Trauma-Informed Care:  

A New Paradigm for the NICU

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Objectives

Upon completion of the learning session participants will:

• Understand the concept of trauma-informed care
• Describe how early adverse life events impact the biology of the developing human
• List 3 psychopathologic outcomes associated with the experience of developmental trauma

NICU Trauma

Maternal separation  
Hospitalization & Sleep Deprivation  
Pain & Stress  
Anxiety / Fear  
Isolation  
Loss of trust
Trauma and the brain

- Trauma creates chaos in our brain.
- Trauma causes an emotional as well as a cognitive concussion.
- If trauma occurs as a child it hard-wires the experience.

Lai & Huang 2011
The Acute Response to Threat

<table>
<thead>
<tr>
<th>Adaptive Response</th>
<th>REST (Adult male)</th>
<th>VIGILANCE</th>
<th>FREEZE</th>
<th>FLIGHT</th>
<th>FIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyperarousal Continuum</td>
<td>REST (Male child)</td>
<td>VIGILANCE (Crying)</td>
<td>RESISTANCE Freeze</td>
<td>DISTANCE &quot;Posturing&quot;</td>
<td>AGGRESSION</td>
</tr>
<tr>
<td>Dissociative Continuum</td>
<td>REST (Female child)</td>
<td>AVOIDANCE (Crying)</td>
<td>COMPLIANCE Freeze</td>
<td>DISSOCIATION &quot;Numbing&quot;</td>
<td>FAINTING &quot;Mini-psychosis&quot;</td>
</tr>
<tr>
<td>PRIMARY Secondary Brain Areas</td>
<td>NEOCORTEX Subcortex</td>
<td>SUBCORTEX Limbic</td>
<td>LIMBIC Midbrain</td>
<td>MIDBRAIN Brainstem</td>
<td>BRAINSTEM Autonomic</td>
</tr>
<tr>
<td>Cognition</td>
<td>ABSTRACT</td>
<td>CONCRETE &quot;EMOTIONAL&quot;</td>
<td>REACTIVE</td>
<td>REFLEXIVE</td>
<td></td>
</tr>
<tr>
<td>Mental State</td>
<td>CALM</td>
<td>AROUSAL</td>
<td>ALARM</td>
<td>FEAR</td>
<td>TERROR</td>
</tr>
</tbody>
</table>

Neurobiology of emotion regulation

https://www.youtube.com/watch?v=xNY0AAUtH3g

Mirror neuron

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Pain, touch, procedures, restraint, postural orientation etc.

Maternal separation, isolation, sleep deprivation etc.

Light, sound, smell, taste etc.

Stress & the HPA axis
Positive Stress  
Brief increase in heart rate, mild elevations in stress hormone levels

Tolerable Stress  
Serious, temporary stress response buffered by supportive relationships

Toxic Stress  
Prolonged activation of stress response systems in the absence of protective relationships

Toxic Stress Derails Healthy Development

https://www.youtube.com/watch?v=rVwFkcOZHJw
Allostasis - process of achieving stability or homeostasis through physiological or behavioral change.

Boekelheide et al. 2012

Bioknitro et al. 2012
"Psychosocial deprivation within any caregiving environment during early life must be viewed with as much concern as any debilitating childhood disease." Johnson & Gunnar 2011

Long term implications of developmental trauma

- It is estimated that 50-70% of infants born preterm develop behavior problems including internalizing and externalizing problems and symptoms of Attention Deficit/Hyperactivity Disorder (ADHD)
- Infants hospitalized for CHD increase their risk for neurodevelopmental compromise if their postop LOS is > 2 weeks

Compared with term births:

- Infants born 32-36 weeks were:
  - 1.6 x more likely to have nonaffective psychosis (schizophrenia)
  - 1.3 x more likely to have depressive disorder
  - 2.7 x more likely to have bipolar disorder

- Infant's born < 32 weeks were:
  - 2.5 x more likely to have nonaffective psychosis (schizophrenia)
  - 2.9 x more likely to have depressive disorder
  - 7.4 x more likely to have bipolar disorder

Economic Implications
Other Morbidities

- Risk of violent suicide attempts patients born prematurely (OR [95%] = 2.38 [1.12–5.08])
  (Blasco-Fontcuberta et al 2013)
- Risk of cardiovascular disease in adulthood
  (Lamendola et al 2013)
- Risk of metabolic syndrome and obesity in adulthood
  (Thomas et al 2012; Finken et al 2011)
Neural Plasticity

Top-Down and Bottom-Up Information Flow

Neocortex
Meaning - Belief - Attitudes - Self Talk

Limbic
Mood - Emotions

Brain Stem
Sensation - Feelings - Body Experience

LaPierre & Heller 2012

Neonatal Infant Stressor Score

Newnham et al. 2009
The oxytocin system important for increasing fear extinction and social functioning after trauma.
Unless someone like you cares a whole awful lot, nothing is going to get better. It's not.

Dr. Seuss, The Lorax
References


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