Trauma and the Brain: The Developmental Impact of Trauma in Childhood

CABHP 20th Annual Summer Institute

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Heads-Up—Time Challenge!

- This workshop is typically 6-hours!
- But it’s Wednesday afternoon at a conference.
- We’ll cover as much as possible in 75 minutes. And hit all the highlights!
Today’s Itinerary: Trauma and the Brain

• **WHAT** is it?
• **HOW** does the brain respond?
• **WHAT** can we do?
1. What Is It?
What is Childhood Trauma?

There are numerous definitions and descriptions...
Childhood Trauma: What Is It?

“Child traumatic stress occurs when children and adolescents are exposed to traumatic events or traumatic situations that overwhelm their ability to cope.”

National Child Traumatic Stress Network (www.nctsn.org)
1. **What has happened to you?**
   Every child/youth in the social service system should be screened for trauma history.

2. **What has NOT happened to you?**
   Our understanding of what children need to develop healthy brains is well known. What is this child not getting? How do we help adults in the community to provide what children need?

3. **What is wrong with you?**
“Unresolved posttraumatic stress in turn can lead to serious long-term consequences into adulthood (Briere, 1997), such as problems with interpersonal relationships; cognitive functioning; mental health disorders, including PTSD; substance abuse; anxiety; disordered eating; depression; self-injury; conduct problems – all of which can increase the likelihood of involvement in the justice system.”

(Ford, 2009; Friedman, Keane, & Resick, 2014; Kerig & Becker, 2014)
Take Home Messages

• No matter how defined or the specific type of trauma, traumatic experiences can have the same biological impact on the developing (and vulnerable) child brain.

• *When it comes to responding to trauma, the brain does not discriminate.*
The Most Significant Public Health Issue of Our Time

Childhood trauma may be the #1 Public Health Issue in the United States, obliterating any other issue for scope of pain, cause of early death, cost (to individuals, families, businesses, and communities), and lessened quality of life. But we can change that!
2. How Does The Brain Respond?
Get Ready...

For Fast, Fascinating AND Heartbreaking Brain Science

TranZed Institute
2. How Does The Brain Respond?

- Abuse, neglect and similar adversity in childhood are often traumatic experiences. They result in “Distress” response in the brain.
- Distress experiences (trauma) in childhood often lead to mental health conditions that may emerge in childhood, adolescence or adulthood.
- These mental health conditions result from the brain’s response to the traumatic stress.
What is a Mental Health Condition?

A mental health condition is a substantial change in the way a child feels (mood), thinks and/or behaves. Such conditions may affect the child’s ability to relate to others and function each day. Each child will have different experiences, even children with the same condition.

http://www.nami.org/Learn-More/Mental-Health-Conditions#sthash.R4nbWJdR.dpuf
Please Note...

• Post-Traumatic Stress Disorder (PTSD) is NOT the only mental health condition resulting from childhood trauma.

• Children with traumatic experiences are vulnerable to the entire range of mental health conditions.
What Are Some Mental Health Conditions That Often Occur?

The child abuse victim’s feelings of fear, anger, shame, guilt and hopelessness may be directed inward ("internalization"), resulting in symptoms of:

• **Depression** *(including Suicidal Ideation)*
• **Anxiety**
• **Post-Traumatic Stress Disorder**
What Are Some Mental Health Conditions That Often Occur?

The child abuse victim’s feelings of fear, anger, shame, guilt and hopelessness may be directed outward (externalization”) resulting in symptoms of:

• Oppositional Disorder
• Conduct Disorder

These conditions may involve Aggression, Impulsiveness, Delinquency and Addiction.
How Does the Brain Respond?

In two big ways:

1. The child’s stress response system develops an exaggerated and prolonged response to other stressors and — in severe cases — can suffer cell damage.

2. The child’s brain organs change size.
How Does the Brain Respond?

1. The child’s stress response system develops an exaggerated and prolonged response to other stressors and — in severe cases — can suffer cell damage.
3 Stages of the Stress Response
(Amygdala Driven)

Alert
Redirects Attention and Energy

Stress Response
Cortisol

Distress!
Cortisol x2 Adrenaline

Amygdala compels you to:
1. Solve the problem causing threat.
2. Escape from the problem.
3. Cope with the problem.
4. Defend yourself the best you can.
5. At any cost, survive.
Your Amygdala is Like...

The Palace Guard
(Highly attuned to Trouble; Watches; Worries; Acts When Concerned)
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Cortisol

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Danger!
3 Stages of the Stress Response (Amygdala Driven)

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Redirects Attention and Energy

Stress Response
Cortisol

Distress!
Cortisol x2 Adrenaline

DANGER!
What capacity do children have to do these things effectively?

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Redirects Attention and Energy

Stress Response
Cortisol
DANGER!

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How Does the Brain Respond?

How does traumatic stress influence the developing brain?

2. The child’s brain organs change size.
   - Smaller Corpus Callosum
   - Smaller Hippocampus
   - Larger, more active Amygdala
   - Smaller, less active Frontal Lobes
Too Much Cortisol

Excess cortisol kills cells in the hippocampus, the brain’s memory maker. Excess cortisol also shrinks the corpus callosum and the frontal lobes.
Results of Traumatic Stress

• Emotional Problems
  (Burgess et al., 1995)

• Lowers IQ, Reading Scores
  (Delaney-Black, et al. 2002)

• Memory Loss
  (Lupien, et al. 2001)

• Shortens Dendrites
  (Cook and Wellman, 2004), (Brown, et al. 2005)

• Neuron Death
  (De Bellis, et al., 2001)

• Inappropriate Attachments
  (Schore, A. 2002)
Basic Brain Chemistry:
Neurotransmitters and Hormones

• **Cortisol** – “UH-OH”
• **Adrenaline** - “YIKES!”
  vs.
• **Serotonin** – “AHH..”
• **Dopamine** – “YAHOO!”

These pairs do not play well together...
Basic Brain Chemistry
Take Home Messages

Chronic distress (excess cortisol) is the key issue to address in child trauma. Until cortisol is reduced to near normal ranges, damage to brain development is likely to continue. Safety comes first.

Children with trauma experiences are likely to experience struggles in school in almost every domain—academic, social and emotional. Be a resilience builder first, educator second!
“Once we learn to see things differently, the things we see look different.”
Take Home Messages

• The brains of our children are built for survival first and thriving second--and only if survival needs are consistently met.

• Our children’s brains have identifiable and predictable responses to traumatic experiences--allowing us to be informed and prepared!
Can We Talk?

Confirm
Insight
Wonder
3. What Can We Do?
A Road Map with 8 Stops
But First...

Lead with The Resilience Code
What is Resilience?

“The capacity of the brain to adapt successfully to significant challenges that threaten its function, viability or development.”

What the Brain Needs to Realize Resilience and Move to Thriving

In order for the brain to Build resilience and Thrive, the Amygdala first requires:

1. To be **SAFE**.
2. To be **SEEN**.
3. To be **WANTED**.
4. To be **COMPETENT**.
5. To be a **CONTRIBUTOR**.
3. What Can We Do?  
A Road Map with 8 Stops
(1) Safety Comes First

• Stop the Abuse/Trauma
  (Additional trauma is devastating. Advocate for physical and emotional safety at all times)

  • Medical Care

  • Psychological Care
  (Expand your community’s resources!)
(2) Build Self-Regulation Skills

- Body Awareness
- Emotional Awareness
  (These first two are almost always skipped!)
- Behavior Selection
- Goal: Emotional Control
(2) Build Self-Regulation Skills

• Body Awareness
  (What does stress feel like in my body?)

• Emotional Awareness
  (Acknowledge that I am stressed)

• Behavior Selection
  (When I am stressed, I can use self-talk: see next step)

• Goal: Emotional Control
Please Note!

Self-regulation must be taught before kids can effectively use stress management techniques.
(3) Teach Stress Management Skills

- Developmentally Appropriate
  - ANT Therapy
    *(Automatic Negative Thoughts)*
  - Self-Talk
  - Physical Activity
  - Mindfulness
Excellent Resources

- Fighting Invisible Tigers: A Stress Management Guide for Teens by Earl Hipp
- Stress Can Really Get on Your Nerves by Trevor Romain & Elizabeth Verdick

Elizabeth Verdick
Excellent Resources

**Sitting Still Like a Frog**
Mindfulness Exercises for Kids (and Their Parents)
Eline Snel
Foreword by Jon Kabat-Zinn

**Making It BETTER**
Activities for Children Living in a Stressful World
Second Edition
Barbara Oehlberg
Illustrated by Stephanie Roth
5 Steps to Help Kids with Stress

1. Point out the physical signs.
2. Develop a “Feelings” vocabulary/word wall.
3. Acknowledge not all stress is bad.
4. Talk about schedules.
5. Help kids connect.
Excellent Resources

Here are words to describe that stress feeling:

ALL ALONE  uptight  MOODY  TENSE  shaky  cranky
CRABBY    TIRED OUT  JITTERY  EDGY  fidgety  ready to burst
FREAKED OUT  QUEASY  ANXIOUS  frustrated  trapped
ANXIOUS  NERVOUS  burned out  RESTLESS  upset
GOOSE-BUMPY  burned out  TROUBLED  WOUNDED UP
JUMPY  PANICKY  EXCITED  mixed up
WIRED  CONFUSED  Pressured  SCARED

WORRIED  OVERWHELMED

Excellent Resources

- Fighting Invisible Tigers: A Stress Management Guide for Teens by Earl Hipp
Self-Talk Strategies
Self-Talk: ANT Therapy
ANT Therapy  
(Automatic Negative Thoughts)

2. Name the voice.
3. Think of a positive frame.
4. Move on.
ANT Therapy

1. Be aware of negative self-talk.
   ("I hate math. I never get it right.")

2. Name the voice.
   ("That’s the judge talking.")

3. Think positive.
   ("I will work hard on math today!")

4. Move on.
   (Go forward!)
Remember All the Steps!

1. Body Awareness
2. Emotional Awareness
   (These first two are almost always skipped!)
3. Behavior Selection: 
   **Coping Phrase**
Remember All the Steps!

1. **Body Awareness.**
   “*When my mouth is dry and my hands are sweating…*”

2. **Emotional Awareness**
   “…*that means I am stressed.*”

3. **Behavior Selection:**
   “*I’m going to ask Mr. Stinar for help.*”
3. Manage Stress Levels

- Vigorous **Physical Play** reduces stress (cortisol).
- The proper amount of **Sleep** is essential.
- Increase **Predictability** whenever possible.
- Remove **Threat**.
How Much Vigorous Physical Play Do Children and Youth Need?
Physical Activity is Critical to Brain Development

Exercise is essential to healthy brain development. Adolescents should engage in some physical activity at least 60 minutes a day.
Exercise is AWESOME for the Brain!

1. **Neurogenesis**: Exercise sparks the growth of new brain cells. You get a bigger brain!

2. **Connectivity**: Stimulates neurons to form dense interconnected webs that make the brain run faster and more efficiently.

3. **BDNF**: “Miracle Grow for the Brain” stimulated by exercise.

4. **Bigger Frontal Lobes**: Prediction, judgment, planning and organization are improved.

5. **Good Neurotransmitters**: Dopamine and serotonin and are elevated after exercise.
Exercise and Mental Health
(4) Repair and Strengthen the Caregiver-Child Relationship

Critical for Attachment, Trust, Safety

- Model Healthy Management of Emotion
- Demonstrate Responsiveness (Attunement)
- Emphasize Consistency in Care
- Develop Routines and Rituals
- Get Them Connected

Home Visits Can Reduce Re-abuse by 40%
(5) Enhance Executive Function Skills and Promote Enrichment
(5) Enhance Executive Function Skills and Promote Enrichment
Executive Function Skills

“Brain-based skills required for humans to execute, or perform, tasks.”

(Dawson and Guare 2009)
Executive Function Skills

“The set of abilities that allows you to *select* behavior that’s appropriate to the situation, *inhibit* inappropriate behavior, and *focus* on the task at hand despite distractions.”

*(Aamodt and Wang 2008)*
## Two Dimensions of Executive Function Skills

<table>
<thead>
<tr>
<th>COGNITION (EFS that require THINKING)</th>
<th>BEHAVIOR (EFS that require DOING)</th>
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<tbody>
<tr>
<td>“TWOMP”</td>
<td>“FESTIG”</td>
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<td>Time Management</td>
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Building Focus (Sustained Attention, GD Persistence)
What’s Different?

Spot 5 Differences on the Pirate Flags
What’s Different?

Spot 5 Differences on the Pirate Flags
What’s Different?
What’s Different?
What’s Different?
What’s Different?
FIND 5 DIFFERENCE

![Two car diagrams with differences highlighted]
Time Orientation
Creating and Sustaining Routines: Smile and Say Cheese!

- Make routine processes visual
- Students are good at creating these!
McKenzie and the Dishwasher

McKenzie's Dishwasher
Drill... Open it up, unload if necessary.

Rinse the item...
McKenzie and the Dishwasher

- “Negative Loop” around dishwasher chore.
- Oral Recipe repeatedly failed.
- Photo Book provided the “surrogate frontal lobe” she needed.
(6) Play Developmental Catch-Up

1. Encourage exploration
2. Mentor in basic skills
3. Celebrate developmental advances
4. Rehearse and extend new skills (skill building)
5. Protect from inappropriate disapproval, teasing, and punishment
6. Communicate richly and responsively
7. Guide and limit behavior
Move from Abstract to Specific Language to Improve Behavior
An Upside Down Idea

• Avoid **abstract** terms without a concrete example ("Responsibility," "Respect," "Appropriate").

• Be **specific**.

• Focus on **action**.

• If using abstract terms, always pair with a specific, concrete behavior.
Why are Abstract Terms Difficult for Young Brains?

Abstract thinking ability develops well after puberty.
The definition of the abstract term is often vague and it changes based on the context (circumstances).
A High-Impact, 3-Part Model

**Step 1:** State the context and the general behavior desired in that context.

**Step 2:** Precisely and concretely state the behavior desired—so that a first grader could do it.

**Step 3:** Connect the context and desired behavior to the abstract term.
You are leading a classroom discussion and have called on Katy for a contribution. Katy begins speaking. Two other students start having a side conversation and giggling.
An Upside Down Idea

You are leading a classroom discussion and have called on Katy for a contribution. Katy begins speaking. Two other students start having a side conversation and giggling.

• “ShShhh! Be Respectful!”
An Upside Down Idea

You are leading a classroom discussion and have called on Katy for a contribution. Katy begins speaking. Two other students start having a side conversation and giggling.

“When someone is speaking during class discussion, it is time to listen. That means eyes on the speaker, hands in lap, and mouth closed. That shows the speaker respect.”
A High-Impact, 3-Part Model

**Step 1:** State the context ("when someone is speaking…") and the general behavior desired in that context ("…it is time to listen.")

**Step 2:** Precisely and concretely state the behavior desired ("that means eyes on the speaker, hands in lap and mouth closed.")

**Step 3:** Connect the context and desired behavior to the abstract term ("That shows the speaker respect.")
You get a call to come to school. Your son, Frank, was removed from class because he disagreed with a teacher’s instruction and began yelling at the teacher. Be specific with Frank about his behavior.

- “When you disagree with a teacher….”
  Do this__________
  Say this__________

- “That shows respect for the teacher while advocating for yourself.”
(7) Focus on Building Competency

How Do You Build Self Esteem in Children?

MASTERY! (not praise)
Mastery Builds Self-Esteem

- Cooking
- Magic Tricks
- Martial Arts
- Ceramics
- Expressive Arts
- Dramatic Arts
- Music
8. Instill Hope!
How Do You Measure Hope?
Using Language to Instill Hope

1) Affirmation
2) Prediction of positive outcomes
3) Vision of personalized, compelling possibilities by a believable authority figure (parent, teacher, key other)

Using Language to Instill Hope

1) **Affirmation.** Unconditional positive regard unrelated to behavior or compliance.

“John, great to see you today. I’m happy to have you in class.”
2) **Prediction of positive outcomes.**

“You keep working hard and your love of storytelling will get you paid for telling stories. I heard about a volunteer opportunity at the Heritage Museum that would give you some practice…”
3) **Vision of personalized, compelling possibilities by a believable authority figure.** “Good storytellers like you are in great demand. I could see you working for a newspaper or a television station. You’ll have to keep up your hard work, but I believe you’ll tell stories for a career.”
Think of a Kid...

1) Affirmation
2) Prediction of positive outcomes
3) Vision of personalized, compelling possibilities by a believable authority figure (i.e., You!)
The Promise of Neurogenesis
Overturning 100 years of Dogma: Neurogenesis (birth of new brain cells)

- In 1999, new labeling tools allowed researchers at The Salk Institute to confirm the birth of newly-generated neurons.
- Subsequent studies showed that many stems survived and became functional!
Neurogenesis Has Limitations

- Neurogenesis is not “automatic.”
- Certain activities and behaviors appear to be required to stimulate and stop the neurogenesis process.
- Neurogenesis is not pervasive across all brain regions.
Neurogenesis

**Stimulated by:**
- Vigorous Physical Play
- Meaningful New Learning
- Exposure to Enriched Environments/Experiences
- Managed Stress Levels
- Positive Nutrition
Neurogenesis

Stopped by:

• Distress
• Physical Inactivity
  • Boredom
  • Depression
• Poor Nutrition
Neurogenesis is Your Goal!

1. Vigorous Physical Play (Regular Physical Activity)
2. Meaningful New Learning
3. Enriched Experiences
4. Managed Stress Levels
5. Positive Nutrition
6. Social Support
7. Sufficient Time

Action Plan

- Stop!
- Consider
- Start
If you benefited from today’s presentation, please tell someone!

We provide more than a dozen stimulating, cutting-edge workshops designed to help transform child and youth care practice.

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