent: psychological maltreatment
 - Emotional abuse: 36% of identified cases
 - Emotional neglect: 52% of identified cases

- More than **two thirds of children** reported at least 1 traumatic event by age 16. Potentially traumatic events include:
 - Psychological, physical, or sexual abuse
 - Community or school violence
 - Witnessing or experiencing domestic violence
 - National disasters or terrorism
 - Commercial sexual exploitation
 - Sudden or violent loss of a loved one
 - Refugee or war experiences
 - Military family-related stressors (e.g., deployment, parental loss or injury)
 - Physical or sexual assault
 - Neglect
 - Serious accidents or life-threatening illness

- The national average of child abuse and neglect victims in 2015 was 683,000, or 9.2 victims per 1,000 children.
- Each year, the number of youth requiring hospital treatment for physical assault-related injuries would fill **every seat in 9 stadiums**.
- 1 in 4 high school students was in at least 1 physical fight.
- 1 in 5 high school students was bullied at school; 1 in 6 experienced cyberbullying.
- 19% of injured and 12% of physically ill youth have post-traumatic stress disorder.
- More than half of U.S. families have been affected by some type of disaster (54%).

Adverse Childhood Experience (ACE) Questionnaire

Finding your ACE Score as of 10/24/06

While you were growing up, during your first 18 years of life:

1. Did a parent or other adult in the household **often** ...
Swear at you, insult you, put you down, or humiliate you?
or
Act in a way that made you afraid that you might be physically hurt?
Yes No If yes enter 1 _____
2. Did a parent or other adult in the household **often** ...
Push, grab, slap, or throw something at you?
or
Ever hit you so hard that you had marks or were injured?
Yes No If yes enter 1 _____
3. Did an adult or person at least 5 years older than you **ever**...
Touch or fondle you or have you touch their body in a sexual way?
or
Try to or actually have oral, anal, or vaginal sex with you?
Yes No If yes enter 1 _____
4. Did you **often** feel that ...
No one in your family loved you or thought you were important or special?
or
Your family didn't look out for each other, feel close to each other, or support each other?
Yes No If yes enter 1 _____
5. Did you **often** feel that ...
You didn't have enough to eat, had to wear dirty clothes, and had no one to protect you?
or
Your parents were too drunk or high to take care of you or take you to the doctor if you needed it?
Yes No If yes enter 1 _____
6. Were your parents **ever** separated or divorced?
Yes No If yes enter 1 _____
7. Was your mother or stepmother:
Often pushed, grabbed, slapped, or had something thrown at her?
or
Sometimes or often kicked, bitten, hit with a fist, or hit with something hard?
or
Ever repeatedly hit over at least a few minutes or threatened with a gun or knife?
Yes No If yes enter 1 _____
8. Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?
Yes No If yes enter 1 _____
9. Was a household member depressed or mentally ill or did a household member attempt suicide?
Yes No If yes enter 1 _____
10. Did a household member go to prison?
Yes No If yes enter 1 _____

Now add up your "Yes" answers: _____ This is your ACE Score

ACEs

- The effects of trauma are cumulative, individuals with multiple exposures likely carry a greater symptom burden.
- Population Attributable Risk: how much of a disease or behavior could be eliminated if we eliminate ACEs
 - Current depression: 54% (higher than removing family heredity)
 - Suicide attempts: 58%
 - Alcohol abuse: 65%
 - Drug abuse: 50%, IV drug abuse: 78%
 - Sexual assault: 62%, Domestic Violence: 52%, Promiscuity 48%

Long-term consequences

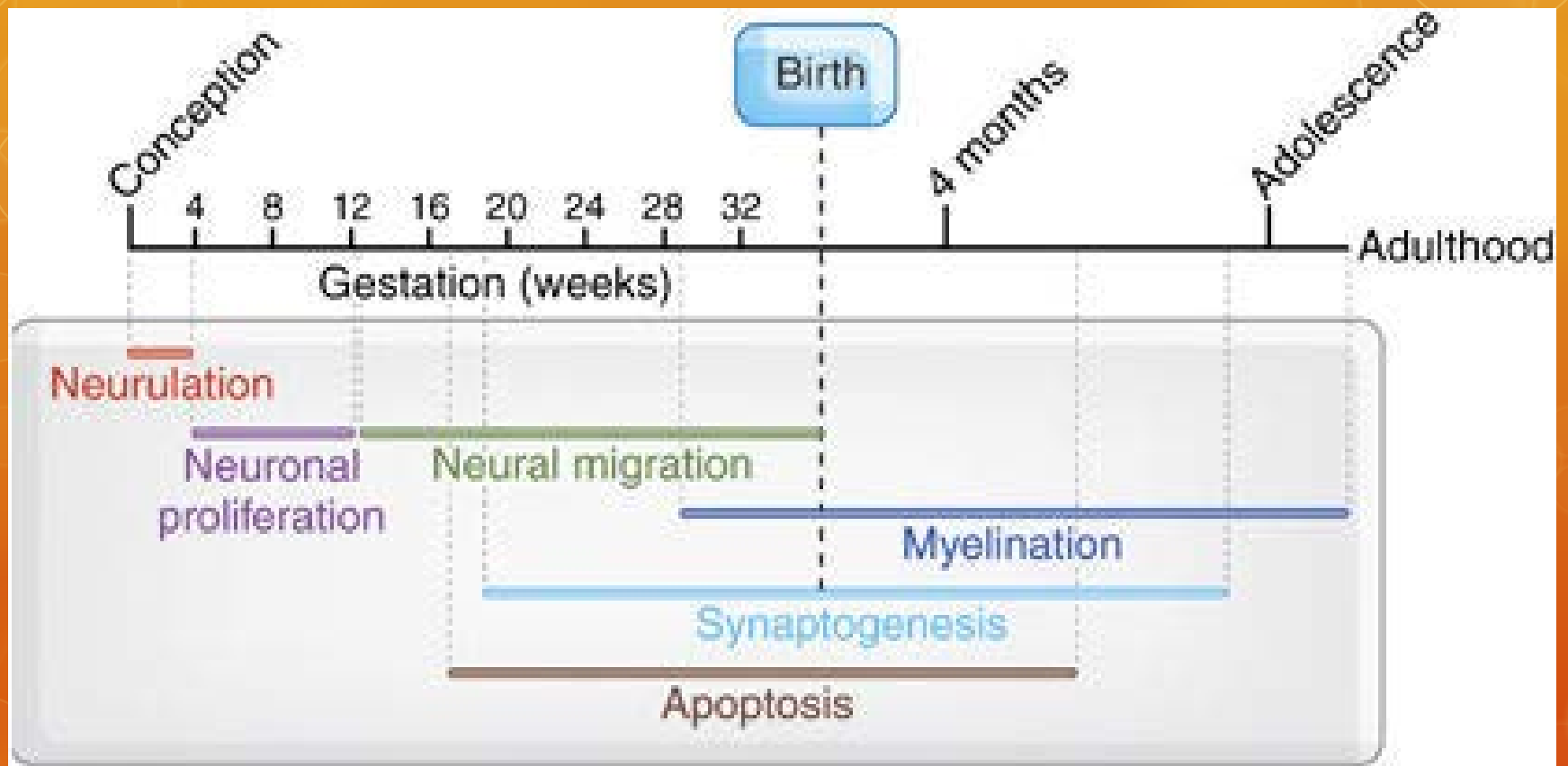
- Traumatic stress in childhood increases risk for attachment problems, eating disorder, depression, suicidal behavior, anxiety, alcoholism, violent behavior, mood disorders, and of course, PTSD.
- It also impacts other aspects of physical health throughout life such as GI and gynecological disorders, somatic problems such as chronic pain, headaches and fatigue. The risk of various medical conditions increases 4- to 12-fold with 4 or more ACEs.

Impact of child maltreatment

- Maltreatment in childhood increases risk for virtually every DSM disorder.
- How can abuse lead to psychopathology?
 - Neurodevelopmental perspective
 - Childhood trauma → alterations in systems in the brain which mediate the stress response
 - Neglect → dysfunction in neural systems which do not receive appropriately timed, patterned, repetitive stimulation.

Brain Development

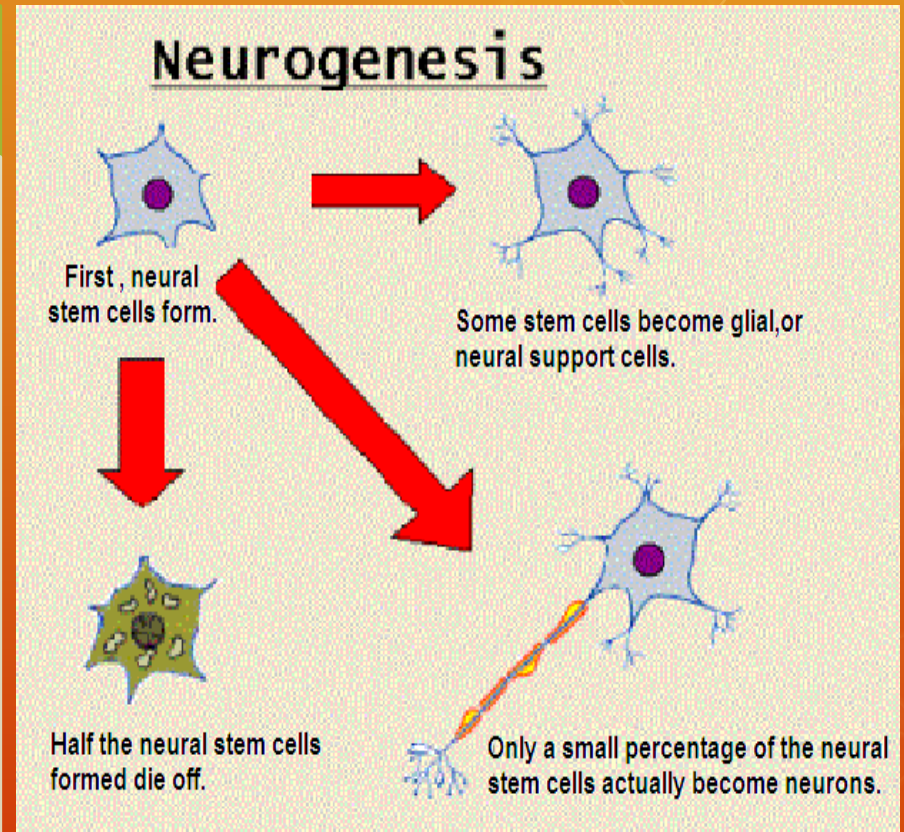
- Rapid in utero and in the first years of life.
- Disruptions in molecular processes taking place result in abnormal organization and function.
- The impact depends upon the nature, timing and frequency of maltreatment.
- Product of genetic potential and how that potential is expressed as function of timing, nature, and pattern of experience.



Brain Development

Neurogenesis

- Mostly in utero
- Alterations can have devastating impact on the fetal brain growth and result in profound psychopathology later in life



Brain Development

Migration

- Primarily during intrauterine and immediate perinatal period, continues throughout childhood
- Both genetic and environmental factors play important roles in determining a neuron's final location.

Differentiation

- Chemical, often neurochemical, signals
- Extreme activation of stress response during development

Synaptogenesis

- During the first 8 months of life there is an 8-fold increase in synaptic density
- Neurons find and connect with the appropriate target neurons
- Genetic factors, exposure to trophic factors, cellular adhesion molecules, neurotransmission

Brain Development

Apoptosis

- Absence of exposure to trophic factors; neurons that make synaptic connections with others and have an adequate level of stimulation will survive.
- Can be affected by understimulation from neglect

Synaptic Sculpting

- Continues through the adult life but the rate decreases with age
- Experiences, “use it or lose it”, key determinant is the activity of neurotransmission

Myelination

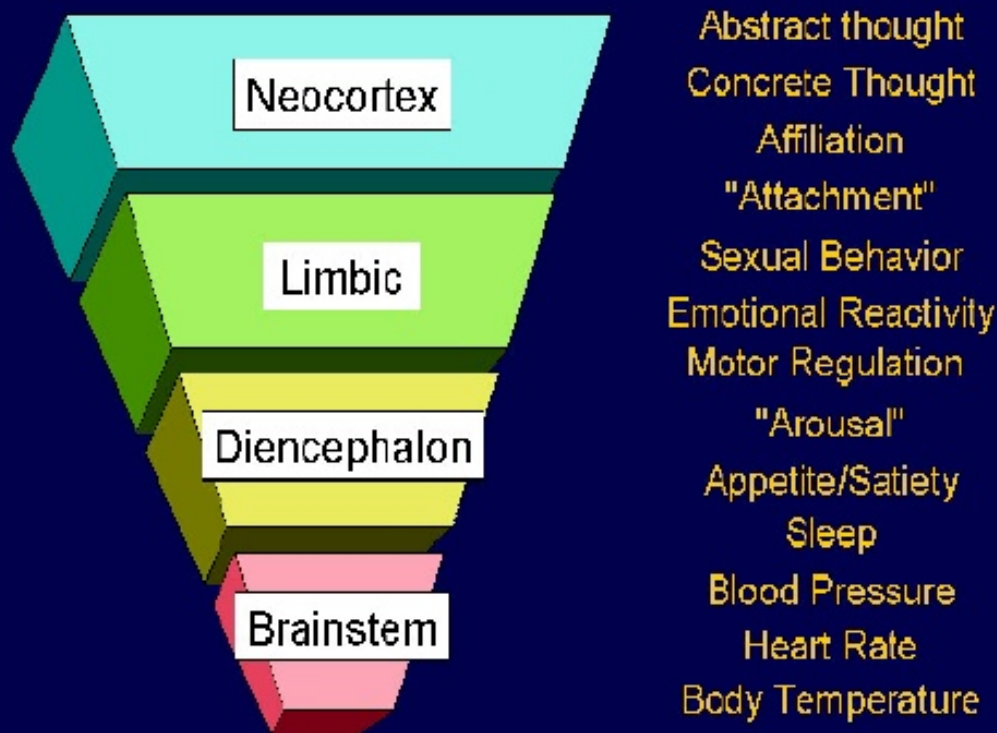
- Begins in the first year of life , continues throughout childhood and has a major burst in key cortical areas in adolescents.
- Allows for more complex functioning

Nature and nurture

- Chemical processes driving development in utero are genetically-determined sequences of molecular events.
- By birth, environmental cues mediated by the senses play a major role and even more so by adolescence.
- Interactions with caregivers are critical to brain development
 - Attachment: proximity seeking behavior toward a trusted other to increase felt sense of safety
 - Arousal regulation: begins as co-regulation with the primary attachment figures but also determined by sensory motor activity and executive functioning

Brain development is sequential and hierarchical.

Like most hierarchies, it is fairly rigid in function, and has a large 'executive function' department which is dependant on progressively smaller 'primitive function' departments!



Sequential neurodevelopment

- The brain is undeveloped at birth
- It organizes from the bottom up (brain stem to cortex) and from the inside out
- Experiences do not have equal impact throughout development (generally greater impact the earlier the age)

Sequential development

- By age 3, 80% of synaptic connections are already made
- By the second decade of life growth levels off and pruning begins
- The final organization and functioning of complex areas will be influenced by the pattern, intensity and nature of stimulation coming from lower noradrenergic, serotonergic and dopaminergic neurons.

Activity dependent

- Organization of the brain happens in a use-dependent fashion.
- Molecular cues that guide development are dependent upon the experiences of the developing child.
- The quantity, pattern of activity and nature of neurotrophic and neurochemical factors depends upon the presence and the nature of the total sensory experience of the child.
- Exposure to adverse experiences disrupts the neurodevelopment leading to a chaotic, developmentally-delayed, and dysfunctional organization.

Triggers for disruption

- Lack of sensory experience during sensitive periods.
- Atypical or abnormal patterns of necessary cues due to extreme of experience.
- Positive experiences later in life may not be sufficient to overcome the disorganization of the neural systems.
 - Supportive Relationships
 - Stimulating Experiences
 - Health-Promoting Environments

Human survival responses

- Freeze/scan → activation of the arousal system
- Fight or flight → hyperarousal
- Fright/submit → dissociation
- Adaptive neurobiological states can become maladaptive traits.
- The key issue for subsequent psychopathology is how long these systems are activated during the actual traumatic event.

Epigenetics and toxic stress

- Which genes are turned on/off, when, and where
- Ecology (environment/experience) influences how the genetic blueprint is read and utilized
- Ecological effects at the molecular level
- Stress-induced changes in epigenetic markers

Impact of child maltreatment

- Both neglect and trauma-related abnormalities in neurodevelopment would act as primary mediator of psychopathology by alteration of neural systems
- Trauma and neglect may play an exacerbating or expressing role for neuropsychiatric symptoms in individuals with genetic vulnerabilities
- Symptoms and problems caused by maltreatment can be disrupting factors for subsequent developmental opportunities.

Clinical expression

- Typical effects are delayed
- Younger children: separation anxiety, sexualized behaviors, behavioral problems, ADHD-like symptoms
- Adolescents: conduct problems, substance abuse, school problems, risky behaviors, self-harm, SI, depression, dissociation and somatic symptoms

Impact according to age

- Earlier in life we see more affect dysregulation, dissociation and somatization (<14 y/o)
- In children the full PTSD picture is not common
- Most common presenting symptoms are impulsivity, negative self-image, affect dysregulation, concentration problems and aggression.

Complex PTSD: “Developmental Trauma Disorder”

Developmental Trauma Disorder

A. Exposure

- Multiple or chronic exposure to one or more forms of developmentally adverse interpersonal trauma (eg, abandonment, betrayal, physical assaults, sexual assaults, threats to bodily integrity, coercive practices, emotional abuse, witnessing violence and death).
- Subjective experience (eg, rage, betrayal, fear, resignation, defeat, shame).

B. Triggered pattern of repeated dysregulation in response to trauma cues

Dysregulation (high or low) in presence of cues. Changes persist and do not return to baseline; not reduced in intensity by conscious awareness.

- Affective.
- Somatic (eg, physiological, motoric, medical).
- Behavioral (eg, re-enactment, cutting).
- Cognitive (eg, thinking that it is happening again, confusion, dissociation, depersonalization).
- Relational (eg, clinging, oppositional, distrustful, compliant).
- Self-attribution (eg, self-hate, blame).

C. Persistently Altered Attributions and Expectancies

- Negative self-attribution.
- Distrust of protective caretaker.
- Loss of expectancy of protection by others.
- Loss of trust in social agencies to protect.
- Lack of recourse to social justice/retribution.
- Inevitability of future victimization.

D. Functional Impairment

- Educational.
- Familial.
- Peer.
- Legal.
- Vocational.

Treatment



- The critical challenge now is to translate game-changing advances in developmental science into effective policies and practices for families w/ children to improve education, health and lifelong productivity

Health Outcomes (W.H.O. 2011)

- MH SYSTEM
- Health Department
- HOSPITALS
- DSS
- DJJ

10% IMPACT ON
HEALTH

- Nutrition
- Housing
- Safe neighborhoods
- Mentoring
- Relationships

90% IMPACT ON
HEALTH

Treat but...

- Education of the public about ACEs and impact
- Advocacy for prevention
- Education of policy makers to expand effective prevention interventions
- Programs that better protect children from abuse and violence by promoting stable and nurturing relationships for infants, children, adolescents and caregivers

Treatment

- Components of a trauma treatment:
 - Safety in one's environment
 - Skills building in emotional and behavioral regulation
 - Growing positive attachment relationships
 - Meaning making
 - Developing positive sense of self
- A “bottom-up” approach is ideal
- Intervention needs to be tailored to the developmental stage of the patient

Factors to consider

- Timing of the trauma
 - Recent events or recent disclosures of past traumatic events with symptoms of PTSD may benefit from a brief intervention
- Single Versus Repeated/Multiple traumas
 - Prepare families for lengthy treatment or need to return for additional courses of treatment at subsequent developmental stages
 - Assess for, recognize and intervene for cognitive and developmental issues.

- Comorbid symptoms
- Age of the child
 - Younger children are likely to benefit from dyadic approaches
 - Older children benefit more from individual or group therapy
- Safety Concerns
 - If ongoing threat of violence continues during treatment make sure to add appropriate case management and to coordinate with children's services, law enforcement and prosecutors.

- Provide parents information on Adverse Childhood Experiences
- Understand and learn about parents' adverse childhood experiences
- Refer parents for resources to help them address their own stress and health concerns.

Psychotherapeutic interventions

- SMART
- TF-CBT
- ARC Model
- Child-parent psychotherapy (3-5 y/o)
- Preschooler-parent psychotherapy
- EMDR
- Play therapy
- School-based or group therapies

Ancillary therapies

- Sensory integration, OT
- Yoga
- Neurofeedback
- Animal-assisted therapy
- Acupuncture
- Recreational therapy, music therapy, art therapy

Psychopharmacologic treatments

- Typically not curative and generally symptom reduction obtained with psychotherapy is larger than that associated with pharmacology.
- Antidepressants
 - Not particularly beneficial in kids with PTSD or complex trauma
 - Use if comorbid depression or anxiety exist

- Antiadrenergic agents

- Guanfacine: decreased scores for re-experiencing, avoidant, and hyperarousal symptoms
- Clonidine: also has been shown to attenuate reenactment symptoms in children
- Prazosin: may be effective as an adjunctive treatment as well as monotherapy based on case reports
- Propranolol: might be helpful to decrease symptoms

- Second generation antipsychotics
 - Risperidone and quetiapine have some evidence. In adults they are reserved for comorbid psychosis or overwhelming agitation and aggression.
- Mood stabilizers
 - Carbamazepine and divalproex have some evidence
- Other medications
 - Cyproheptadine has been observed to reduce nightmares associated with PTSD.
 - Benzodiazepines generally contraindicated for traumatized individuals, especially in pediatric populations.
 - Naltrexone has shown some efficacy in adults in reducing dissociative symptoms, posttraumatic flashbacks and self-injurious behaviors in adults.

Conclusions

- Exposure to traumatic events is common and associated with negative outcomes.
- Complex trauma presents with persistent, early and repetitive trauma and typically presents with **dysregulation** in different domains of functioning.
- There is a direct impact of trauma in the developing brain, which contributes to the clinical manifestations in pediatric populations.
- **Prevention is key**
- Psychotherapeutic interventions and ancillary therapies show more promising results in symptom reduction as compared to psychopharmacological treatments.

Resources

- <https://www.nctsn.org/>
- <https://www.samhsa.gov/child-trauma/understanding-child-trauma>
- <https://www.acesconnection.com/>
- <https://www.childtrauma.org/>

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