The Biology and Impacts of Trauma

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Objectives

• Understand trauma and the different types of trauma
• Understand the impact of trauma on genetic expression and brain development
• Increase knowledge regarding trauma symptoms
• Understand the impact of trauma on the ARC model (attachment, regulation & skill competency)
Is This Trauma
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What is Trauma?

Trauma is exposure to death, threatened death, actual or threatened serious injury, actual or threatened sexual violence as follows: – DSM (V)

• Direct
• Witnessing, in person
• Indirectly, by learning someone close was exposed to trauma
• Repeated or extreme indirect exposure to aversive details of the event(s), usually in the course of professional duties

• Other diagnostic criteria
  • Intrusive symptoms (re-experiencing)
  • Avoidance
  • Negative alteration in cognitions and mood
  • Alterations in arousal and reactivity
Types of Trauma

- Acute
- Chronic
- Complex
Acute trauma is a single traumatic event that is limited in time. Examples include:

- Serious accidents
- Community violence
- Natural disasters
- Sudden or violent loss of loved one
- Physical or sexual assault
Chronic Trauma

Refers to the experience of multiple traumatic events...
Complex Trauma

Describes both exposure to chronic trauma, usually caused by adults entrusted with the child’s care, and the impact of such exposure on the child (abuse, extreme neglect).
Trauma and Gene Expression

- Gene Methylation
- Chronic Stress Impact
Trauma and Cellular Aging

Telomeres
Trauma and the Immune System

- Microglial Cells
- Lymphatic Brain Pathway
Trauma and the Stress Response

Moderated Stress Response
- Sympathetic Nervous System
- Cortisol
- Adrenaline
- Default Mode Network
Changes in Brain Structures

- Amygdala
- Hippocampus
- Corpus Callosum
- Prefrontal Cortex
Trauma and Brain Development

Changes in Neural Pathways

- Hypersensitive Amygdala
- Hyperactive SNS
- Hypoactive Prefrontal Cortex

External event seen as a threat by individual

Flight/Fight response activated

- Heart rate increased
- Breathing increased
- Fats and Glucose released for energy
- Blood flow diverted from non-essential body areas to muscles and brain
- Perspiration increased
- Immune system suppressed

Adrenaline, noradrenaline and cortisol released
Trauma and Brain Development

Changes in Neurotransmitters

- Norepinephrine
- Serotonin
Trauma Symptoms

- Reliving the Experience
- Avoidance and Numbing
- Increase Arousal
Re-experiencing the Trauma

• Recurrent images and thoughts
• Recurrent and distressing dreams
• Distress at exposure to cues that symbolize the traumatic event
• Physiological reactivity
Avoidance and Numbing

- Efforts to avoid thoughts and feelings
- Efforts to avoid activities, places or people
- Inability to recall important aspects of the trauma
- Diminished interest in activities
- Feeling detached from others
- Restricted range of affect
- Sense of foreshortened future
Increased Arousal

- Difficulty falling asleep
- Irritability or outbursts of anger
- Difficulty concentrating
- Hypervigilance
- Exaggerated startle response
Challenges to Positive Attachment

- Suspicion of others; preoccupied with perceived threat
- Defiant and/or aggressive towards peers, caregivers or adults
- Non-discerning in making friends or sharing information
- Unaware of their own emotions
- Not attuned to others’ emotions
- Avoids asking for help or communicating needs
- Needy and demanding behavior
- Allows oneself to be victimized by others
- Isolative behaviors
- Engages in loud attention seeking behavior
- Inappropriate attempts to gain intimate contact
Challenges to Self-Regulation

- Hypersensitive to physical contact
- Hyper vigilance
- Hyper arousal
- Somatization
- Inability to be mindful
- Disturbances in regulation of bodily functions
Challenges to Competency

- Pessimistic and hopeless outlook
- Lacking a sense of meaning or purpose in life
- Perceptions of self
  - Low self-efficacy
  - Low self-worth
- Difficulties in the following:
  - Focusing on the task at hand
  - Planning and future-oriented thinking
  - Predicting consequences for one’s actions
  - Setting realistic, achievable goals
- Developmental skills deficiencies
Questions or Comments?
Resources

- The Children’s Hospital of Los Angeles, Providing Shelter from the Storm: Trauma-Informed Care

- Dr. Christoph Czermak, Society of Biological Psychiatry 66th Annual Meeting; May 13, 2011; San Francisco, California

- The University of Oklahoma National Resource Center, RHYTTAC, 2011, Train the Trainers

- Hollywood Homeless Youth Partnership, The ARC Framework for Runaway and Homeless Youth Serving Agencies

- Participants in Partnership: Adults and Youth Working Together, New York State Youth Council from the National 4H Council Youth Adult Partnerships Training Curriculum