The Neurobiology of Stress & Trauma: Implications for Education & Treatment

Dr. Reggie Melrose
The SINGLE MOST IMPORTANT capacity for ALL of learning and adaptive behavior

The INTERNAL balance between excitation and relaxation

Promotes the OPTIMAL ZONE of AROUSAL necessary for achievement

Missing in our most challenging students

Mediated by both the ANS & CNS
Two branches of the ANS:

- **Sympathetic** – excitation (fight/flight) – all we have at birth
- **Parasympathetic** – relaxation – develops after birth

**AUTONOMIC DEREGULATION** is what distinguishes our more challenging students from those who are not.
The Triune Brain

(1) Brain Stem

(2) Mid-Brain

(3) Neocortex
The Triune Brain:

* Brain stem/reptilian brain – sensations
* Limbic/mid-brain – AMYGDALA – emotions
* Neocortex – words

Self-regulation impaired when the brain stem and limbic system become “stuck on high” and when the neocortex shuts down...

...DUE TO STRESS or TRAUMA.
- Neocortex
- Mid-Brain
- Brain Stem
At birth, we have only the brain stem

From 0-3 and FAR beyond, the limbic brain and neocortex develop

The brain develops in a USE-DEPENDENT and HEIRARCHICAL fashion: the healthy development of the neocortex depends upon the healthy development of first, the brain stem and then, the limbic brain
Three primary purposes of the brain:

* Survival
* Procreation (for survival)
* Caring for dependents (for survival)

Many of our students are focused solely on survival to the detriment of their education.
A REAL or PERCEIVED threat of danger

No way to objectively judge what is stressful or traumatic for another person

May be medical and/or psychological

Always physiological

Has direct, specific, observable, and measurable impact on the CNS and ANS
Stress Brain  Resilient Brain

Neuroplasticity
The Vagus Nerve
Self-Regulation / The Zone (4,5,6,7)

Sympathetic

Parasympathetic

Shut down
Two different patterns of responding emerge (one, the other, or both):

- Overarousal – hyper-vigilance (only looks like ADHD)
- Underarousal – shut down; numb (only looks like depression)
Hyperarousal

Optimum Arousal Zone

Freezing/Numbing

(Ogden & Minton, 2000)
Non-Linear relationship between stress and anxiety (they wake up stressed!)

Elevated baseline level of anxiety

Due to “kindling effect” of AMYGDALA

Behavioral outcomes include anger, aggression, bullying, depression, hyperactivity, mood swings, cutting, substance abuse, promiscuity, anorexia/bulimia, disengagement (in all forms!) and more.
When AROUSAL is too high:

- Hippocampal damage - memory deficits
- Deficits in attention, recall, and comprehension
- Poor problem-solving
- Misidentified as learning disabled
INCREASE SELF-REGULATION through:

● 60 Seconds... into the “Zone of Optimum Arousal”

● Resources (“Scales of Justice”)
  - External & Internal
  - Intervene w/ explicit teaching, and by creating opportunities and access
1. Feel your feet on the ground.
2. Take in the support of your chair.
3. Breathe in through your nose.
4. Visualize yourself in a safe, beautiful place in nature.
5. Notice what is happening inside your body.
6. Focus only on the pleasant, comfortable sensations that arise.
7. If thoughts or unpleasant sensations enter into your awareness, simply go back to the beginning of the exercise and do the steps again, as many times as need be.
Behavioral Improvement with 60 Seconds

Mild - Moderate

Before: 46
After: 6

Severe

Before: 3
After: 3
Achievement Gains with 60 Seconds

- **Reading & Writing**
  - 60 Seconds: 80%
  - Control: 68%

- **Math**
  - 60 Seconds: 100%
  - Control: 82%

Second Grade General Education Students
Achievement Gains with 60 Seconds

% of Students Proficient or Advanced Proficient

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<th>Reading &amp; Writing</th>
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<td>60 Seconds</td>
<td>84</td>
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<td>Control</td>
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Fourth Grade General Education Students
“We only do well when we feel good.”

How do we “feel good” in spite of...?
When The Brain Does Not Adequately Feel The Body: Links Between Low Resilience And Interoception

Haase et al.

“A central goal of recovery from stress is to maintain homeostasis of critical bodily functions... The brain needs to be able to sense the state of the body to effectively engage in actions that can reduce imbalances and thus better regulate homeostasis.”
Sensory Awareness – Self-management for learning & behavior, i.e. Lindamood-Bell; OT/ “Engine”; time-IN; empathy

Safety – through RELATIONSHIP FIRST, then structure (rules, routine, rituals), order, predictability, i.e. IF-THEN charts, schedule on desk, review, DRO

Community – schools can provide ground, center, connection, belongingness, purpose, and chances to repair – ELIMINATES SHAME, i.e. the “chocolate cake study,” “The Beyond Consequences Classroom,” “Discipline with Dignity”

Competence – opportunities to succeed/ experience mastery, i.e. math
What Does NOT Work

* Anger management (increases SHAME)
* Reasoning/talking (even talk therapy!)
* Power struggles
* Using resources as a reward
* Time-out
* Loss of points/privileges
* Punching a pillow
* Problem-focused consultations
What Works

* A relatively quiet safe place ("Keeping our cool...")
* Compassion replacing shaming
* Community and belonging
* Earning/keeping rewards
* Time-away/Time-in
* Few words
* Chances to start over/repair
What Works (cont’d)

* Positive acknowledgment (“Focusing on the good...”)
* Success and competency
* Building resources (external, internal)
* Positive communication with parents
* Prevention through psychoeducation
* Early intervention (Pre-K, K, 1)
* Solution-focused consultations
More “Non-specific” Ideas to Reduce Stress

- Large picture of nature in the room (vs. problem on the board)
- Theme song/music for transitions
- Choice for sense of control, i.e. self-soothing/ RBT
- Mirroring statements EXACTLY
- Organization (order), i.e. desk clean-outs
- Extra response time for “ODD”
Dr. Reggie’s Books

**Why Students Underachieve** (2006) $29-
Audio Edition Available

**You Can Heal Your Child** (2009) $15-
Audio Edition Available

**The 60 Seconds Fix** (2013) $15-
AMAZON Best Seller - Audio Edition Available

**Hope & Healing: Activities Book** (2009) $15-

**Hope & Healing: Parent Guide** (2009) $5-
(ENG/SP)

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