Understanding Trauma Related Behavior

Michael W. Naylor, M.D.
Director, Behavioral Health and Welfare Program
Clinical Characteristics of CARTS Youth

- **Child maltreatment**
  - physical/sexual abuse
  - neglect

- **Family characteristics**
  - mental illness and substance abuse
  - multigenerational history of abuse

- **Multiple placement disruptions**
Clinical Characteristics of CARTS Youth

- Emotional dysregulation
- Aggression
- Cognitive deficits
- Oppositional/defiant behavior
Developmental Psychopathology

- Events experienced during infancy and toddlerhood shape the child’s response patterns in later life
  - attachment
  - affect regulation
  - development of self
Attachment

- Internalized representation of the primary caregiver
  - molded by dyadic relationship between mother and infant
  - organizes physiological systems required to modulate levels of arousal
  - necessary for developing sense of self
Attachment

- Emergence of sense of self is too important to leave to chance
  - guided by gene /environment interaction
    - genetic
      - brain structure
      - temperament
    - environment
      - relationship with attuned, empathic caregiver
Attachment

- **Normal development**
  - infant undifferentiated from environment and primary caregiver
  - aware of internal feelings of discomfort
  - no neural or behavioral mechanisms to verbally communicate needs, organize response to get needs met, or means of self-soothing/self-regulation
Attachment

- **Normal development**
  - mother is attuned to infant’s affective state and level of arousal
  - direct face-to-face interaction between infant and mother (“lock-in”)
  - affect and physiology synchronized (reverberating feedback loop)
  - baby’s affect and level of arousal is regulated through this interaction
Attachment

- Normal development
  - infant experiences need, experienced as negative affect
  - mother surmises cause of infant’s distress and initiates strategy to reduce infant’s distress
  - re-establishing positive feeling state teaches infant that negative affect can be tolerated
Attachment

■ Normal development
  – consistent mother-infant interaction with successful affective attunement
    » feeling of safety
    » origin of trust
    » origin of frustration tolerance
    » development of self-regulatory skills
Attachment

- Positive dyadic communications stored as nonverbal memories
  - event + emotional state + associated physiological state + regulatory strategies
  - can be triggered by environmental events that approximate those in memory
  - can reactivate associated physiological regulatory processes
Attachment

- Right hemisphere of the brain mediates attachment
  - storage of internal model of attachment relationship
  - reception, expression, and communication of affect
  - awareness of internal state
  - regulation of affect state
  - regulation of autonomic reactions
Attachment

- Right hemisphere of the brain develops first
  - dominant hemisphere until age 3 or 4
  - early attachment memories stored nonverbally
Brain development is dependent on experience (use-dependent organization)
- sensitization - repeated activation leads to increased responsivity
  » activation generalizes to other aspects of traumatic event
  » enhanced physiological response to stressors
Neurobiology of Trauma

- Two types of trauma
  - Type I trauma
    » single episode or recurrent
    » threats to body integration
    » threats to life
  - Type II trauma
    » relational trauma
      ■ abuse and neglect
    » cumulative
Relational trauma
- 80% of maltreated infants/toddlers have disorganized attachment
  » high proximity-seeking
  » high avoidance
  » high resistance
Neurobiology of Trauma

- Relational trauma
  - primary caregiver not able to help infant regulate arousal
    » lack of attunement
    » unable to tolerate infants negative affective states
    » nonverbal expression of anger aggression, and rage towards child
  - mother-infant dyad escalates
Neurobiology of Trauma

- Relational trauma
  - primary caregiver’s reaction alarms infant
    » flee
    » approach
Neurobiology of Trauma

Adaptation

Threat (real or perceived)

Arousal Continuum
1) NOREPINEPHRINE
   locus coeruleus
2) DOPAMINE
   nigrostriatal/mesolimbic
3) GABA
4) SEROTONIN

Dissociative Continuum
1) OPIOID PEPTIDES
2) SEROTONIN
3) DOPAMINE
   mesolimbic/mesocortical
# Neurobiology of Trauma

## Adaptive Response Continuum
- **Rest**
- **Vigilance** (crying)
- **Freeze**
- **Flight**
- **Fight**

## Hyperarousal Continuum
- **Rest**
- **Vigilance (crying)**
- **Resistance**
- **Defiance (posturing)**
- **Aggression**

## Dissociative Continuum
- **Rest**
- **Avoidance (crying)**
- **Compliance**
- **Dissociation (numbing)**
- **Fainting**

## Primary Brain Area
- Neocortex
- Subcortex
- Limbic
- Midbrain
- Brainstem

## Cognition
- Abstract
- Concrete
- Emotional
- Reactive
- Reflexive
Neurobiology of Trauma

- Hyperarousal continuum
  - alarm reaction → fight-or-flight response
  - mediated by sympathetic nervous system
    » increased heart-rate, blood pressure
    » increased muscle tone
    » increased arousal
    » increased motor activity
Neurobiology of Trauma

- Hyperarousal continuum
  - reactivation of response
    » re-exposure to trauma
    » reminders of trauma
    » thoughts about trauma
  - frequent reactivation results in sensitization
“TICK-TOCK, TICK-TOCK, TICK-TOCK, TICK-TOCK, . . .”
Neurobiology of Trauma

- Hyperarousal continuum
  - fear response sensitized
    » hyperreactivity
"Hey! You wanna kick me? Go ahead! C'mon, tough guy! Cat got your tongue? Maybe he took your whole brain! ... C'mon! Kick me!"
Neurobiology of Trauma

- Dissociative continuum
  - mediated by parasympathetic nervous system
    - endogenous opiates
      - numbing
      - depersonalization
      - derealization
      - fugue
Neurobiology of Trauma

- Dissociative continuum
  - freezing
    » better sound localization
    » keener visual observation
    » ‘camouflage’
    » time to organize and ‘figure out’ response
Neurobiology of Trauma

- Determinants of type of response
  - age
  - sex
  - type of trauma
    » immobilization, inescapability, and pain
Neurobiology of Trauma

- Determinants of response
  - rapid escalation through states of arousal
  - can switch rapidly from hyperarousal to dissociation and back
Development of Self

- Self-regulation
- Self-worth
- Empathy
- Understanding self-other relationships
Development of Self

- Impaired self-regulation
  - generalization of regulation strategies to non-threatening situations
  - behavioral sensitization
  - hypervigilance
  - disconnection of internal experience of affect from external expression

» alerts the child but prevents affects from incapacitating him/her
Development of Self

- Impaired self-regulation
  - affect dysregulation leads to behavioral dyscontrol
    » anger, frustration, and noncompliance
    » hyperactivity and distractibility
    » aggressive
Development of Self

- Impaired self-regulation
  - trauma affects interhemispheric connections via corpus callosum
    » emotional information processed and stored in right hemisphere not accessible by left hemisphere
    » verbally mediated problem solving skills
What we say to dogs

Okay, Ginger! I've had it! You stay out of the garbage! Understand, Ginger? Stay out of the garbage, or else!

What they hear

blah blah GINGER blah blah blah blah blah blah...
Development of Self

- Decreased self-worth
  - negative representations of self
    » lower self-esteem
    » decreased sense of mastery and competence
    » greater symptoms of depression
Development of Self

- Impaired empathy
  - maltreatment affects child’s response to others
    » peer distress
      - anger
      - fear
      - aggression
Development of Self

- Impaired interpersonal relationships
  - difficulty establishing adaptive interpersonal relationships
  - atypical attachment patterns generalize
    » peer relationships
    » romantic relationships
    » parenting
Development of Self

- Impaired peer relationships
  - more physical and verbal aggression
  - respond with anger to friendly overtures from and distress in peers
  - avoidance of peer interactions
Development of Self

- Impaired peer relationships
  - peers have negative perceptions of maltreated children
    » less well-liked
    » more antisocial behaviors
    » fewer prosocial behaviors
  - peers are less likely to reciprocate
  - peer rejection and isolation
Development of Self

- Pathological splitting
  - initially two internal representations of caregivers
    » “good”
    » “bad”
  - failure to integrate “good” “and bad” representations
Implications for Hospital Care Workers

- Maslow’s Hierarchy of Needs
- Physiological or survival
- Safety
- Belongingness and love
- Esteem
- Self-actualization
Implications for Hospital Care Providers

- RTC must compensate for deficits:
  - different understanding of teen’s behavior
  - corrective primary caregiving experience
  - regulate level of stimulation
  - facilitate social interactional skills
  - structure and limits