Trauma-Informed Care: A New Paradigm for the NICU

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The speaker has signed a disclosure form and indicated she has no significant financial interest or relationship with the companies or the manufacturer(s) of any commercial product and/or service that will be discussed as part of this presentation.

Session Summary

A traumatic event is an experience that causes physical, emotional, psychological distress, or harm and is perceived and experienced as a threat to one’s safety or to the stability of one’s world. It involves a single experience or an enduring or repeating event(s) that completely overwhelms the individual’s ability to cope or integrate the ideas and emotions involved with that experience. This session introduces the concept of trauma-informed care in the NICU and describes the physiological, neurobiological and psychoemotional vulnerabilities of the premature and critically ill newborn to the experience of trauma in the NICU.

Session Objectives

Upon completion of this learning session, the participant will be able to:

- discuss the concept of trauma-informed care;
- describe how early adverse life events impact the biology of the developing human;
- list three psychopathologic outcomes associated with the experience of developmental trauma.

References


**Session Outline**

See presentation handout on the following pages.
**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

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**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.

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**NICU Trauma**

- Maternal separation
- Hospitalization & Sleep Deprivation
- Pain & Stress
- Anxiety / Fear
- Isolation
- Loss of trust

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**Effects of early environments on HPA axis & neurobehavioral development**

- Duration of effect: transient
- Duration of effect: permanent

- Neurotoxicity
- Morphological changes
- Synaptic plasticity modification
- Effects on neurobehavior:
  - Cognition
  - Emotional reactivity
  - Euthymia

- Early environment
- HPA axis development
- Brain development

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**Trauma-Informed Care:**

*A New Paradigm for the NICU*

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## 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>
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</thead>
<tbody>
<tr>
<td>Hyperarousal Continuum</td>
<td>REST (Male child)</td>
<td>VIGILANCE (Crying)</td>
<td>RESISTANCE</td>
<td>DEFiance</td>
<td>POSTuring</td>
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<tr>
<td>Dissociative Continuum</td>
<td>REST (Female child)</td>
<td>AVOIDANCE (Crying)</td>
<td>COMPLIANCE</td>
<td>DISSOCIATION</td>
<td>&quot;Numbing&quot;</td>
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<td>PRIMARY Secondary Brain Areas</td>
<td>NEOCORTEX</td>
<td>SUBCORTEX Limbic</td>
<td>LIMBIC Midbrain</td>
<td>MIDBRAIN Brainstem</td>
<td>BRAINSTEM Autonomic</td>
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<tr>
<td>Cognition</td>
<td>ABSTRACT</td>
<td>CONCRETE</td>
<td>&quot;EMOTIONAL&quot;</td>
<td>REACTIVE</td>
<td>REFLEXIVE</td>
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<tr>
<td>Mental State</td>
<td>CALM</td>
<td>ARousAL</td>
<td>ALARM</td>
<td>FEAR</td>
<td>TERROR</td>
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## Neurobiology of emotion regulation

![Neurobiology of emotion regulation diagram](https://www.youtube.com/watch?v=xNY0AAUtH3g)

## Mirror Neuron

![Mirror Neuron](image)

## Trauma-Informed Care

![Trauma-Informed Care](image)

https://www.youtube.com/watch?v=xNY0AAUtH3g
Pain, touch, procedures, restraint, postural orientation etc.

Maternal separation, isolation, sleep deprivation

Light, sound, smell, taste etc.

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

Allostasis - process of achieving stability, or homeostasis, through physiological or behavioral change

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

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Allostasis - process of achieving stability, or homeostasis, through physiological or behavioral change.

Boekelheide et al. 2012

General Stress of Prematurity

Allostatic Load

Complications of Prematurity

Derived from the allostatic load model by McEwen (1998b).

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

- Risk of violent suicide attempts patients born prematurely (OR [95%] = 2.38[1.12–5.08])
- Risk of cardiovascular disease in adulthood
- Risk of metabolic syndrome and obesity in adulthood

Other Morbidities

- Economic Implications
- Early relational trauma
The oxytocin system important for increasing fear extinction and social functioning after trauma.

Stress

Unpredictable  Predictable

Severe  Moderate

Vulnerability  Resilience

Mind the Gap

Clinical & Neurobiological Findings

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Smith et al 2011

The oxytocin system important for increasing fear extinction and social functioning after trauma.

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