The Biology of Trauma

Using Bodies and Brains to Help Kids Heal

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"Even more than IQ, your emotional awareness and ability to handle feelings will determine your success and happiness in all walks of life."

John Gottman

The brain is divided into two parts:

- The limbic system or “emotional brain”
- The neo-cortex or “thinking brain”

The Emotional Brain

- Stress starts in the **limbic system**.

  The limbic systems sees, hears, or—and this is important—*thinks* about danger and tells the sympathetic nervous system to get ready to run or fight.

Fight-or-Flight Response

- The **sympathetic nervous system** sends out its all-points-bulletin and **epinephrine** lends a hand. You are now sweating, panting, wide-eyed, and ready to *move*. Depending on the situation, you may run like crazy or you may use all your strength to physically prevail.

Fight-or-Flight Response

- When your limbic system senses the danger is over, it tells your **parasympathetic nervous system** to calm you down. Your breathing evens out, your heart rate returns to normal, and your dry mouth fades. Of course, this takes a little while because you still have epinephrine coursing through your veins but once it's been dispersed, you're back to our old self.

Fight-or-Flight Response

- So why is it important to know that your fight-or-flight response can be activated when no danger is actually present, that the mere act of *thinking* about danger can trigger your fight-or-flight response?

Fight-or-Flight Response

- The body doesn't really know the difference between a physical threat or emotional fear, stress, and anxiety
- Both mobilize the deep defenses associated with a trauma response—fight, flight or freeze
- When the emotional brain perceives something upsetting, the same response occurs whether it's a car accident or an argument

Fight-or-Flight Response

- When the emotional brain sounds the alarm, it puts the thinking brain off-line. You go immediately from stimulus to response without taking the time to gather additional information.

- This is OK when you're heading off an actual car accident and you need your body to come through for you, but it's a big problem when the danger only exists in your mind.

Fight-or-Flight Response

- When that happens, you need to take the time to assess the meaning of what's going on but you can't, your brain can't physically do it. This means that you overreact or behave irrationally in response to minor provocations.

- It is this mechanism that makes you feel crazy or makes others question your judgment

An Experiment

Audience participation appreciated!

The Thinking Brain

- The neo-cortex is responsible for our "executive function"
- The term executive function describes a set of cognitive abilities that control and regulate other abilities and behaviors.
- Executive functions are necessary for goal-directed behavior.

The Thinking Brain

- They include the ability to initiate and stop actions, to monitor and change behavior as needed, and to plan future behavior when faced with novel tasks and situations.
- Executive functions allow us to anticipate outcomes and adapt to changing situations.

What does this mean for kids?

- When kids are in an activated state, they cannot access their executive functions
- Their problem-solving abilities are not available to them

What does this look like in kids?

- Problems with self-regulation—intense fear, anxiety, anger and panic in response to even minor stimuli
- Emotional numbing—may look like disconnection or lack of motivation

What does this look like in kids?

- Learned helplessness—overwhelmed by the feeling that they can do nothing to change their situation
- Hypervigilance—always scanning the environment and relationships for signs of danger, results in chronic low level of anxiety
- Hyperreactivity—condition in which a person over-responds to stress, particularly if they are feeling vulnerable

What does this look like in kids?

- Depression
- Learning difficulties—physiological hyperarousal interferes with the capacity to concentrate and learn from current experiences or teaching

What does this look like in kids?

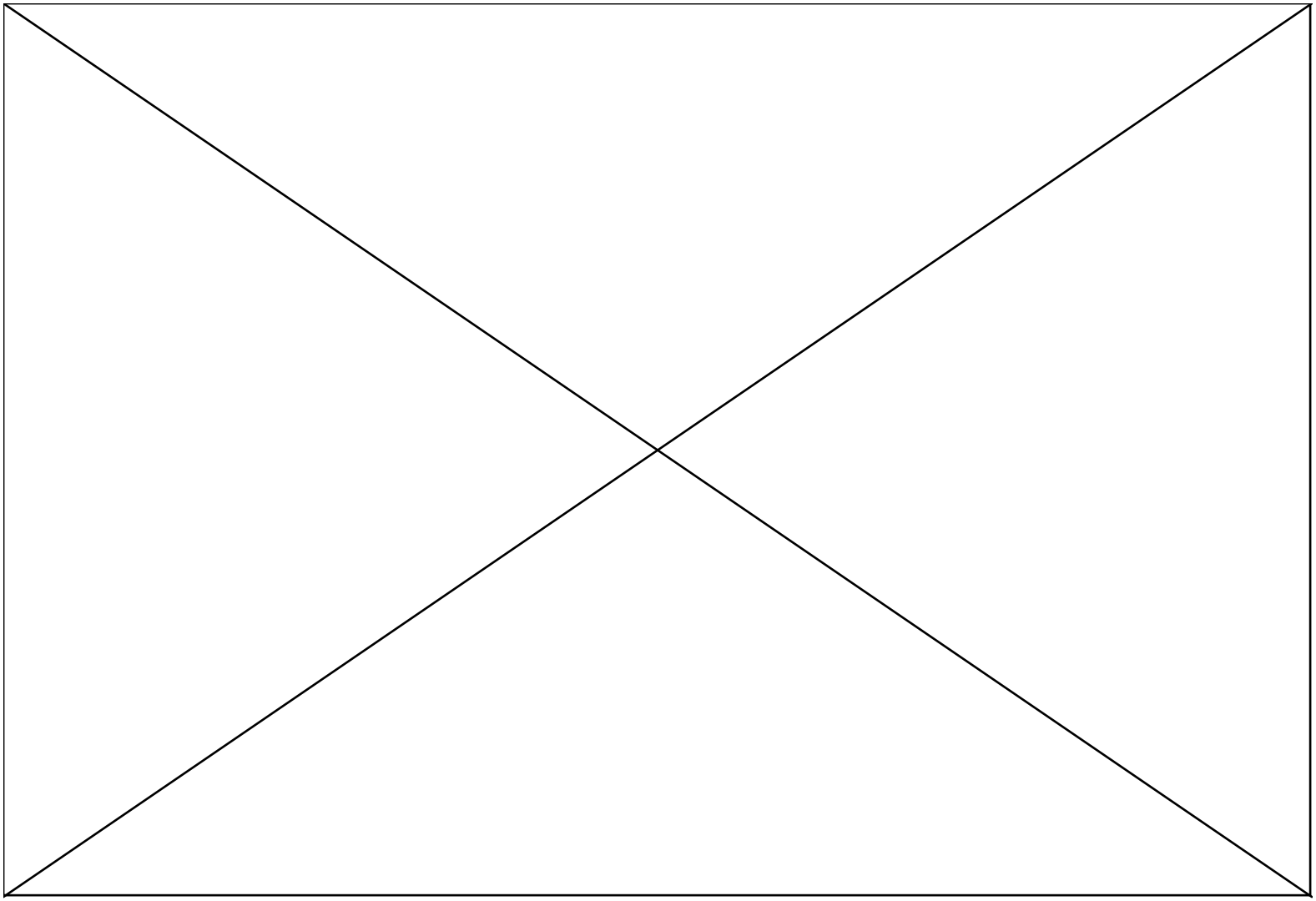
- Distorted reasoning– rationalizing and justifying bizarre or unusual forms of behavior and relations
- Aggression
- Loss of ability to receive caring and support from others

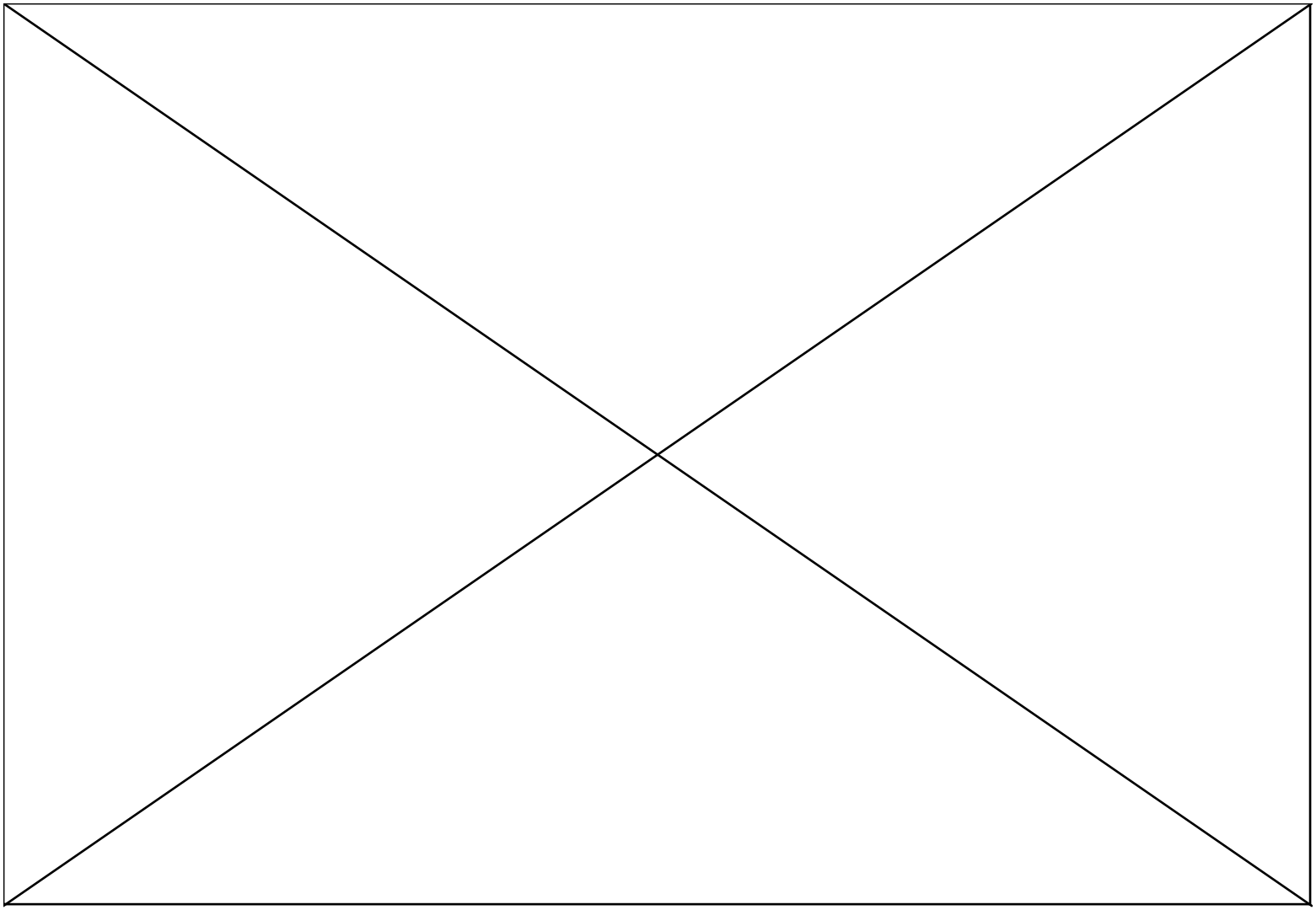
What does this look like in kids?

- High-risk behaviors—desire to alter mood and stimulate a rush of feel-good chemicals
- Memory disturbances—any arousing situation may trigger memories of traumatic experiences and result in responses that are irrelevant to the present situation

What does this look like in kids?

- Somatic disturbances—back pain, chronic headaches, muscle tightness or stiffness, stomach problems, heart pounding, headaches, shivering and shaking





Talk doesn't cook rice.

Chinese proverb

Talk Doesn't Cook Rice

- We generally think we can talk our way out of emotional problems
- We need to remember that emotions are the result of chemical reactions in our bodies—a biological process

Talk Doesn't Cook Rice

- Healing kids requires that we take both their brains and bodies into consideration
- We want to increase their stress threshold—the amount of stress they can tolerate before they exhibit symptoms
- The threshold is dependent on their mental, emotional, and physical state

Some examples…

A Three Pronged Approach

- Nutrition
- Exercise
- Stress management/cognitive behavioral therapy

A Three Pronged Approach

- **Poor nutrition**: the body suffers and the mind deteriorates
- **No exercise**: the body deteriorates and the stress builds up
- **Chronic stress**: poor immune response and health problems

Nutrition and Behavior

- The role of sugar: the rush and the crash
- Seven warning signs of hypoglycemia:
  - Fatigue
  - Irritability
  - Hunger, even though you recently ate
  - Mental slowness
  - Forgetfulness
  - Inability to concentrate
  - Lethargy

Nutrition and Behavior

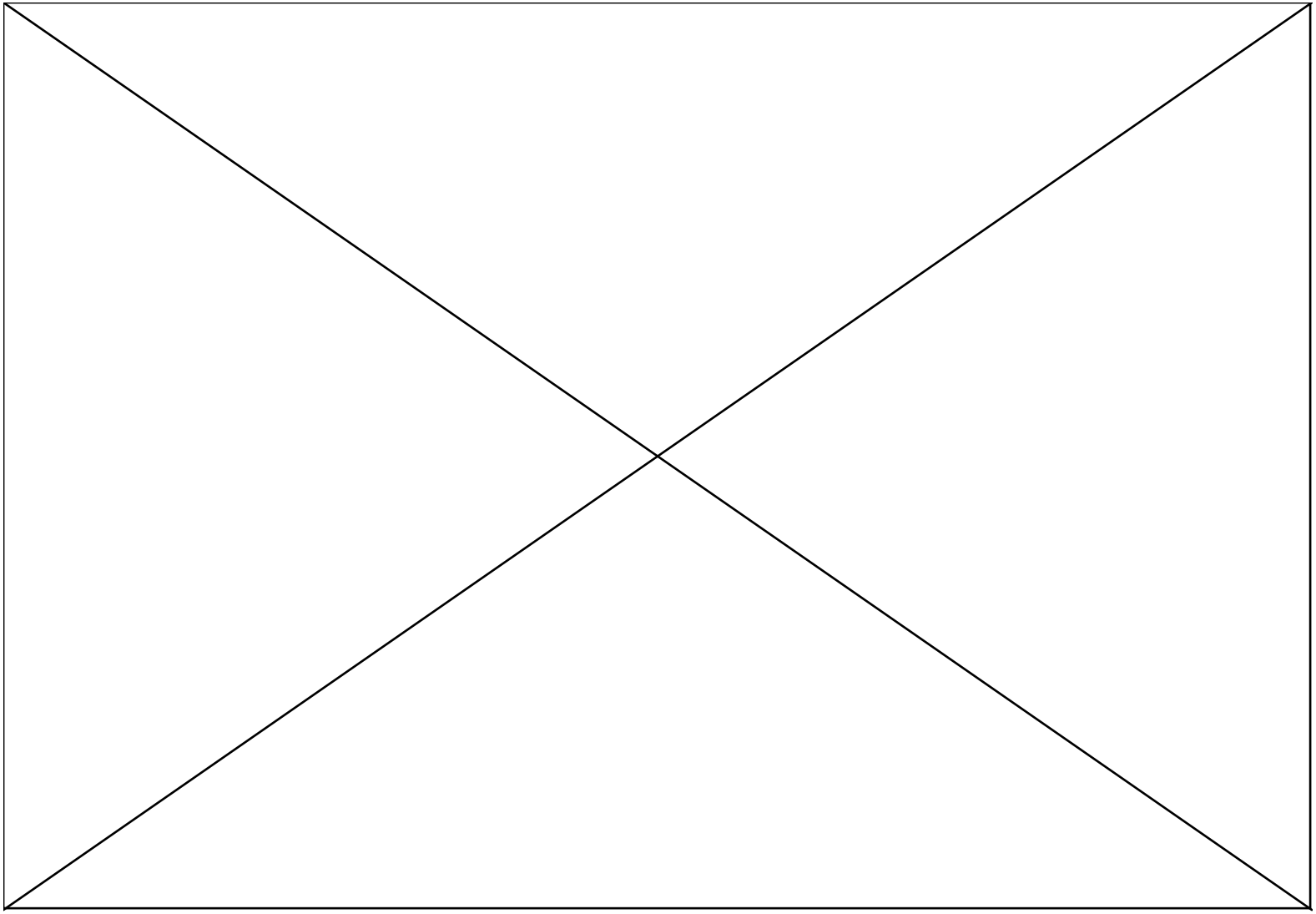
- This also occurs when we go skip meals or go too long between them
- Even mild dehydration can increase anxiety
- Caffeine makes kids feel nervous and jittery and interferes with sleep

Guidelines

- Eat complex carbohydrates
  - Whole grain breads and cereals
  - Vegetables
  - Oats, lentils, wild or brown rice
  - Peas, beans, potatoes
  - Sweet potatoes
  - Soybeans or tofu

Guidelines

- Eat frequent small meals during the day
- Include some foods that contain tryptophan (milk, bananas, soy, poultry, cheese, nuts, peanut butter, sesame seeds)
- These are all strategies to increase serotonin, a feel-good chemical that has a calming effect



Guidelines

- Four reasons for kids to exercise:
  - Health
  - Behavior
  - Sleep
  - Reducing trauma symptoms

"It was pretty obvious that as long as people just sat and moved their tongues around, there wasn't enough real change."

Bessel van der Kolk, M.D.

Guidelines

- Walking and talking
- Don’t take recess away
- Consider active chores when disciplining
- Organized sports and lessons

Stress Management

- The goal is for the limbic system and neo-cortex to work together, to create equilibrium
- This allows us to govern our emotions, deal with frustration and cooperate with others

Stress Management

- Ways to quickly calm down
  - Stop, close your eyes, and take 10 slow deep breaths
  - Dance
  - Sing a song
  - Take a warm bath
  - Listen to your favorite music

Stress Management

- Ways to quickly calm down
  - Write in your journal
  - Listen to, watch or read something funny
  - Run in place for 5 minutes
  - Take a walk outside
  - Go ride your bike
  - Do something to help someone else

"Breathe deeply and gently through every cell of the body, laugh happily, and release the head of all worries and anxieties; and finally, breathe in the blessing of love, hope, and immortality that is flowing in the air, and you will understand the meaning of human breath."

Pundit Acharya