

# Child and Adolescent Brain Development and the Role of Relationships and Experiences

Lee Savio Beers, MD  
-Associate Professor of  
Pediatrics  
-Medical Director for  
Municipal and  
Regional Affairs

Children's National  
Health System

September 14, 2017

August 17, 2017

# Goals and Objectives

- *At the conclusion of this presentation, the audience will be able to:*
  - Understand the basics of childhood brain development
  - Describe Adverse Childhood Experiences (ACE's), Trauma and Toxic Stress and their impact on youth brain development
  - Discuss how this impact can be mitigated through positive relationships

# Core Concepts and Questions

- How does the brain develop over childhood?
- How does adversity impact neurobiology, health and learning?
- How can the impacts of adversity be reduced or eliminated?
- How can school personnel play a role in supporting youth?

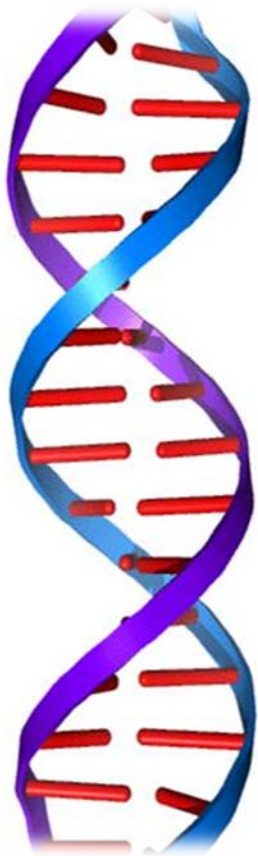
# How does the brain develop over time?

- The brain has billions of connections between individual neurons all across the brain
- These connections form, over time, but most during the earliest years of childhood
  - More than 1 Million every second!
  - From simple to complex
  - Influenced by your *genes*
  - Influenced by your *experiences*

*Developingchild.harvard.edu*



# *Genes and experiences interact to impact the developing brain*



+

Relationships

Quality of sleep

Nutrition

Environment

=



# Experiences good and bad influence brain development



# Three Types of Stress

Acute



Toxic



Tolerable







# What is Trauma?

- “Individual trauma results from an *event*, series of events, or set of circumstances that is *experienced* by an individual as physically or emotionally harmful or life threatening and that has lasting adverse *effects* on the individuals functioning and mental, physical, social, emotional or spiritual well-being”



# A History of Trauma—Events

- Actual or extreme threat of physical or psychological harm, for example....
  - Domestic violence
  - Child abuse
  - Neighborhood violence
  - Family conflict
  - Resource insecurity
  - Discriminatory treatment
- Severe neglect
- May occur as a single experience or repeatedly over time



# A History of Trauma—Experience

- Impacted by how individual assigns meaning to event
- Acute vs chronic
- Power differential leads to sense of powerlessness and questioning
- Mediated by cultural beliefs, social supports available and developmental/intellectual stage of individual
- Experience of trauma can be buffered by relationships

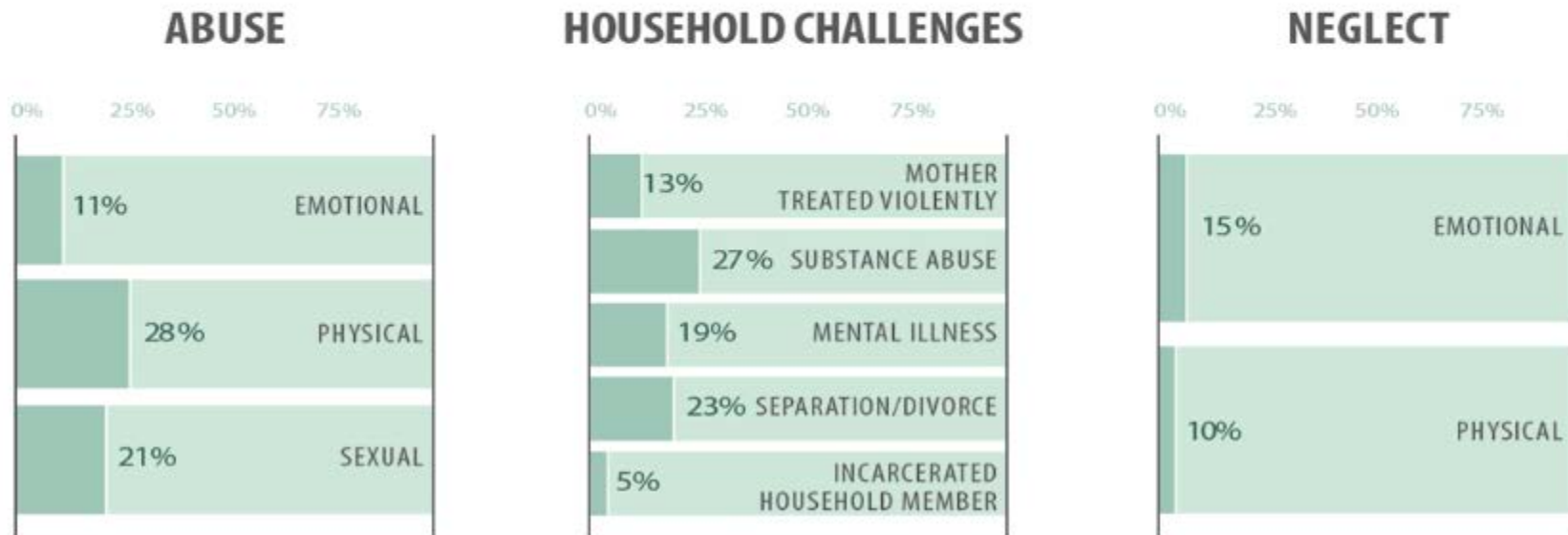
# A History of Trauma—Effects

- Immediate or delayed
- May (but not always) include...
  - Difficulty trusting and benefiting from relationships
  - Disrupted cognitive processes, such as memory, attention and thinking
  - Increased risk of chronic health conditions
  - Inability to cope with normal stresses and strains of daily living
  - Inability to regulate behavior or control the expression of emotions

# Adverse Childhood Experiences CDC-Kaiser Study Prevalence (1995-1997)

## TYPES of ACES

The ACE study looked at three categories of adverse experience: **childhood abuse**, which included emotional, physical, and sexual abuse; **neglect**, including both physical and emotional neglect; and **household challenges**, which included growing up in a household where there was substance abuse, mental illness, violent treatment of a mother or stepmother, parental separation/divorce or had a member of the household go to prison. Respondents were given an **ACE score** between 0 and 10 based on how many of these 10 types of adverse experience to which they reported being exposed.



# Child and Family Adversity in the US

**Table 1. National Prevalence of Adverse Child or Family Experiences based on the 2011/12 NSCH**

<b>Adverse Child or Family Experiences</b>	<b>National Prevalence</b>	<b>State Range</b>
Child had ≥ 1 Adverse Child/Family Experiences	47.9%	40.6% (CT) – 57.5% (AZ)
Child had ≥ 2 Adverse Child/Family Experiences	22.6%	16.3% (NJ) – 32.9% (OK)
Socioeconomic hardship	25.7%	20.1% (MD) – 34.3 % (AZ)
Divorce/parental separation	20.1%	15.2% (DC) – 29.5% (OK)
Lived with someone who had an alcohol or drug problem	10.7%	6.4% (NY) – 18.5% (MT)
Victim or witness of neighborhood violence	8.6%	5.2% (NJ) – 16.6% (DC)
Lived with someone who was mentally ill or suicidal	8.6%	5.4% (CA) – 14.1% (MT)
Domestic violence witness	7.3%	5.0% (CT) – 11.1% (OK)
Parent served time in jail	6.9%	3.2% (NJ) – 13.2% (KY)
Treated or judged unfairly due to race/ethnicity	4.1%	1.8% (VT) – 6.5% (AZ)
Death of parent	3.1%	1.4% (CT) – 7.1% (DC)

# ACES can have lasting effects on....



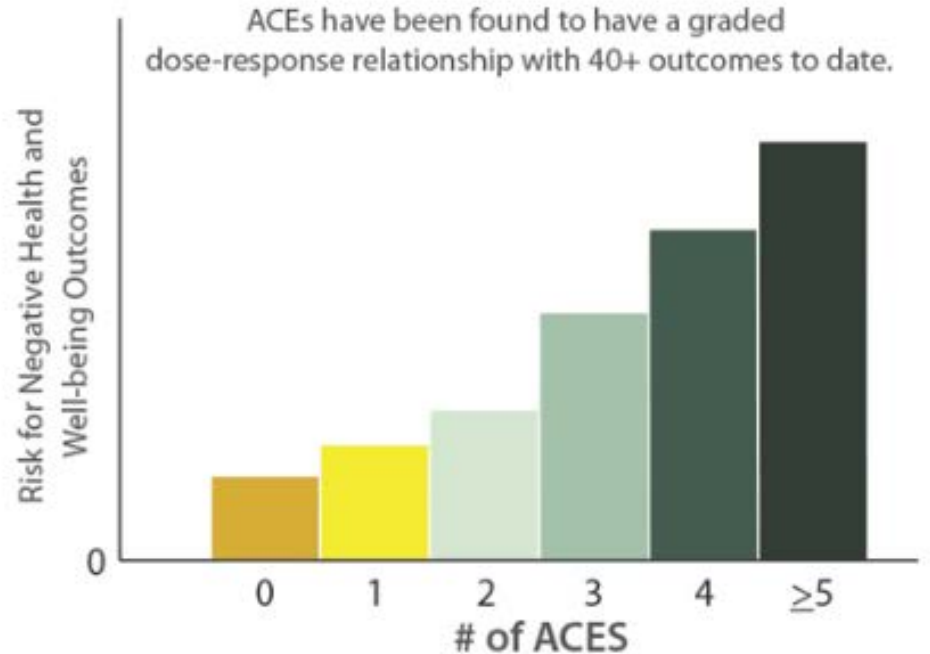
Health (obesity, diabetes, depression, suicide attempts, STDs, heart disease, cancer, stroke, COPD, broken bones)



Behaviors (smoking, alcoholism, drug use)



Life Potential (graduation rates, academic achievement, lost time from work)



\*This pattern holds for the 40+ outcomes, but the exact risk values vary depending on the outcome.

Centers for Disease Control and Prevention

September 14, 2017



Children's National™

# Toxic Stress Changes Brain Architecture

Normal



Typical neuron with many connections



Toxic Stress



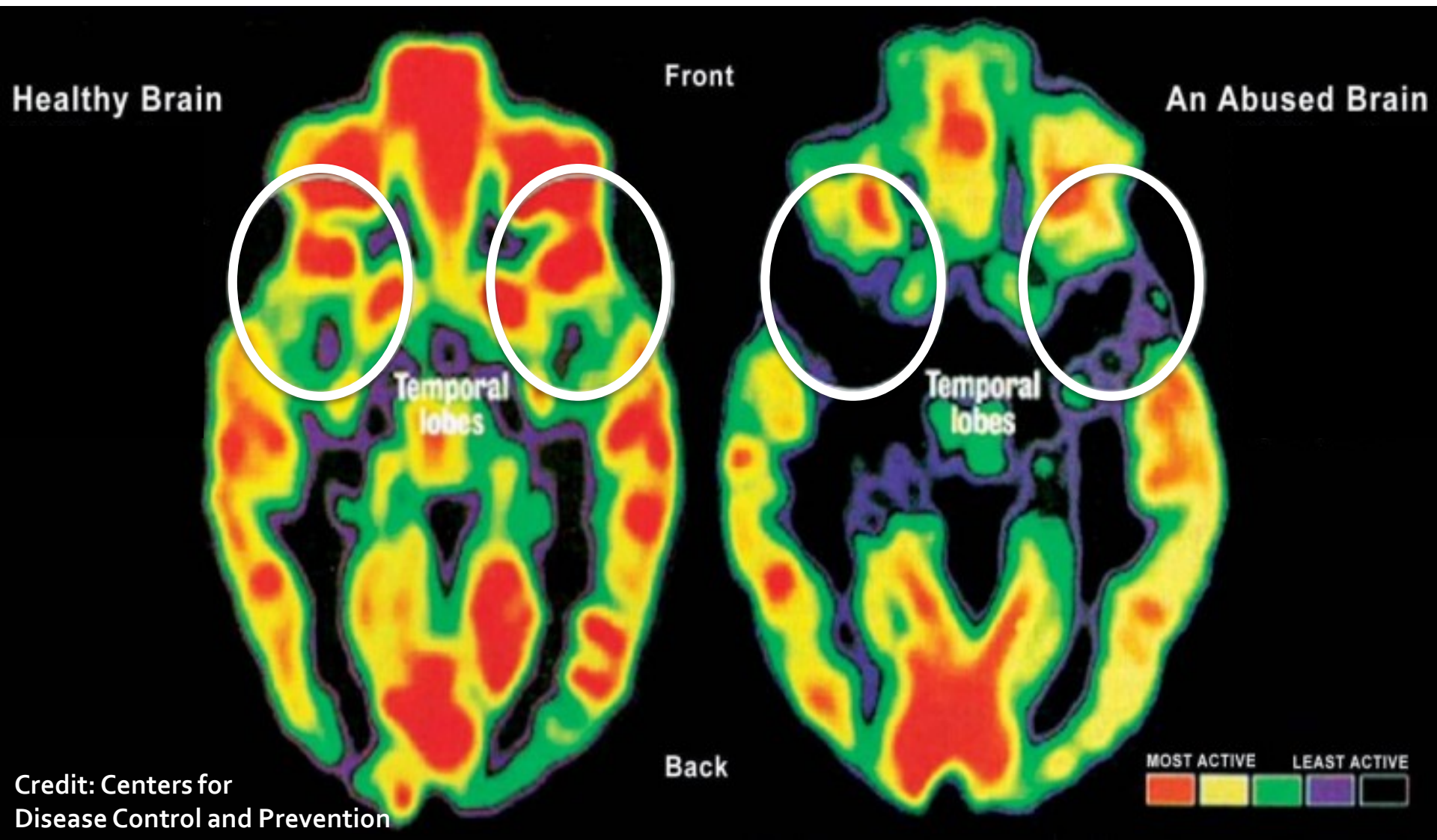
Neuron damaged by toxic stress -- fewer connections



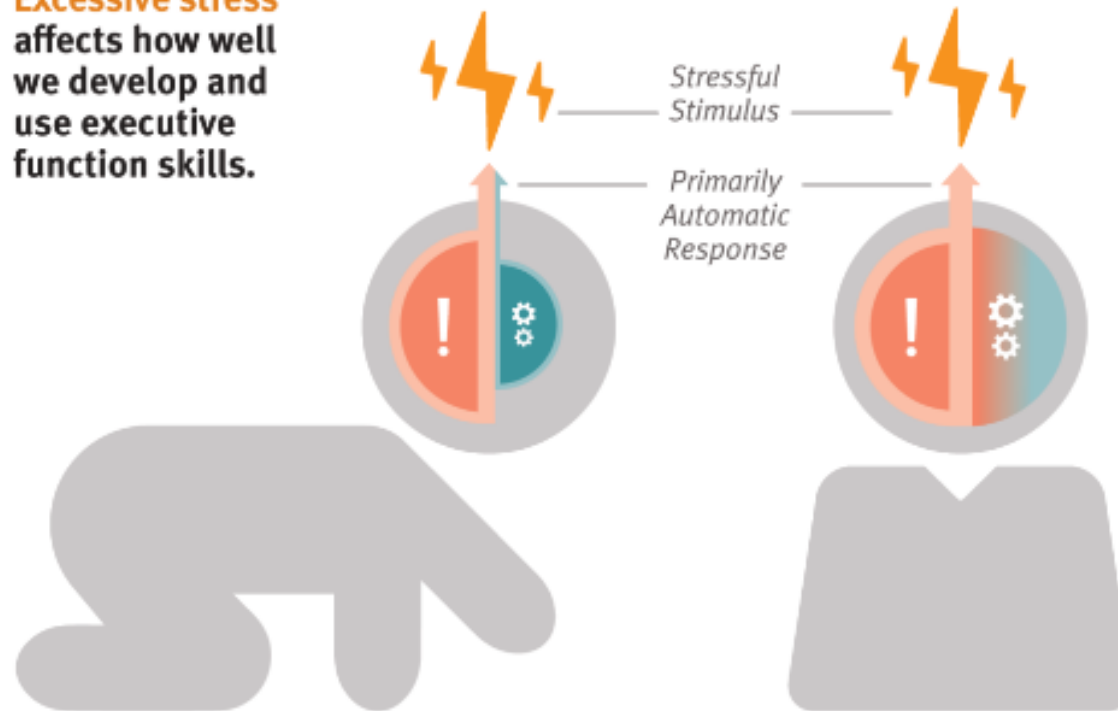
Prefrontal Cortex and Hippocampus

Center on the Developing Child, Harvard University





**Excessive stress affects how well we develop and use executive function skills.**



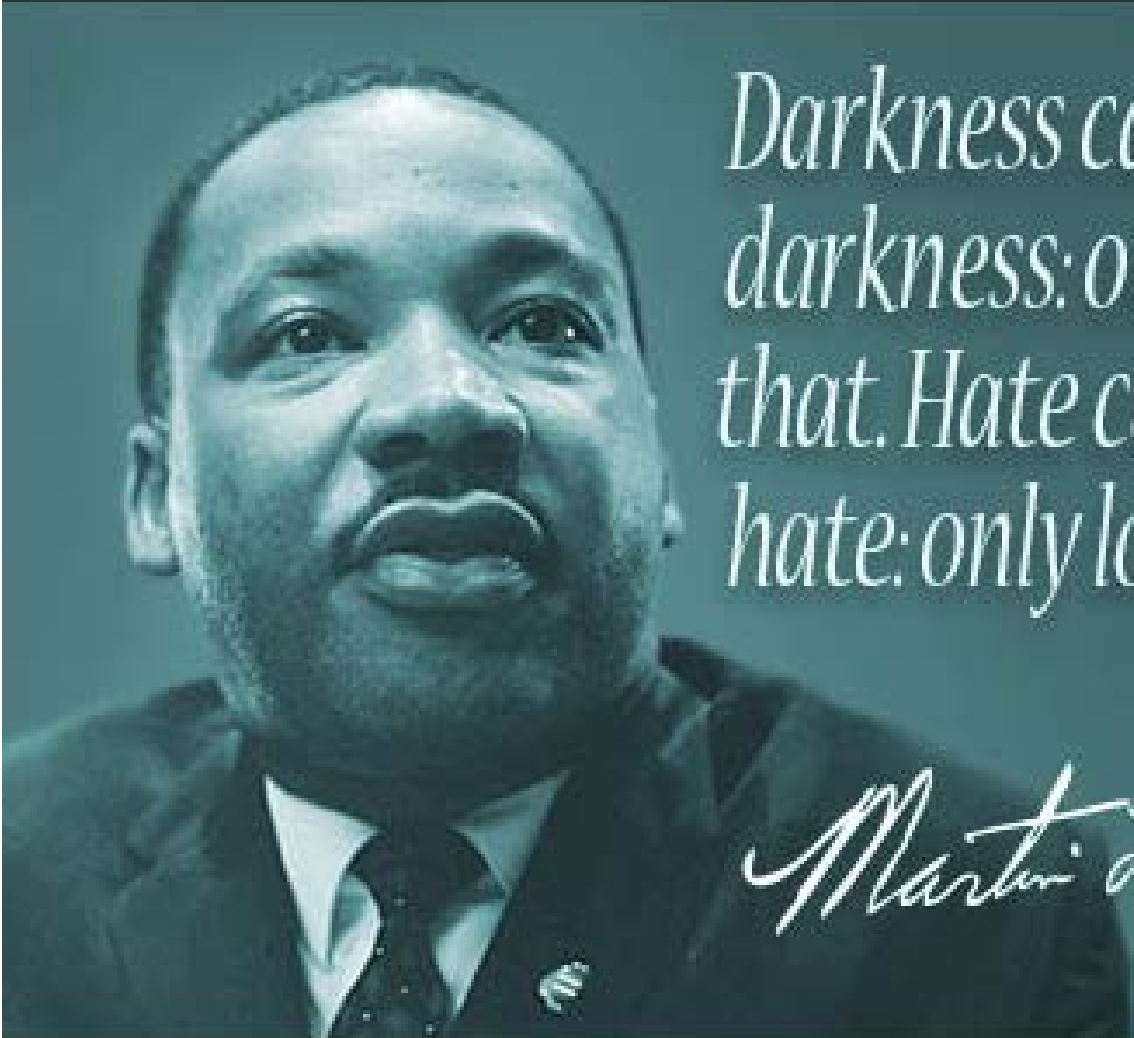
### **Early Childhood**

Severe, frequent stress redirects children's brain development away from planning and impulse control toward building the capacity for rapid threat response.

### **Adulthood**

Excessive stress overloads adults' ability to use executive function and intentional self-regulation skills, leaving them to rely primarily on automatic responses.





*Darkness cannot drive out  
darkness: only light can do  
that. Hate cannot drive out  
hate: only love can do that.*

*Martin Luther King Jr.*

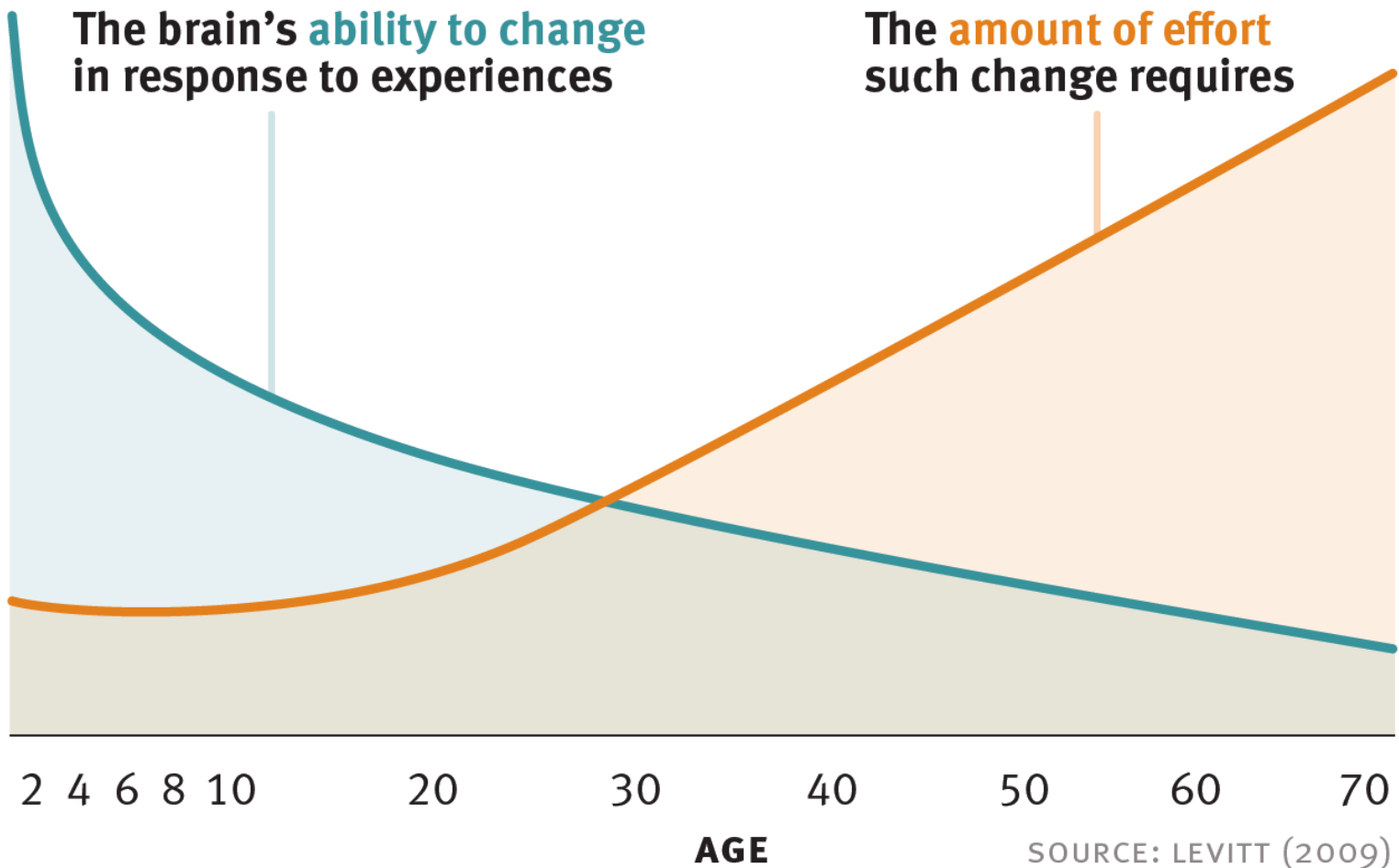


OXYTOCIN



CORTISOL





Center on the Developing Child  HARVARD UNIVERSITY

[www.developingchild.harvard.edu](http://www.developingchild.harvard.edu)

# Building resilience

- Strengthens executive functioning skills
- Improves academic and adult outcomes
- Can happen at any age



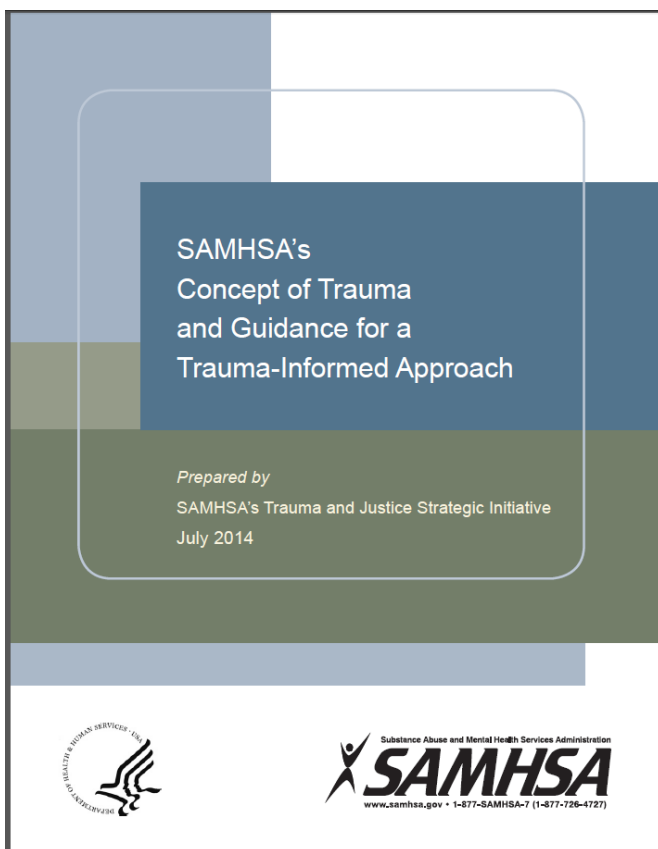
<http://developingchild.harvard.edu/science/key-concepts/resilience>

# Factors which predispose children to positive outcomes in the face of adversity

- Supportive adult-child relationships
- A sense of self-efficacy and perceived control
- Opportunities to strengthen adaptive skills and self-regulatory capacities
- Ability to mobilize sources of faith, hope, and cultural traditions

**The single most common factor  
for children who develop  
resilience is at least one stable  
and committed relationship with  
a supportive parent, caregiver, or  
other adult**





## Review of:

- Trauma focused research
- Practice-generated knowledge about trauma interventions
- Lessons articulated by survivors of traumatic experiences who have had involvement in multiple service sectors

Substance Abuse and Mental Health Services Administration. *SAMHSA's Concept of Trauma and Guidance for a Trauma-Informed Approach*. HHS Publication No. (SMA) 14-4884. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2014.



## Helping Traumatized Children Learn

CREATING  
Trauma-Sensitive  
Schools

ADVOCATING  
for Trauma-  
Sensitive Schools

[Traumasensitiveschools.org](http://Traumasensitiveschools.org)

September 14, 2017



# Challenges and Opportunities

- “There is an increasing focus on the impact of trauma and how service systems may help to resolve or exacerbate trauma-related issues. These systems are beginning to revisit how they conduct their business under the framework of a trauma-informed approach.”

What are the strengths, challenges and opportunities in the settings where you work?

## Achievable, Actionable Approaches –The Four “R”s

“A program, organization, or system that is trauma-informed **realizes** the widespread impact of trauma and understands potential paths for recovery; **recognizes** the signs and symptoms of trauma in clients, families, staff, and others involved with the system; and **responds** by fully integrating knowledge about trauma into policies, procedures, and practices and seeks to actively **resist re-traumatization.**”

# Taking a Trauma-Informed Approach—Key Assumptions

- Realization
  - Understanding the prevalence and impact of trauma on individuals and communities
  - Trauma-informed approaches are relevant in all social service, educational and health care settings
  - Students, families and staff may all be affected by trauma—often we do not know

“What we identify as maladaptive behaviors are really misapplied survival skills”



[thesanctuaryinstitute.org](http://thesanctuaryinstitute.org)

September 14, 2017

# Taking a Trauma-Informed Approach—Key Assumptions

- Recognition
  - Education and training for *all* staff
  - Skilled supervision
  - Trauma screening and assessment can assist and may be appropriate in certain settings
  - Students, families and staff may be living in a state of anxiety and activation, causing them to feel escalated before they even walk in your doors

# Taking a Trauma-Informed Approach—Key Assumptions

- Response
  - Involves staff at every level of organization, at every encounter, and includes support for workforce
  - Deliberate and planned, anticipates changes in local community
  - Create an environment that enables:
    - Safety
    - Trustworthiness and transparency
    - Peer Support
    - Collaboration and Mutuality
    - Empowerment, Voice and Choice
    - Respect for cultural, historical and gender issues

# Taking a Trauma-Informed Approach—Key Assumptions

- Resist re-traumatization
  - “Organizations often inadvertently create stressful or toxic environments that interfere with the recovery of clients, the well-being of staff and the fulfillment of the organizational mission”
  - Create an environment that feels safe to learn
  - Address needs in a holistic way
  - Explicitly connect students to the school community and provide opportunities to practice newly developing skills



# Staff Wellness



- Personal histories of trauma
  - May impact how staff manage day to day stresses or relate to patients and other staff
- Vicarious trauma
  - Sometimes called compassion fatigue
  - Persistent anxiety or thinking about trauma experienced by patients
  - Manifested in many ways, from “numbness” to anger

# Questions?

- Lee Savio Beers, MD
- [lbeers@childrensnational.org](mailto:lbeers@childrensnational.org)

