Mitigating the Effects of Toxic Stress

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Home Visiting: Expanding Horizons
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AGENDA

- What is toxic stress (TS) and what are its effects?
- What interventions can buffer children against the effects of TS?
- How can we address TS within home visiting programs?
TOXIC STRESS: “Strong, frequent, and/or prolonged activation of the body’s stress-response system in the absence of stable adult support” (Shonkoff, 2010; p. 360)
Toxic Stress: Risks and Contexts

- Poverty
- Sociodemographic risk (e.g., teen mother, single parent, < HS education)
- Intimate Partner Violence
- Parental mental illness
- Parental substance use/abuse
- Compromised parenting and child maltreatment
Child toxic stress: strong, frequent, prolonged activation of children's stress-response system (Gunnar et al., 2009; Fernald & Gunnar, 2009; Cicchetti et al., 2010; Fischer et al., 2011)

- Increased heart rate and blood pressure
- Release of stress hormones such as cortisol
  - Atypical production in response to stress
  - Atypical diurnal pattern
    - Blunted pattern
- Lower threshold for response to stress
- Stress response mediated by caregiving
Toxic Stress (Shonkoff et al., 2009)

- Negative physiologic outcomes
  - Disrupted brain architecture and functioning
  - Effects on other organ systems
    - Premature/LBW African American infants
- Negative child outcomes
  - Health/cognitive/mental health challenges
- Root of adult physical/mental health disparities between SES groups
Psychological Consequences of Toxic Stress for Young Children

- Increased arousal
  - Increased distress sensitivity to non-stressful events
- Developmental delays
- Executive functioning issues
  - Concentration
  - Impulse control
- Cognitive/Language delays
- Academic challenges (school readiness)
- Internalizing problems
  - anxiety, depression
- Externalizing problems
  - tantrums, oppositionality, defiance, aggression
Toxic Stress

Persistent Stress Changes Brain Architecture

Normal

Typical neuron—many connections

Toxic stress

Damaged neuron—fewer connections

Prefrontal Cortex and Hippocampus

Sources: Radley et al. (2004)
Bock et al. (2005)
Extreme Neglect Diminishes Brain Power

Institutionalized

- 3-5 Hz
- 6-9 Hz
- 10-18 Hz

Never Institutionalized

Neurobiology of Toxic Stress

- Prefrontal cortex
  - Conscious thought, executive functioning
- Hypothalamus
  - Hypothalamic-pituitary-adrenal (HPA) axis – cortisol production (stress hormone)
- Hippocampus
  - Learning, cognition, memory
- Amygdala
  - Fear & other emotions, memory, decision-making
- Corpus callosum
  - Communication of 2 hemispheres
Neurobiology of Toxic Stress

• Overall damaging of brain functioning
  – Smaller brain volume, larger fluid-filled cavities, less connective matter

• Atrophy and dysfunction of hippocampus, amygdala, and medial prefrontal cortex

• Less dense corpus callosum

• Changes in neurotransmitters
  – Norepinephrine (flight-fight)

• Altered diurnal patterns of cortisol production (HPA axis)
  – Blunted response
  – Elevated response
Adverse Childhood Experiences Study (ACES)

- Adverse Childhood Experiences (ACEs):
  - Emotional, physical or sexual abuse
  - Domestic violence against the mother
  - Household member with mental illness
  - Household member with substance abuse
  - Household member ever imprisoned

- Predict the 10 leading causes of adult death/disability

ACE Study, Felitti et al. 1998
Compared to those with 0 ACEs, people with 4+ adverse childhood experiences were:

• 2.2 times more likely to be smokers
• 4.6 times more likely to be depressed
• 12.2 times more likely to attempt suicide
• 7.2 times more likely to be alcoholics
• 4.5 times more likely to be drug users
• 5.5 times more likely to abuse their partners
Lifespan Effects of ACEs to Health & Well Being

Mechanisms by Which Adverse Childhood Experiences Influence Health and Well-being Throughout the Lifespan

From acestudy.org
THREE PATHWAYS TO ADDRESS TOXIC STRESS

**PRIMARY PREVENTION**
- Decreasing poverty, and fostering community and social well-being
- Community-based public health, universal education, and income support approaches

**SECONDARY PREVENTION**
- Reducing environmental risks for toxic stress
- Programs that provide early care and education, parent education, family support, income support

**TERTIARY PREVENTION**
- Providing interventions for children exposed to toxic stress
- Child, parent, dyadic, family, classroom interventions
Evidence-Based Preventive Interventions

- **Parent-Child Interaction Therapy** *(Chaffin et al.)*
  - Coaching parent to improve parent-child relationship & parental behavior management skills

- **Attachment and Biobehavioral Catch-up** *(Dozier et al.)*
  - Short-term intervention with specific targets
    - nurturance and responsivity to infants
    - “overriding” one’s past experience of caregiving

- **Child-Parent Psychotherapy** *(Lieberman et al.; Toth et al.)*
  - Infant mental health dyadic treatment focused on enhancing parent-child relationship

- **Child FIRST** *(Lowell et al.)*
  - Relationship-based infant mental health approach
  - Parent-child psychotherapy and case management

* tested with child welfare populations
Evidence-Based Preventive Interventions

- **Family Check-Up** (Dishion, Shaw et al.)
  - Short-term intervention to promote positive parenting and behavior management
- **Safe Care** (Lutzker et al.)
  - Parent-child interaction; safety; maltreatment
- **Promoting First Relationships*** (Spieker et al.)
  - Infant mental health approach
- **Healthy Families** (Duggan, DuMont et al.)
  - Child maltreatment prevention over first five years
- **The Incredible Years** (Webster-Stratton et al.)
  - Parent management, group-based intervention
- **Nurse Family Partnership** (Olds et al.)
  - Maternal-child development intervention over first five years

* tested with child welfare populations
Attachment & Biobehavioral Catch-up (ABC) Program

• Developed by Mary Dozier, University of Delaware
• Grounded in attachment theory and research
• Manualized intervention
• Two randomized trials with children in child welfare
  • Foster & Birth parents
• 10 sessions with mother-infant dyads at home
  • Use of videotape and in-the-moment commenting
Parental nurturance

Following child’s lead with delight

Reducing threatening and/or frightening caregiving behavior

“Overriding” one’s own history and/or non-nurturing instincts

Exclusive focus on these “target” behaviors
Benefits of ABC

- Randomized control trials
- Infants/toddlers in foster care
  - More likely to be securely attached to foster parents
  - More normal diurnal patterns of cortisol production
- Infants/toddlers in Child Protective Services
  - Mothers showed more sensitivity to infants
  - Infants less likely to have disorganized attachment and more likely to be securely attached

Dozier et al., 2006; 2007; 2008; 2009; Bernard & Dozier, 2012
GOALS

• Validate toxic stress
• Implement and evaluate evidence-based intervention
• Partner with Early Head Start programs
Buffering Toxic Stress Partners in Washington, DC & Suburban Maryland

- Lourie Center
- Centro Nía
- Family Services Inc
- United Planning Organization
- Rosemount Center
- University of Maryland
DESIGN

Randomized Trial
- EHS + Attachment and Biobehavioral Catch-up (ABC)
- EHS + Book-of-the Week (BOW)

Implementation Study
- Pilot Study & RCT
- Qualitative & Quantitative

Validating Toxic Stress
- Baseline and Post-Test Risk Data
- Child Physiologic Data at Post-test
Integrating ABC into Home-Based EHS

• Supplemental parenting intervention
• Resources for service delivery
  – videotaping
• Training of EHS staff
  – Home visitors
  – Mental health consultants
• EHS ≠ ABC
• Sustainability
CONCLUSIONS

• Toxic stress detrimental to early development and leads to negative physical, developmental, and mental health sequelae in adulthood

• Promotion of early relationships critical goal of parenting and mental health interventions
  – Can reduce effects of toxic stress

• Home visiting programs optimal mechanism for delivering evidence-based parenting interventions