The Neurobiology of Trauma

Presented by:

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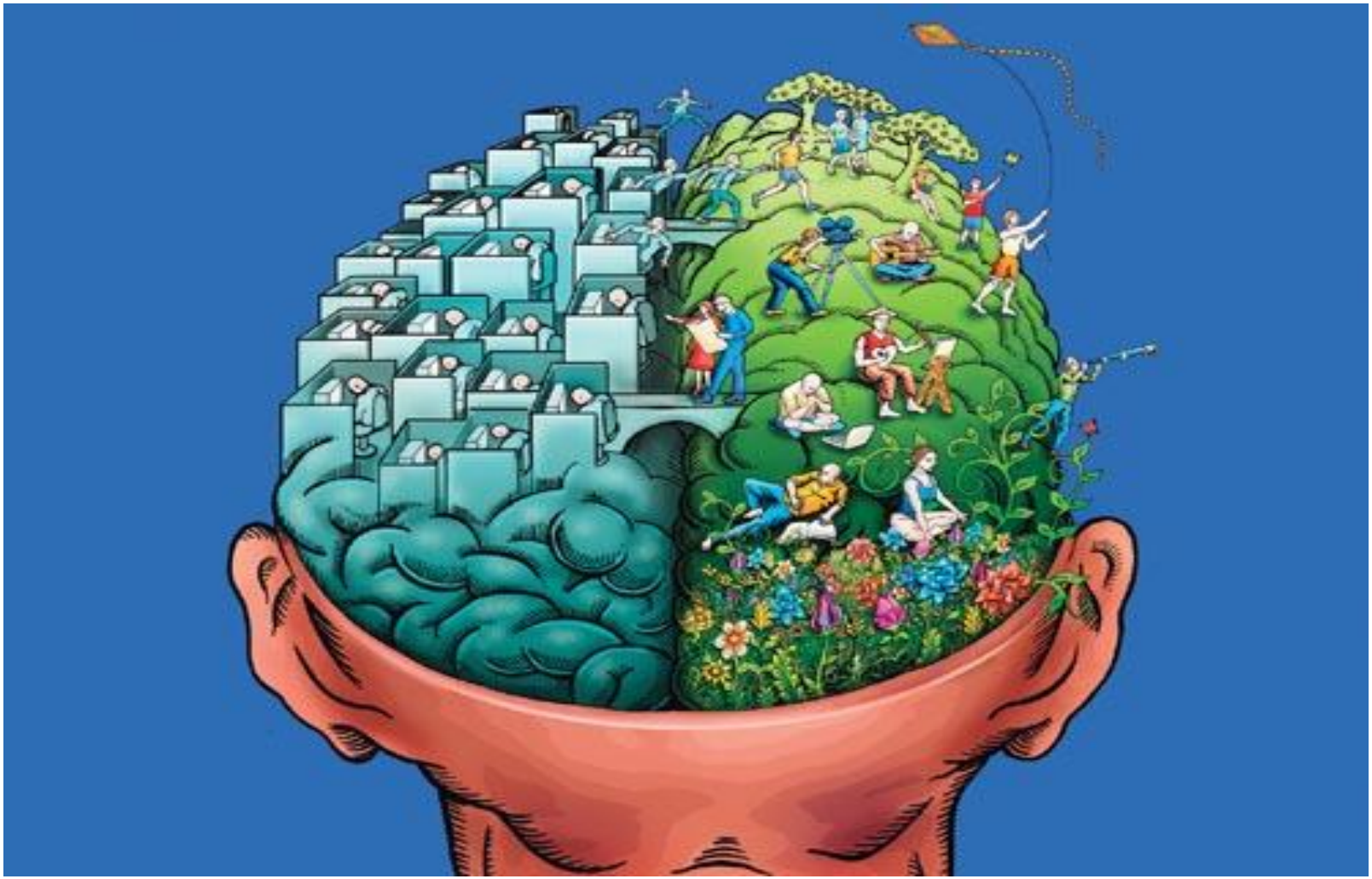
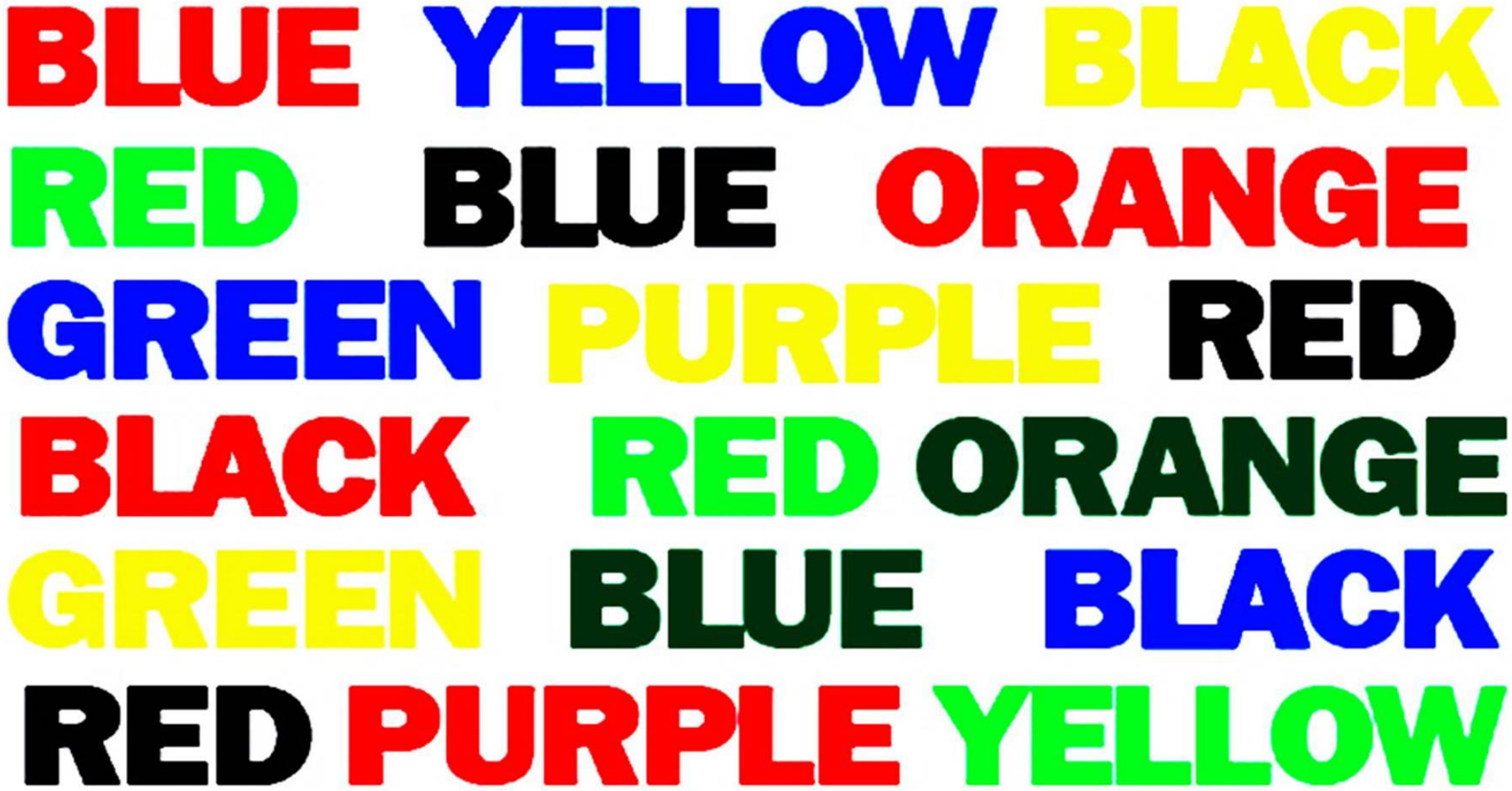
Magellan of Virginia, VP/General Manager

Impact to Right and Left Hemisphere Talk



Left Right Brain Conflict

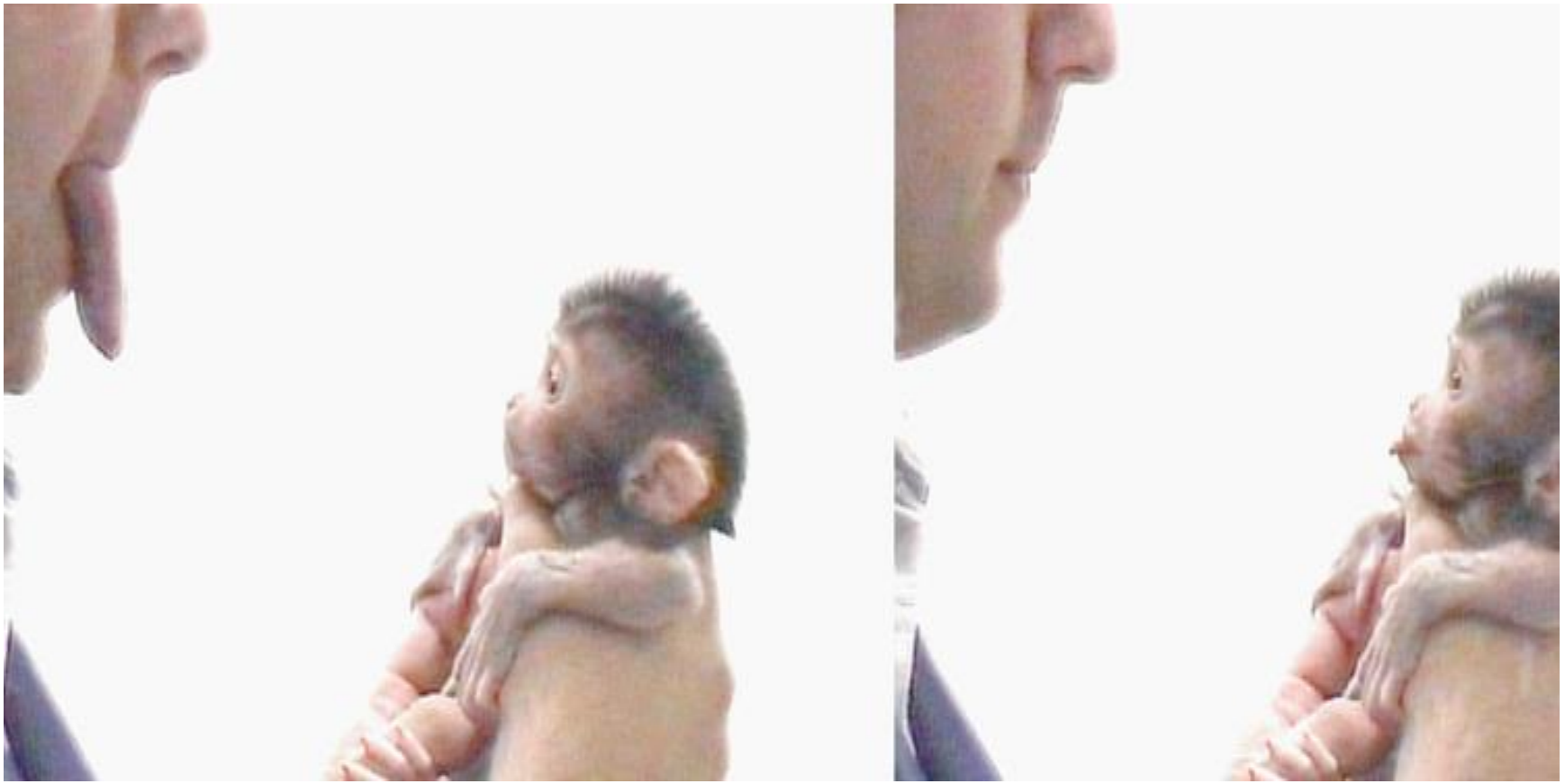


Self-Care Alert!

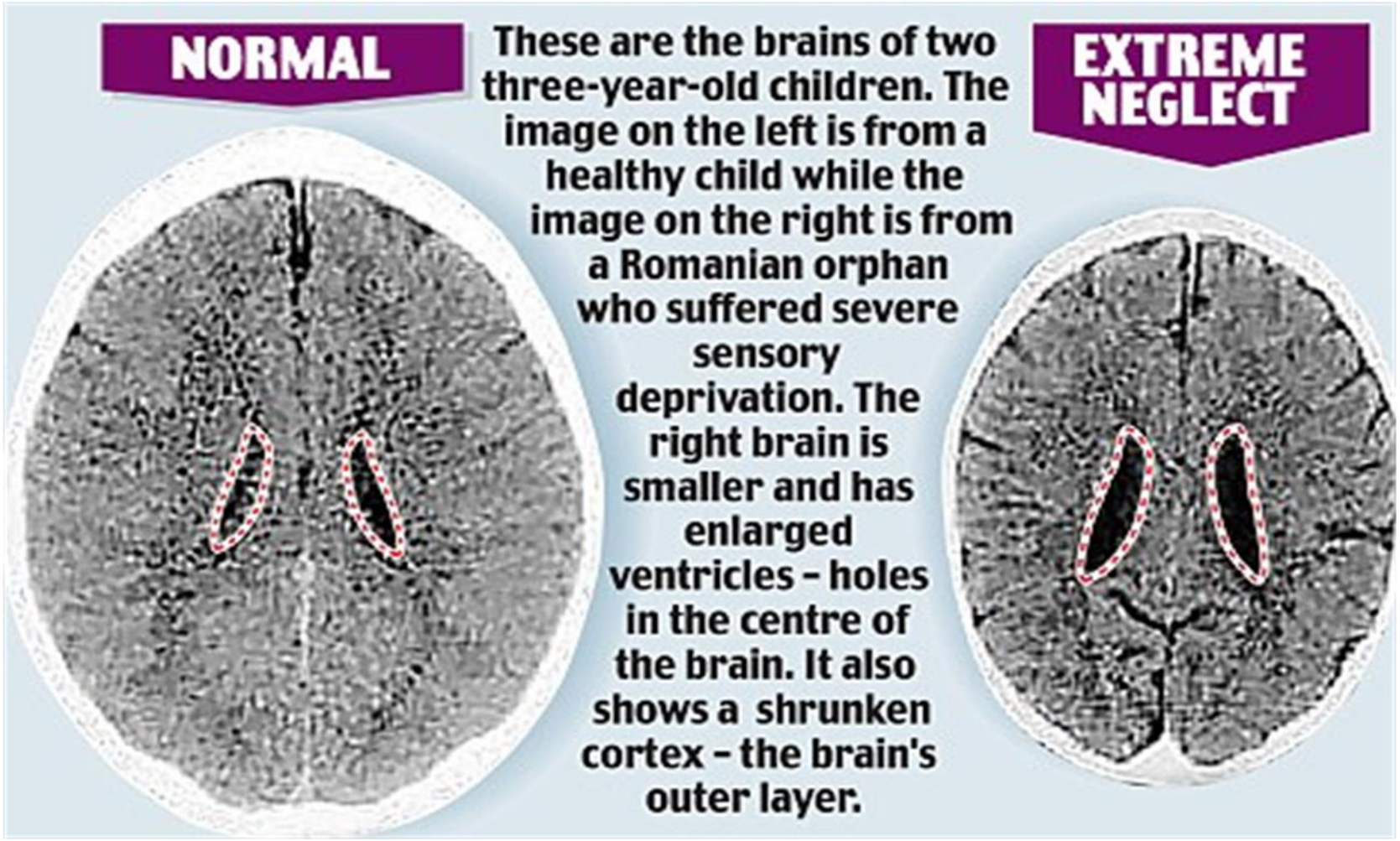
- Step out and take a break
- Talk to someone you trust
- Do something relaxing

Trauma's Impact on the Brain

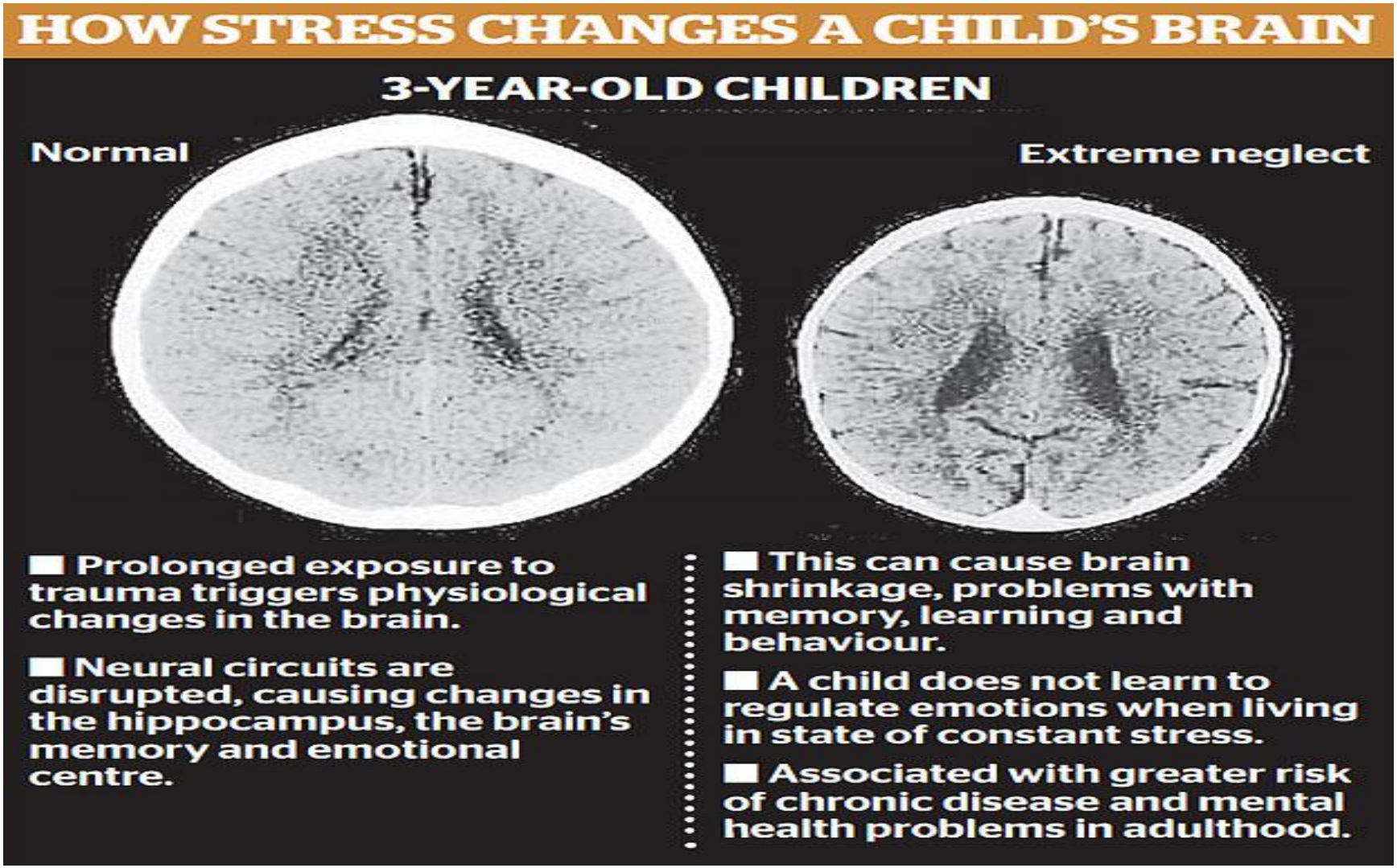
Brains Mirroring Social Experience



Severe Trauma's Impact to the Brain



How Stress Changes the Brain

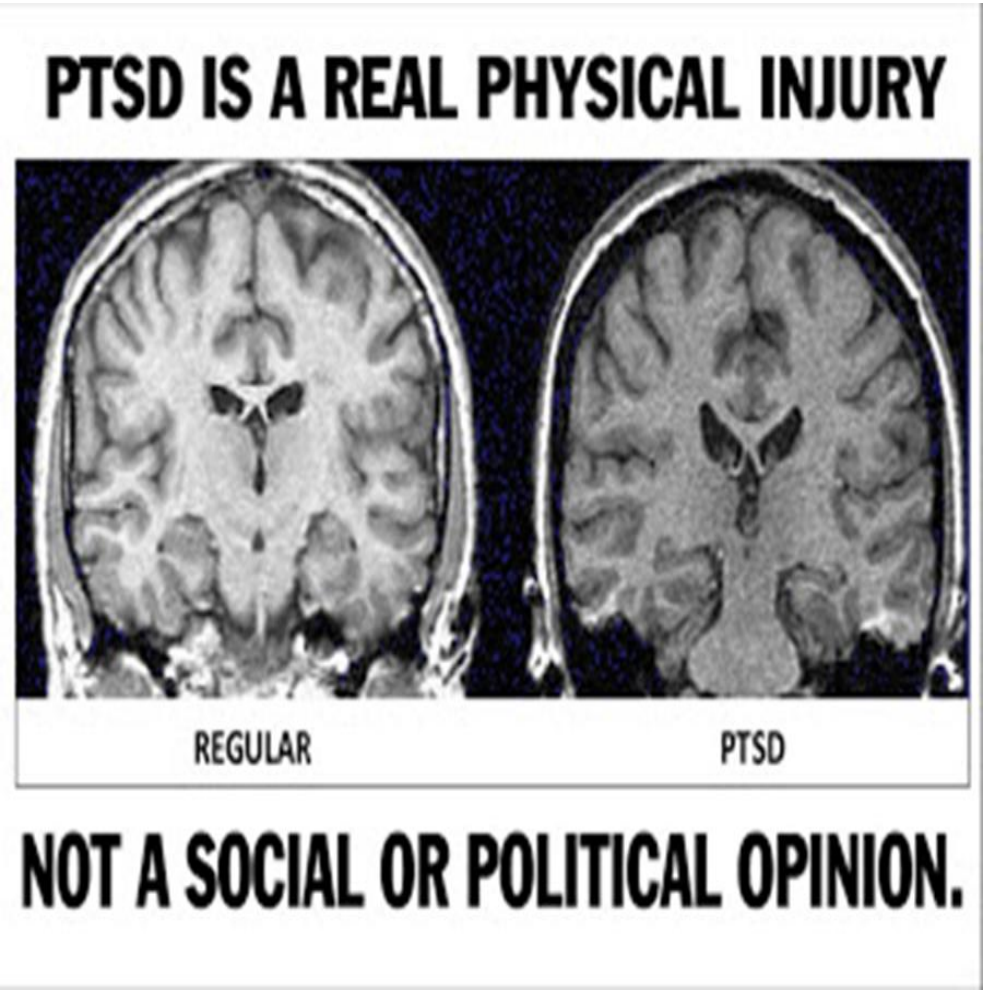


PTSD

Recent studies have shown that victims of childhood abuse and combat veterans actually experience physical changes to the hippocampus, a part of brain involved in learning and memory, as well as in handling of stress.

Hippocampus works closely with medial prefrontal cortex, area of brain that regulates our emotional response to fear and stress.

Neuroscience is changing the direction of mental health services. Psychotherapy is no longer a "soft science." This brain scan shows the changes in the brain of person suffering from PTSD.



Dr. Dan Siegel's "Handy Model"

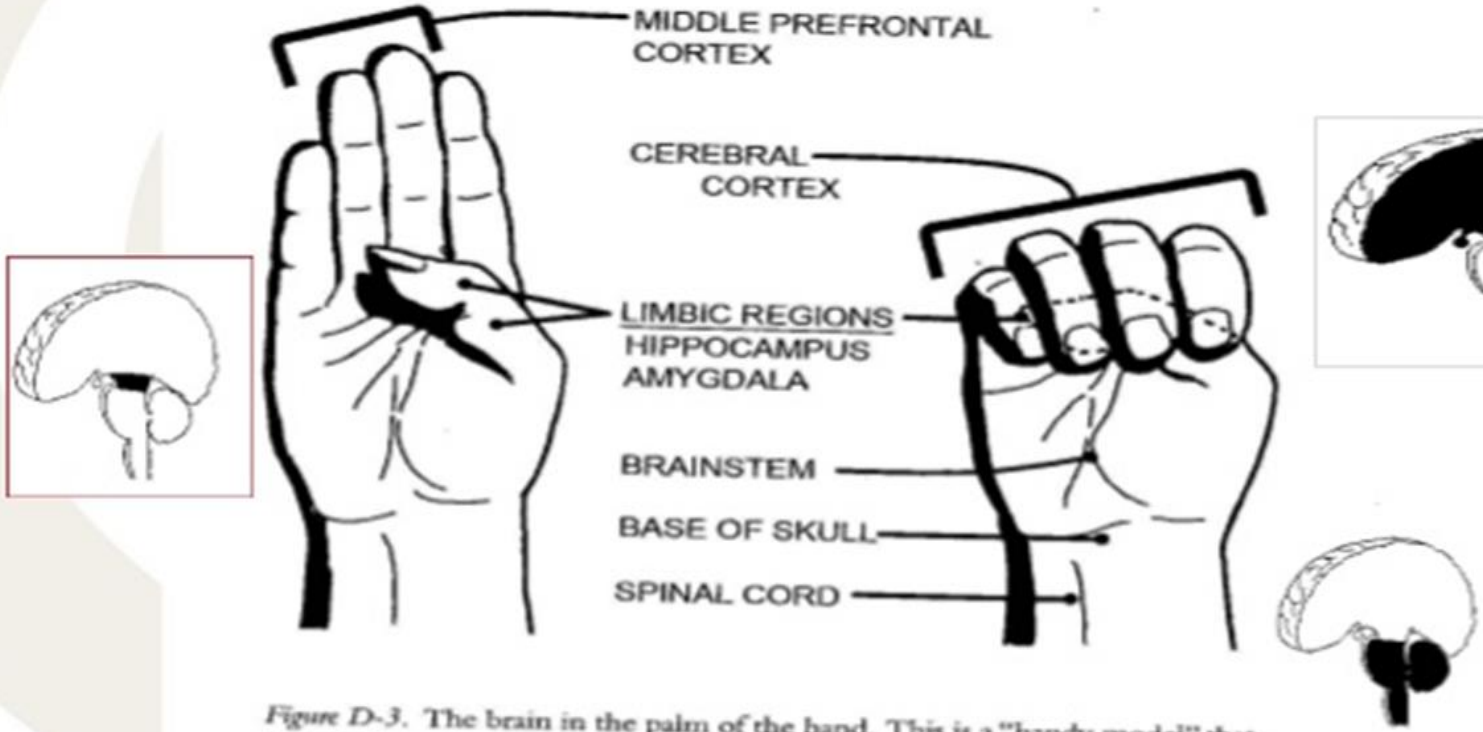


Figure D-3. The brain in the palm of the hand. This is a "handy model" that depicts the major regions of the brain: cerebral cortex in the fingers, limbic area in the thumb, and brainstem in the palm. The spinal cord is represented in the wrist. Please see text for explanation. Copyright © 2012 by Mind Your Brain, Inc. Used with permission by Daniel J. Siegel, M.D., from *The Developing Mind: How Relationships and the Brain Interact to Shape Who We Are* (2012).

Therapy and Biological Intervention

In order to fully address the needs of adults, families and youth we must:

- Support brain in working optimally
- Increase healthy coping
- Increase affect regulation
- Support individuals in making needed structural changes to enhance fit with person and environment

Brain Work

- All effective therapies require and promote affect regulation.
- Individuals with problems with antisocial behaviors have problems with affect regulation.
- This affect regulation may stem largely from traumatic experiences which impact regulation of the brain and the person and environment fit.

Needed Clinical Services

Enhance Biological Functioning

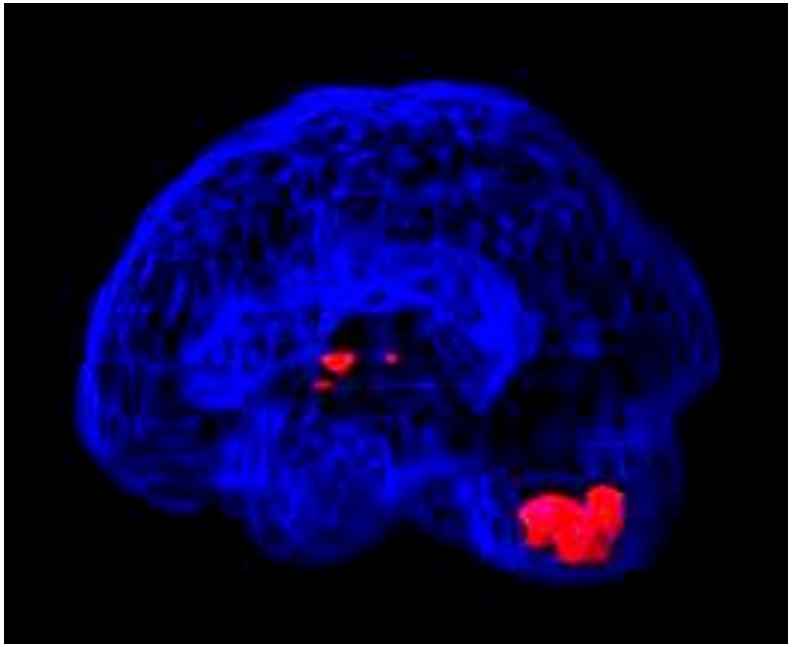
- SPECT Scan
- Neurofeedback
- Biofeedback
- EMDR

Technology

Technology allows us now to be able to observe this changing function and use it to help our clients

SPECT Scans

Single
Photon
Emission
Computerized
Technology



SPECT studies: Imaging the Brain

Parker, C. (2004)

- Looks at brain blood flow and activity
- Based on over 13 years, over 24,000 studies
- Looks at areas of the brain that:
  - Work well
  - Do not work hard enough
  - Work too hard
- Phenotypic: DSM IV
- Genotypic: SPECT
- Endophenotypic: Between the Two

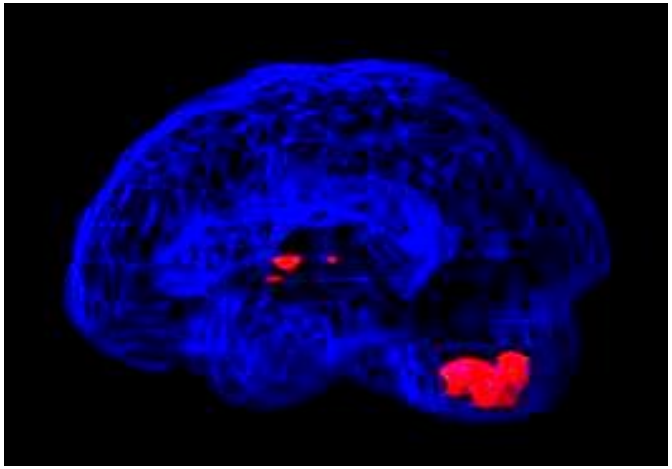
(JAMA 8/25/04)

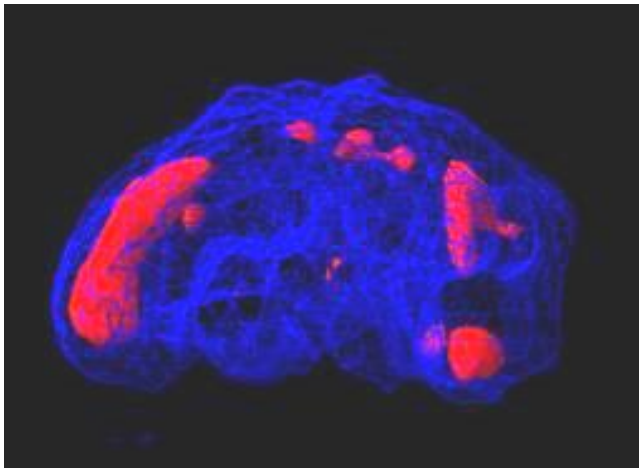
SPECT Scan: Clinical Implications

- Reduces demonizing parents of difficult youth
- Supports parents seeing child's difficult behavior as being brain related versus motivationally related
- Elicits compassion
- Provides a clear assessment of the source of acting out behavior
- Provides insight into how environment has to change in order for the brain to restructure itself

Aggression: Changes in where Energy is Focused

Top 15% of Brain Activity





Neurofeedback

Neurofeedback is a form of operant conditioning that rewards the brain for being in desirable frequencies and discourages activity at other frequencies

Neurofeedback: Clinical Implications

Neurofeedback exercises and helps “strengthen" the brain, calms it and improves its stability

It is the single best tool available for affect regulation

(Fisher, 2004)

The Process of Learning

EEG biofeedback training is a process of:

Monitoring brainwave function

Giving immediate feedback to the brain

Allowing the brain to learn instantly

The brain then:

Responds rapidly to needed changes rewarded by the feedback presented

Controls the lowers or raises its individual brain waves (frequency or amplitude)

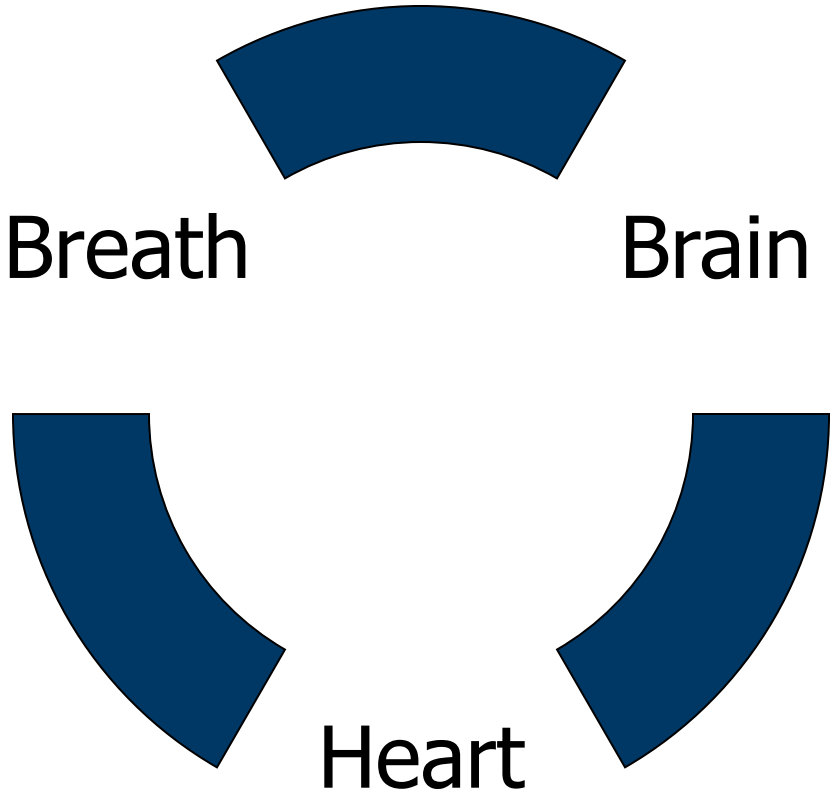
Normalizes the brainwaves

Achieves greater flexibility and facility in various frequencies and amplitudes

Biological Enhancement

Besides direct ways of observing or providing feedback to the brain, there are other feedback techniques that can enhance overall self-regulation.

Biofeedback



Self Regulation and Biofeedback

- Focusing on identifying physiologic states
- Body reconnection and empowerment
- Teach skill and encourage/secure that it will be used daily

Biofeedback: Clinical Implications

- Vehicle for awakening “person” to the inner world
- Enhances belief in mind/body connection
- Supports exercising self-talk abilities
- Increases internal coping mechanisms
- Increases Heart Rate Variability
- Breath, Heart, Mind Connection
- Decreases stress
- Increases immune system functioning
- Increases self capability of self-governance

Heart Rate Variability (HRV)

- Natural rise and fall of the heart rate in response to breathing, blood pressure, hormones and emotions
- Greater variance in the heart rate, greater health
- Stress decreases HRV
- Accurate measure of heart beat record can tell us a lot about autonomic activity
- Link to Autonomic Nervous System (ANS)
- Need to regulate self
- “Put on brakes or hit the gas”
- Sympathetic nervous system is accelerator
- Parasympathetic is brake
- Caregiver teaches us this modulation early in life

Heart Rate Variability (HRV)

- Can help us look at what is happening to ourselves in session
- Can help client's look at what is happening to their bodies in session
  - Examples: Biofeedback monitors, games, cards, Bio-Q rings

EMDR - Eye Movement Desensitization and Reprocessing

EMDR is an accelerated form of information processing healthy integration of traumatic memories using an 8 phase approach developed by Dr. Francine Shapiro.

EMDR is thought to use bilateral stimulation (i.e. eye movements, taps, or auditory cues) to activate the right and left hemispheres of the brain to promote neural integration of memory, emotions, physical sensations and perception

According to Dr. Dan Siegal, the result of promoting neural integration would be both the result of the alleviation of symptoms and development of an enhanced sense of well being internally as well as more rewarding experiences interpersonally

What about other ways of helping the brain?

- Diet
- Exercise
- Sleep
- Increasing utilization of cortex
- Ability to train the brain to move into a different pattern
- Attunement exercises

Attunement Exercises

Accomplishing co-regulatory tasks

- Pulling each other to standing position
- Hula Hoop Race
- Three-Legged Races

Therapeutic Relationship

- Assessment Process allows for the gathering of this information
- Begins the therapeutic relationship
- The therapeutic relationship is the secure base from which the client can begin to explore his cycle

Bowlby's Suggestions

- A secure base from which the client can explore his/her real life experiences.
- An opportunity to bring attention to the client's childhood experiences with his/her caregivers.
- An opportunity to explore the meaning of separations and reunions to the client both within the context of in his/her childhood as well as in the present client/therapist relationship.
- Bowlby suggests that the therapist, through a genuine relationship with the client, support the client in uncovering his internal working models of self, others and the world and then challenge the accuracy of these models given the current relationships in which he/she is engaging.

Therapeutic Relationship Development

- Directness
- Honesty
- Reflection of how client impacts you or others
- Reference back to thinking errors
- Reference back to internal working models
- Therapeutic Relationship as a corrective experience

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