



Making the EMDR Connection:

An Overview, Explanation, and Application of this Transformative
Therapy with Traumatized Children

Amy Fuller, PhD, LPC, LMFT, Certified EMDR Therapist



What is EMDR?

- Eye Movement
Desentization
& Reprocessing
- Developed by Dr. Francine
Shapiro in 1989

Dr. Shapiro is a Senior Research Fellow at the Mental Research Institute, Palo Alto, California, Executive Director of the EMDR Institute in Watsonville, CA, and founder and President Emeritus of the [EMDR Humanitarian Assistance Programs](#), a non-profit organization that coordinates disaster response and low fee trainings worldwide.



Current state of EMDR

- Currently, EMDR is rated in the highest category of effectiveness and research support in treatment guidelines for PTSD by the following:



AMERICAN PSYCHIATRIC ASSOCIATION

Member Driven. Science Based. Patient Focused.

UNITED STATES

DEPARTMENT OF VETERANS AFFAIRS



- Its efficacy is recognized in many international guidelines, where it is a recommended intervention for the treatment of PTSD (e.g., Bleich, Kotler, Kutz, & Shalev, 2002; Dutch National Steering Committee, 2003; National Institute for Clinical Excellence, 2005).

AIP Model

- Shapiro (2001) developed the AIP model to explain the mechanisms by which EMDR assists clients in moving disturbance to adaptive resolution.
- EMDR is a comprehensive treatment methodology, while AIP is the comprehensive theoretical approach to psychotherapy.
- In the AIP model, Shapiro theorized that the human organism is hard-wired to assimilate new information and to move to adaptive resolution when presented with experiences causing high arousal.
- In the event that the level of arousal is overwhelming and traumatic to the individual, the AIP progression is thwarted, and healthy processing does not continue.

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AIP Model

- The AIP or Adaptive Information Processing model (Shapiro, 2001) concludes that emotional, behavioral, and mental health symptoms originate from the maladaptive storage of previous life events.
 - In the future, as those stored experiences are activated, the client experiences disturbances and dysfunction in his or her current life manifested in symptomology.
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EMDR with children

- Although we need more research on EMDR with children, current findings support its effectiveness with children and adolescents.
 - Jaberghaderi, et al. (2002) revealed EMDR to be significantly more efficient, with large effect sizes on each outcome, in their analysis of 14 randomly assigned Iranian girls ages 12-13 who had been sexually abused after they had received up to 12 sessions of CBT or EMDR treatment.
 - Puffer, Greenwald, & Elrod (1998) treated 20 children and adolescents having only one traumatic experience with one session of EMDR. 50% percent of the students moved from Clinical to Normal levels as measured by the Impact of Events Scale.

EMDR research with children

- Chemtob, Nakashima, Hamada and Carlson (2002) studied the effects of **Hurricane Iniki** on **32 children** with PTSD symptoms 3 and a half years after the disaster. A decrease of PTSD symptoms was observed at 53% which were consistent with a six month follow up. This was the first controlled study investigating the treatment of disaster-related PTSD, and the first controlled study investigating the treatment of children with PTSD.
- Greenwald (1994) completed a case study of 5 children with PTSD symptoms after Hurricane Andrew. One month after the EMDR intervention he found all five children to be functioning at the same level they were before the hurricane as reported by the parents.

EMDR research with children

- Soberman, Greenwald, & Rule (2002) administered 3 EMDR sessions on half of 29 boys in addition to traditional therapy. The EMDR group revealed significant reduction of PTSD symptoms and showed significant reduction of problem behaviors by the 2-month follow-up.
- A study of 10 institutionalized sex-offender adolescents found that 3 EMDR sessions (focusing on their own trauma) led to decreased disturbance, increased sense of cognitive control, and increased empathy for their victims (Datta & Wallace, 1996). Generally improved behavior in the school and the community was also reported, up to a year after treatment

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Scheck, Schaeffer, and Gillette (1998)

- Compared 2 sessions of EMDR with 2 sessions of Active Listening (AL), treating 60 females between the ages of 16 and 24, who were engaging in high-risk behaviors (substance abuse, unsafe sex, criminal acts, suicide attempts, etc.) and who had histories of trauma.
 - This study included random assignment, 24 well-trained therapists, independent blind assessment, and multiple standardized measures.
 - Although both groups improved post-treatment, EMDR outperformed AL on all five measures, with significant differences on four of the five.
- ...

...

Scheck, Schaeffer, and Gillette (1998)

- The EMDR group's post-treatment gains were also clinically significant, with mean scores falling within one standard deviation of the non-clinical norms on all measures, whereas for the AL group, only one of the measures was in the normal range. Two measures re-administered at 90 day follow-up showed maintenance of gains.
- Included both adolescent (ages 16-19, N=18) and young adult females (ages 20-25, N=42). This study found no differences in the responses of the young adults compared to the older adolescents in that EMDR was equally effective.

What does EMDR look like?



- Bilateral stimulation via eye movements or hand tapping as the client is guided through an 8-step protocol (Shapiro, 1995).
- The client chooses a painful memory or image, identifies the body sensations associated with that image and the negative cognition that identifies the self-belief related to the image. NC and PC
- After several sets of bilateral stimulation while holding these three elements in mind, the client feels less distress related to the memory. The client has been “desensitized” to the trauma.
- “Reprocessing” is utilized by having the client hold the negative image in mind while creating a positive cognition or new belief about the memory.



Tools used with EMDR



Resouces
From
Neurotek



DARK, BAD DAY... GO AWAY!

A BOOK FOR CHILDREN ABOUT TRAUMA & EMDR



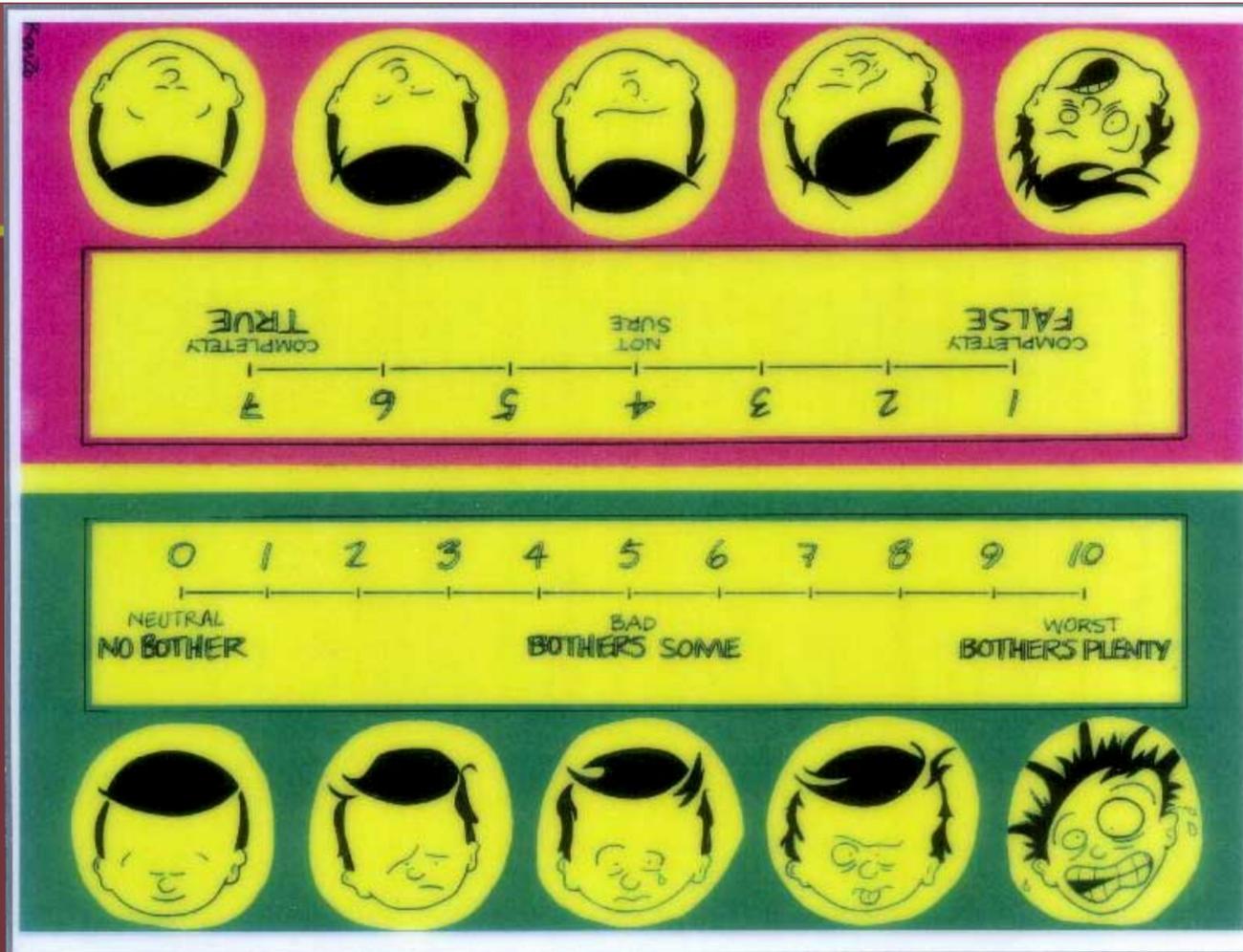
Written by Ana M. Gomez, M.C.

Illustrated by Carlos Serrano Aceña

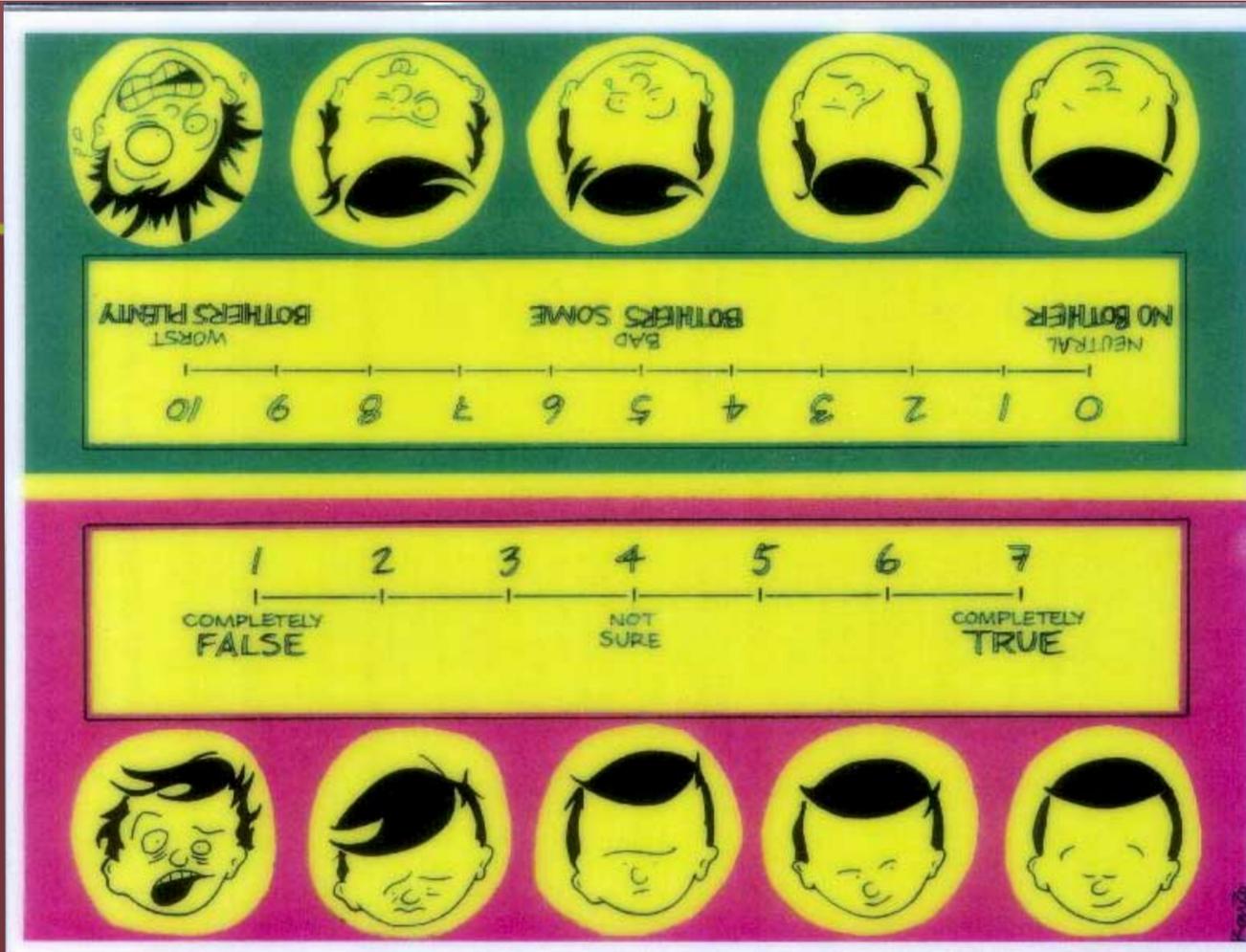
● www.anagomeztherapy.com

EMDR 8-Phase Protocol

- Phase I: Client history and treatment planning.
- Phase II: Preparation. This involves building rapport with the child, addressing the child's concerns, and establishing a safe place.
- Phase III: Assessment of a target image, a negative cognition, a positive cognition, a validity of cognition rating or VOC, the emotions associated with the target image, a rating of the emotional disturbance or SUDS, Subjective units of disturbance, the physical sensations associated with the emotions, and the locations of the physical sensations.
- Phase IV: Desensitization. Sets of BLS with SUDS level.
- Phase V: Installation of positive cognition with VOC
- Phase VI: Body scan.
- Phase VII: Closure. The therapist gives final intrusions.
- Phase VIII: Reevaluation



NC Examples: I'm bad, I have to be perfect, I can't win, I'm a failure, I'm weak, I am not safe, I cannot let it out, I am ugly.
 Move from No one loves me to I'm not loveable.



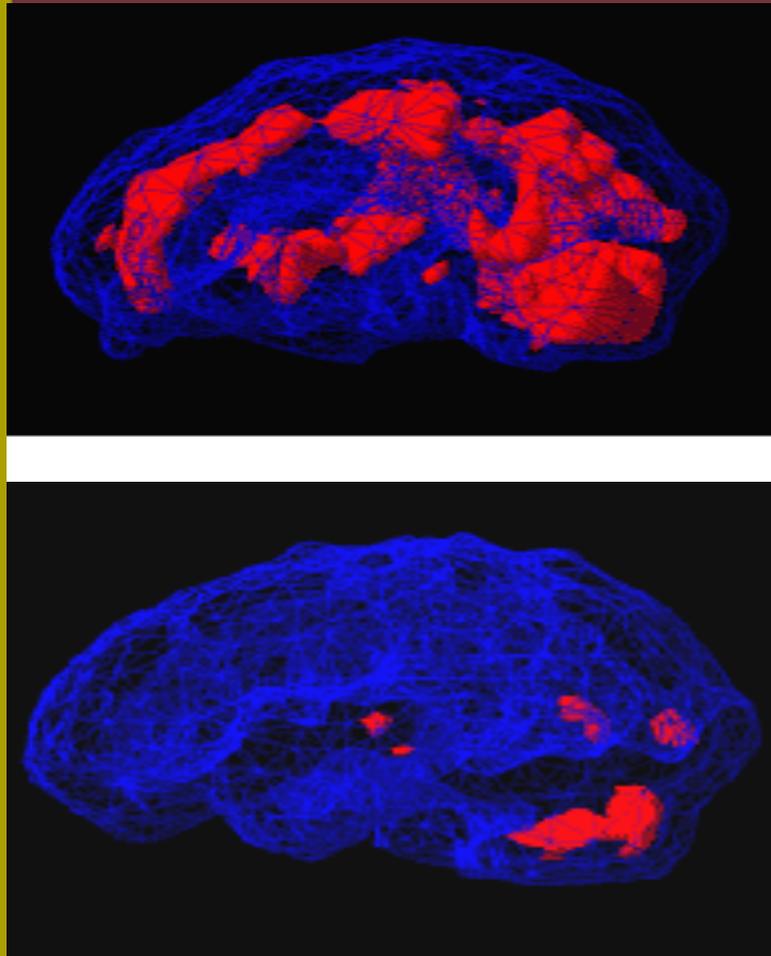
PC Examples: I am loved, I'm okay just the way I am, I can succeed, I am strong, I did the best I could, I can handle it, I am important, I learned from it. It's over and I survived, I can choose now

Protocol variations with children



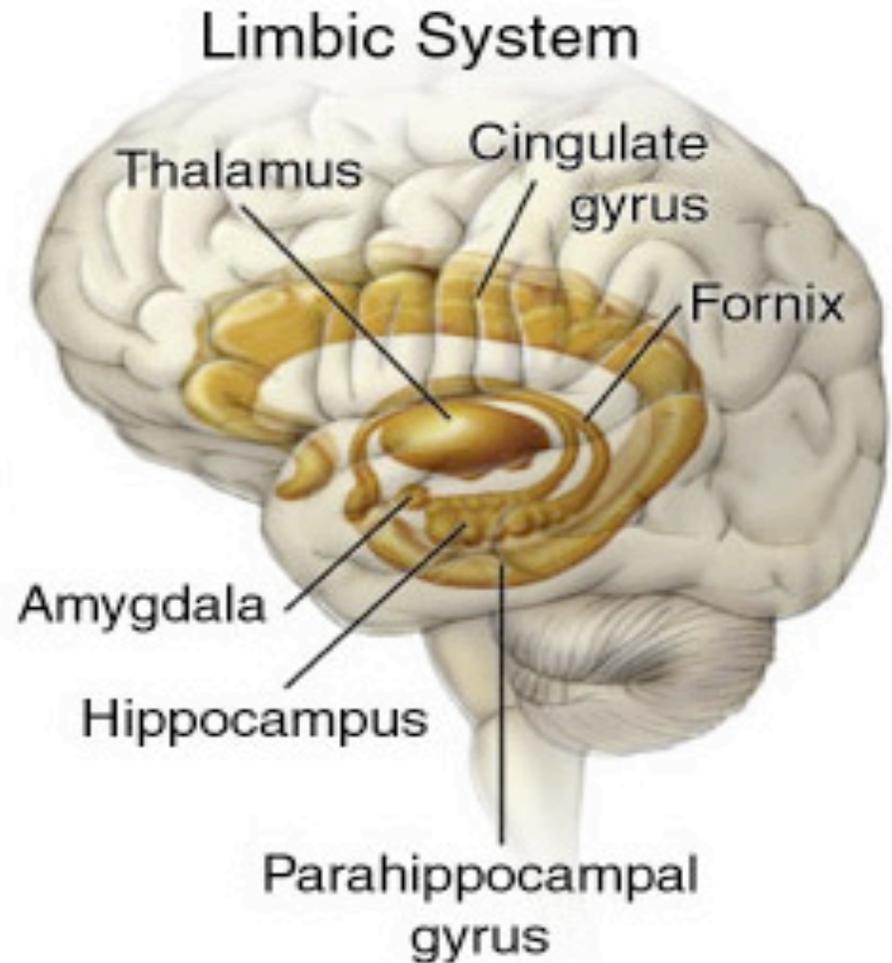
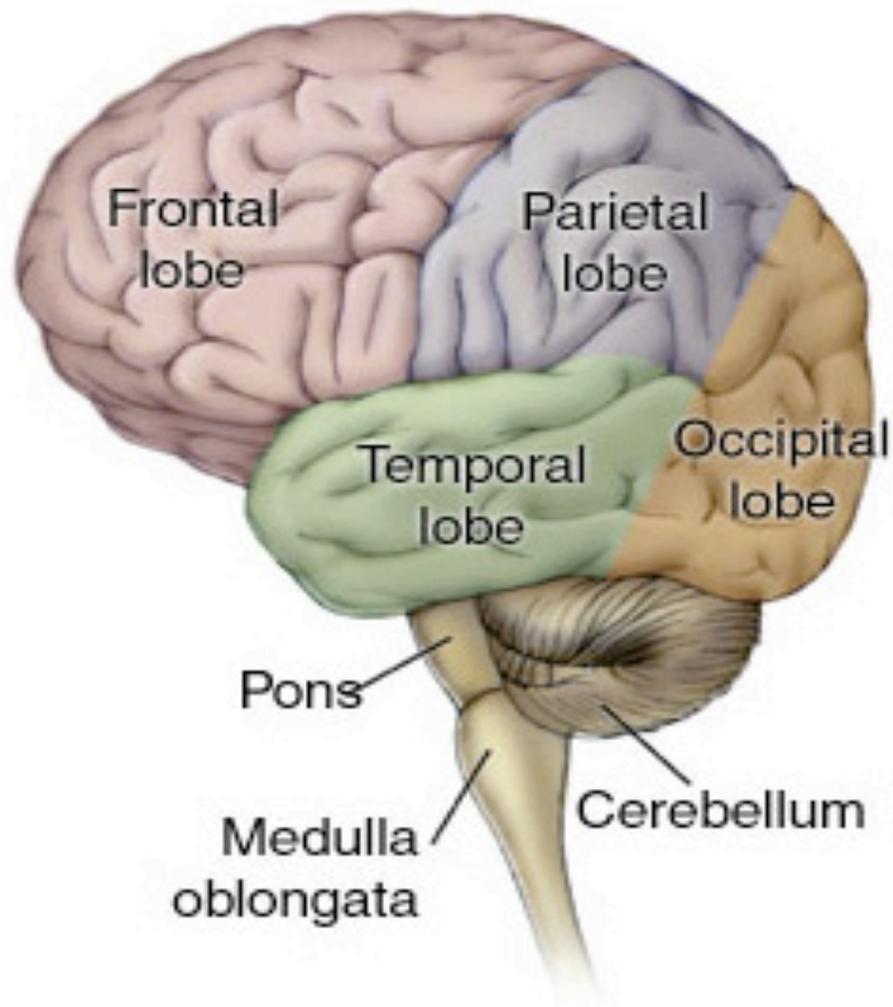
- Use of Art, play, story or sand for target identification and representation
- More simple NC and PC
- Can't cross the midline... so tapping or salt/pepper shakers are used.
- Use of faces for measurements (SUDS/ VOC)
- Creative resources (superheros or bigger self)

Before and After SPECT Scans



- Before and after EMDR brain scans. Top photo shows woman with Post Traumatic Stress Disorder. Bottom photo shows same patient after four ninety minute EMDR sessions. The red areas indicate overactivity in the brain. Photo by Dr. Daniel Amen

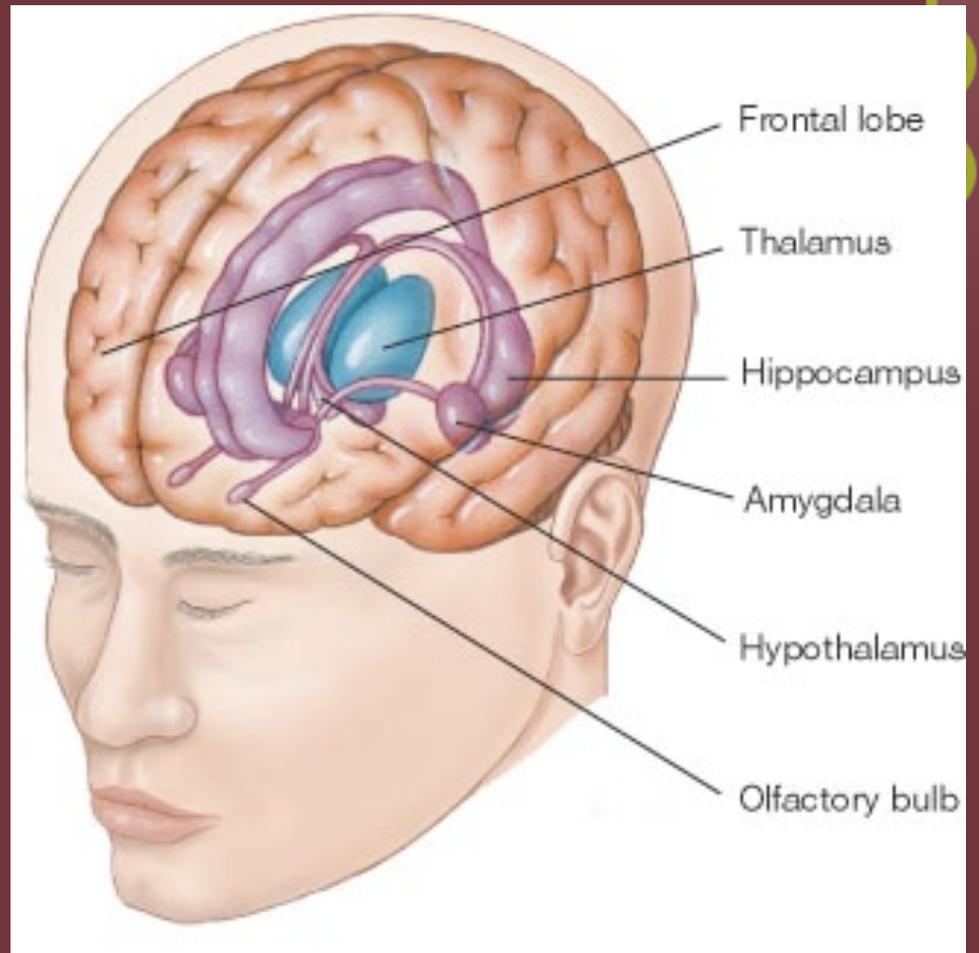
Anatomy of the Brain



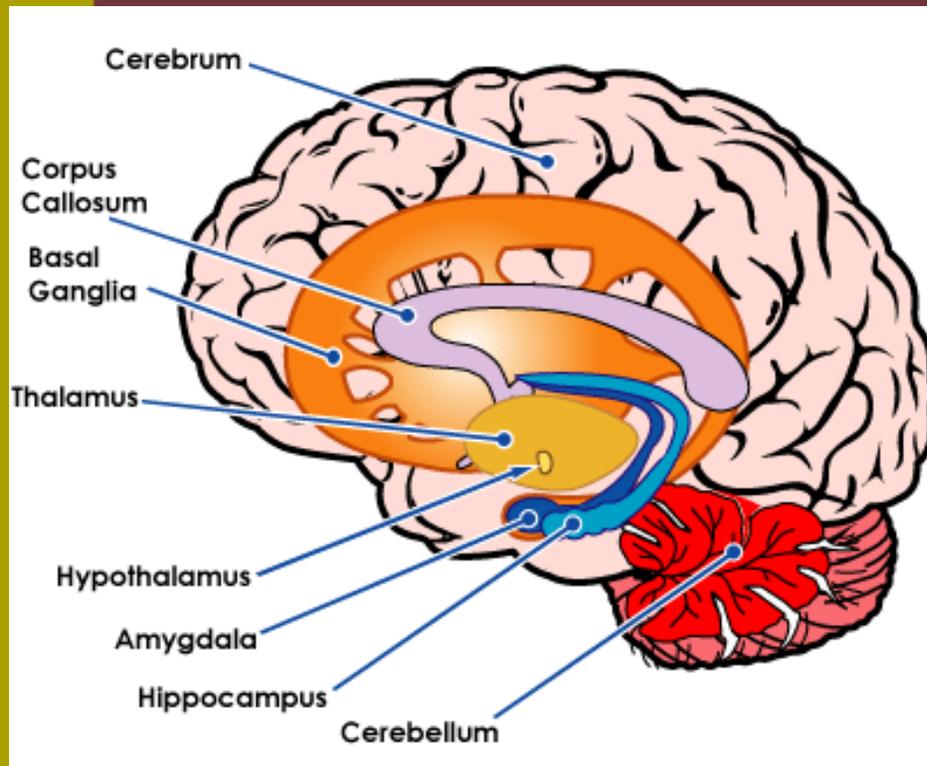
● ● ● Limbic System

● Functions

- sets the emotional tone of the mind
- filters external events through internal states (emotional coloring)
- tags events as internally important
- stores highly charged emotional memories
- modulates motivation
- controls appetite and sleep cycles
- promotes bonding
- directly processes the sense of smell
- modulates libido



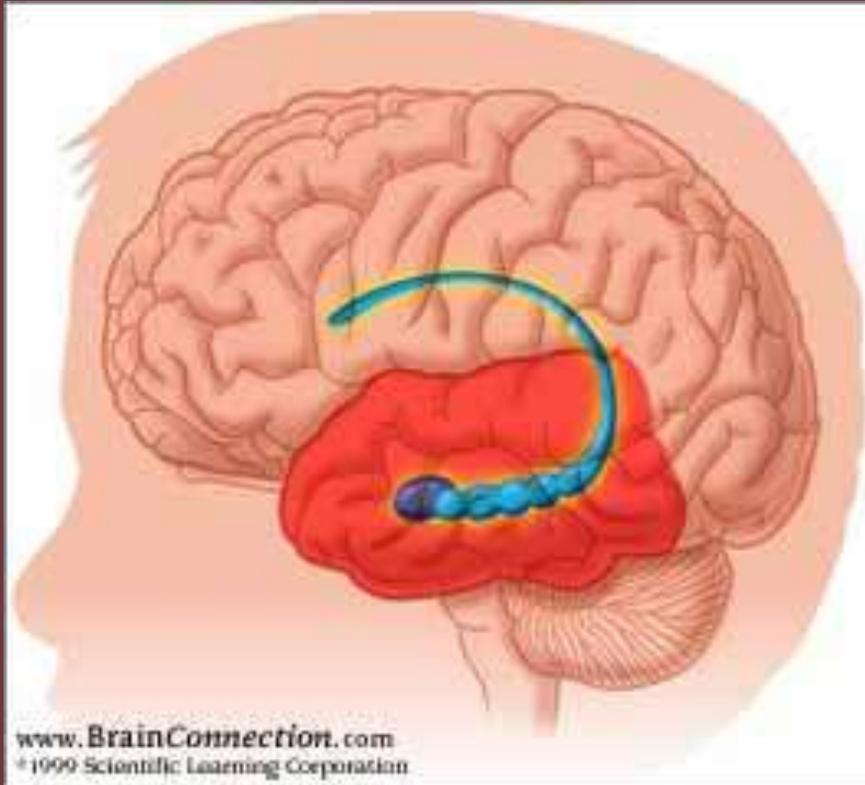
Limbic System



Problems

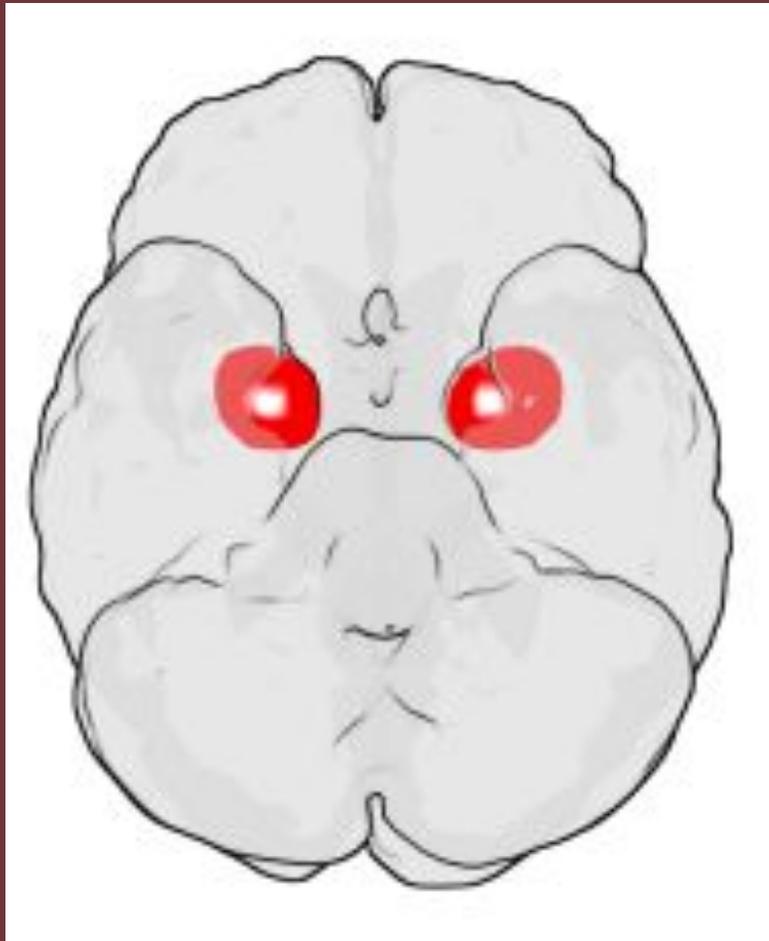
- moodiness, irritability, clinical depression
- increased negative thinking
- perceive events in a negative way
- decreased motivation
- flood of negative emotions
- appetite and sleep problems
- decreased or increased sexual responsiveness
- social isolation

Hippocampus



- Hippocampus--mediates the formation and retrieval of episodic or autobiographical memory
- Mediates Context and significance (time and place)

Amygdala



- Amygdala---seat of the emotions.
- All memories have emotional color... positive, negative, neutral
- In PTSD brain, hyperexcitation in the amygdala (Hull, 2002). Also seen as larger in PTSD brain.

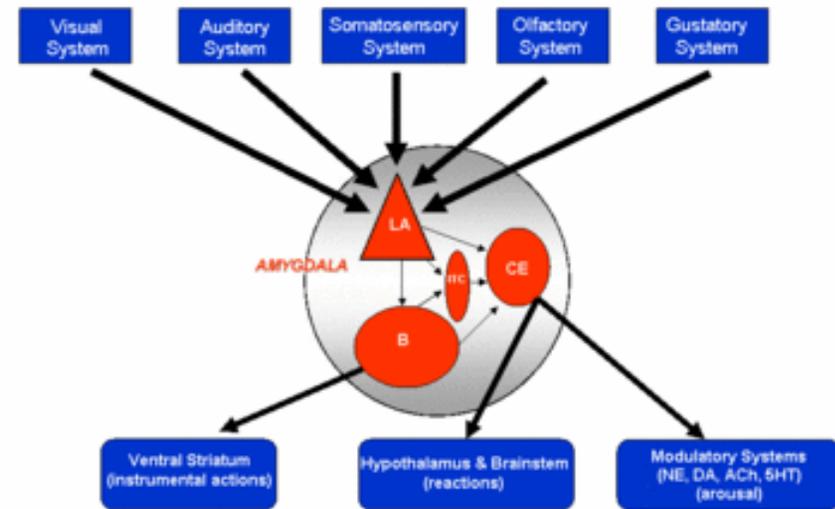
Amygdala

The amygdala is the central junction where information from all senses is tied together and endowed with emotional meaning.

-poised like an **alarm**

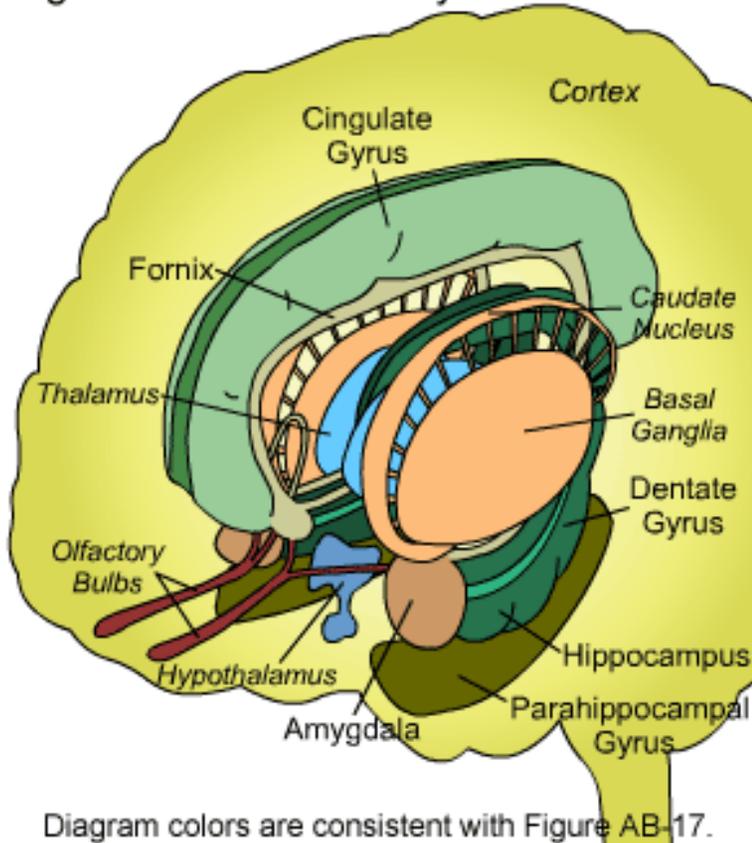
- Receives sensory input (sight, smell, taste, touch, feel) which may activate the “alarm”, release of epinephrine and norepinephrine. NE activate the Vagus nerve which signals back to amygdala to strengthen the memory of what just happened. (Bergmann, 2008)
- This amygdaloid arousal seems to imprint in memory most moments of emotional arousal with an added degree of strength (Goleman, 1995) . The more intense the amygdaloid arousal, the stronger the imprint (LeDoux, 1986).

FLOW OF SENSORY INFORMATION TO THE LATERAL AMYGDALA THROUGH AMYGDALA CIRCUITS TO OUTPUT SYSTEMS



● ● ● Limbic system

Figure AB-16: Limbic System

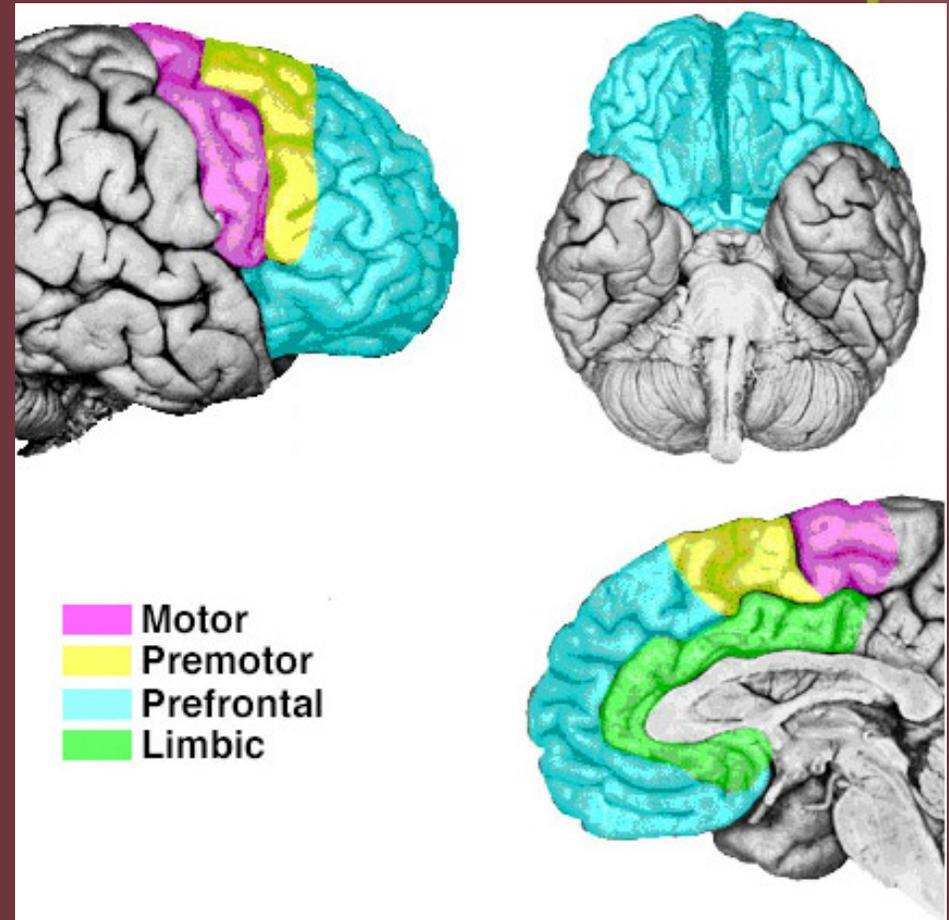


- Thalamus:^{[3][5]} The "relay station" to the cerebral cortex....gateway to the sensory info in the cerebral cortex
- Anterior Cingulate Gyrus (girdle)
 - mediates attention shifts
 - connects affect and cognition
 - Amplifies or filters emotion
 - play a role in rational cognitive functions:
 - reward anticipation,
 - decision-making
 - empathy and emotion.

Prefrontal Cortex

Functions

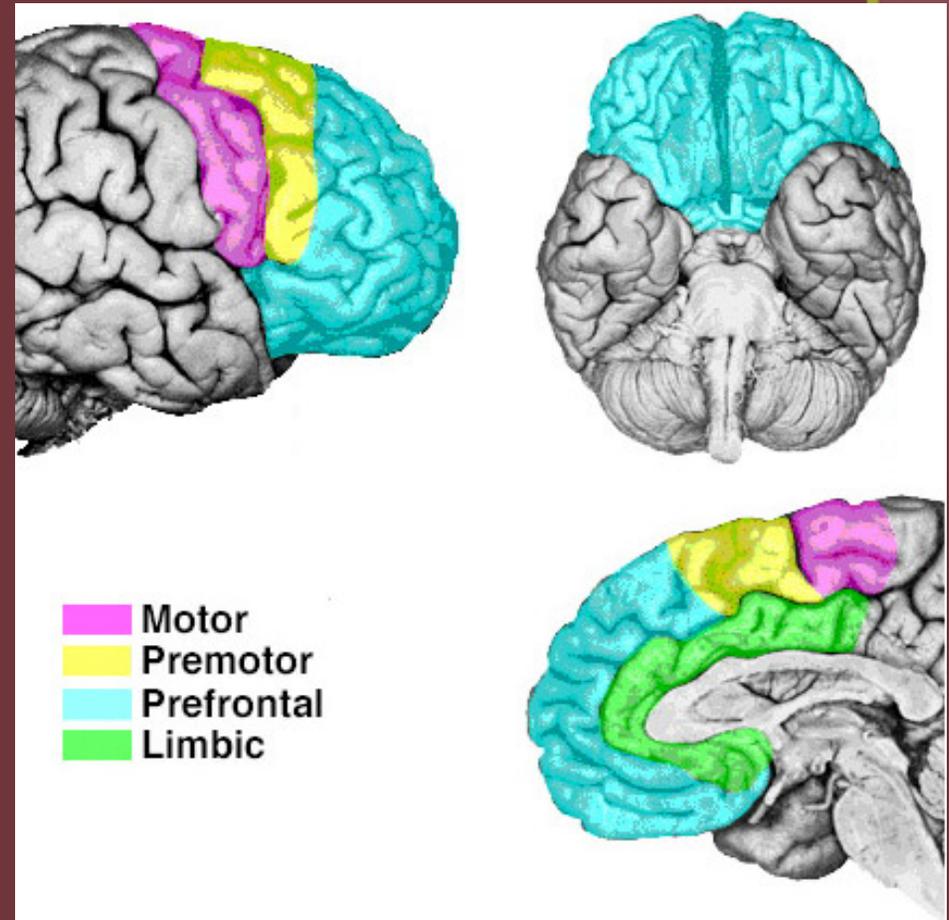
- attention span
- Regulates emotions and decision making
- Perseverance
- Judgment
- impulse control
- Organization
- self-monitoring
- problem solving
- critical thinking
- forward thinking
- learning from experience
- ability to feel and express emotions
- influences the limbic system
- empathy



Prefrontal cortex

Problems

- short attention span
- Distractibility
- lack of perseverance
- impulse control problems
- Hyperactivity
- chronic lateness, poor time management
- Disorganization
- Procrastination
- unavailability of emotions misperceptions
- poor judgement
- trouble learning from experience
- short term memory problems
- social and test anxiety

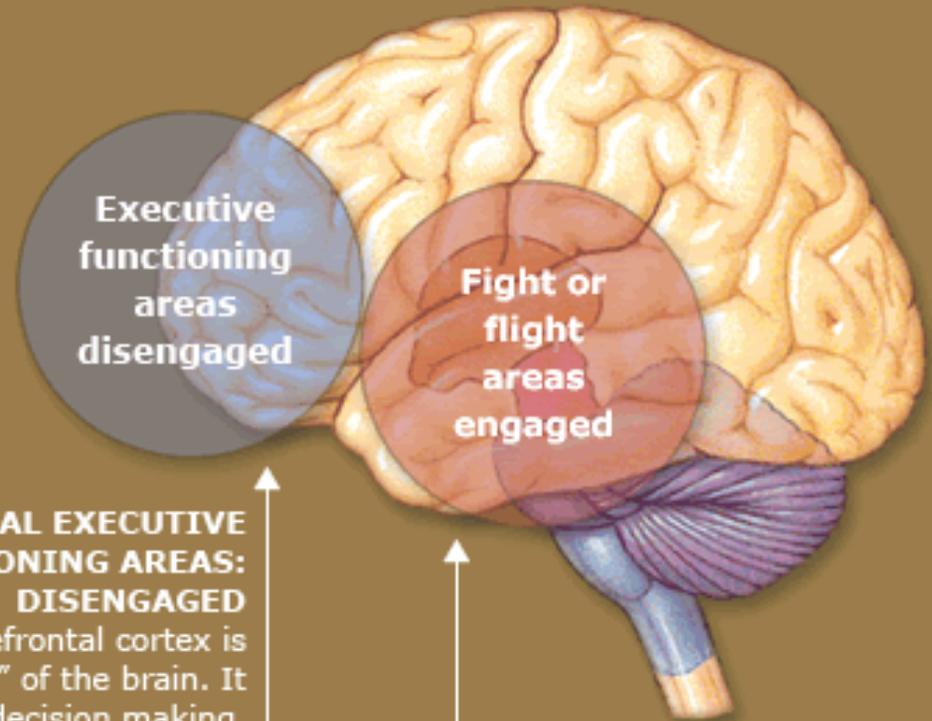


Fight or Flight Response

- Correct order is Freeze, Flight, Fight



Emotional Hijacking



FRONTAL EXECUTIVE FUNCTIONING AREAS: DISENGAGED

The prefrontal cortex is the "CEO" of the brain. It regulates decision making, judgment, planning, moral reasoning, and sense of self. Stressful experiences (academic pressure, sleep deprivation, substance abuse, etc.) disengage the frontal lobes. Over time, this can lead to impulsive, short-sighted, even violent behavior; increased anxiety; depression; alcohol and drug abuse; learning disorders; and increased stress-related diseases.

SUBCORTICAL FIGHT OR FLIGHT AREAS: ENGAGED

The subcortical arousal system—thalamus, hippocampus, brainstem, and hypothalamus—mobilizes the body for action, increasing heart rate, respiratory rate, and muscle tone. The nature of this system is to bypass the frontal executive functioning and trigger the fight or flight mode.

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“It was the classic fight or flight response.
Next time, try flight.”

HIPPOCAMPUS: Cements the response to the threat into long-term memory

PUPILS: Dilate, ready to relay signs of danger to the visual thalamus

SALIVA: Decreases as digestive system slows

THYROID GLAND: Raises resting metabolic rate

LUNG: Bronchioles dilate, taking in more oxygen

HAIR: Stands on end

ANATOMY OF FEAR

Within seconds of perceiving a threat, the primitive amygdala sounds a general alarm. The adrenal system promptly floods the body with adrenaline and stress hormones. Nonessential physiological processes switch off. Digestion stops, skin chills, and blood is diverted into muscles in preparation for a burst of emergency action. Breathing quickens, the heart races, and blood pressure skyrockets, infusing the body with oxygen while the liver releases glucose for quick fuel. The entire body is suddenly in a state of high alert, ready for fight or flight.

—J. S.

LIVER: Begins to break down glycogen for instant energy to keep up with higher metabolic rate

HEART: Blood pressure and heart rate spike, infusing brain and muscles with ready fuel

SPLEEN: Contracts, pumping out white blood cells and platelets in preparation for possible physical injury

STOMACH AND GASTROINTESTINAL TRACT: Vessels constrict to divert blood to muscles

BLADDER AND COLON: Prepare to void their contents in preparation for violent action and possible injury

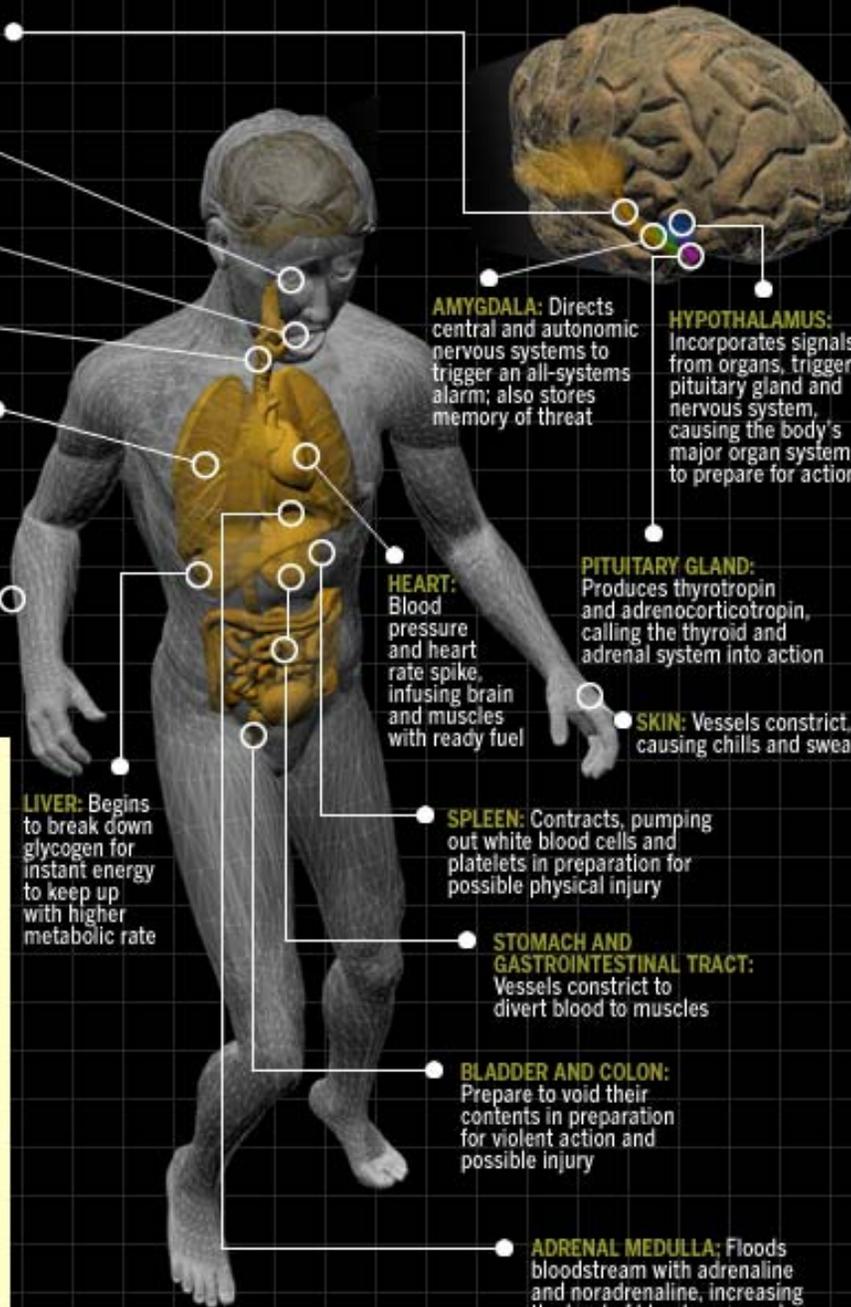
ADRENAL MEDULLA: Floods bloodstream with adrenaline and noradrenaline, increasing the level of blood sugar and constricting blood vessels

AMYGDALA: Directs central and autonomic nervous systems to trigger an all-systems alarm; also stores memory of threat

HYPOTHALAMUS: Incorporates signals from organs, triggers pituitary gland and nervous system, causing the body's major organ systems to prepare for action

PITUITARY GLAND: Produces thyrotropin and adrenocorticotropin, calling the thyroid and adrenal system into action

SKIN: Vessels constrict, causing chills and sweat



FIGHT or FLIGHT

NOTICEABLE EFFECTS

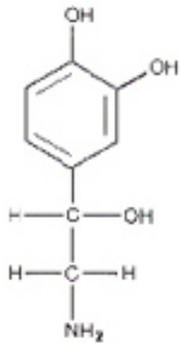
PUPILS DILATE
MOUTH GOES DRY
NECK + SHOULDER
MUSCLES TENSE
HEART PUMPS FASTER
CHEST PAINS
PALPITATIONS
SWEATING
MUSCLES TENSE
FOR ACTION
BREATHING FAST
+ SHALLOW -
HYPERVENTILATION
OXYGEN NEEDED
FOR
MUSCLES

HIDDEN EFFECTS

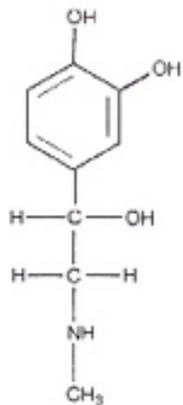
BRAIN GETS BODY
READY FOR ACTION
ADRENALINE
RELEASED FOR
FIGHT/FLIGHT
BLOOD PRESSURE
RISES
LIVER RELEASES
GLUCOSE TO PROVIDE
ENERGY FOR MUSCLES
DIGESTION SLOWS -
OR CEASES
SPHINCTERS CLOSE -
THEN RELAX
CORTISOL RELEASED
(DEPRESSES THE
IMMUNE SYSTEM)

F. Hedges

Fight or Flight Response



Norepinephrine
(Sympathetic Nerves)



Epinephrine
(Adrenal Medulla)

↑ Heart Rate
↑ Blood Pressure

β_1

Peripheral
Vasoconstriction

α_1

↑ Lipid Breakdown

β_2

Coronary Dilation
Bronchial Dilation

β_2

Glycogen → Glucose

β_2

Memory

- IMPLICIT

- Perceptual Representational
- Unconscious
- Somatosensory
- Non-verbal

- EXPLICIT

- Episodic

- Sense of time and space
- autobiographical

- Semantic Memory

- Meaning
- Hyper-associative

••• Episodic vs. Semantic Memory

- Very little of our experience is remembered as episodic memory.
Instead... The brain extracts and abstracts the meaning of our experience... Semantic Memory
- By the Age of 40...
A person has lived through 1/4 million hours of memory.... Yet only approx. 1000 hours of episodic memory are available.



Characteristics of Episodic and Semantic Memory

	<u>Episodic Memories</u>	<u>Semantic Memories</u>
● Memory content	isolated memories of distinct events	General knowledge abstracted from episodic memories and integrated with other semantic memories
● Brain localization	hippocampus, medial temporal lobe	neocortex
● Storage density (overlap, ambiguity)	sparse	dense
● Initial strength	high	low
● Speed of consolidation	rapid	slow
● Longevity	relatively short (but can be years)	relatively long (but can slowly disappear with disuse)

How Memories are Formed

- Memories, or the things we remember, are stored temporarily in the hippocampus. When that memory is recalled, the body or emotional sensations that accompany the memory are also recalled.
- As time passes, the brain naturally transfers the memory into the neocortical system allowing “the person to learn from the event” (Strickgold, 2002, p. 67). According to Dr. Strickgold, this transference often occurs during REM sleep.



How Traumatic Memories are stored

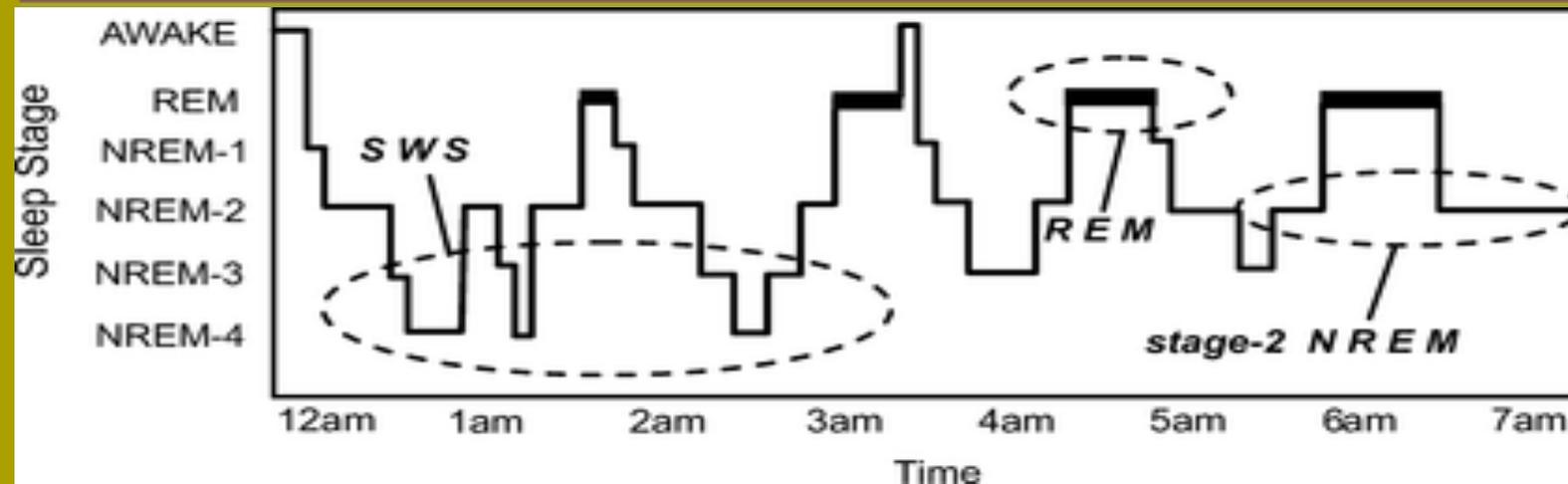
- However, if the initial memory is traumatic in nature, the brain has difficulty in completing this transfer. It gets “stuck” or “Frozen”
 - Along with the initial childlike interpretation or belief and the sensory information (TRIGGERS!)
- The result is PTSD as evidenced by nightmares and frequent enactment of the sensory responses associated by the memory.
- During EMDR, this transference process is accelerated and processed so that the sensory responses and stimuli are no longer disturbing (Bergmann, 1998).



What happens during REM sleep

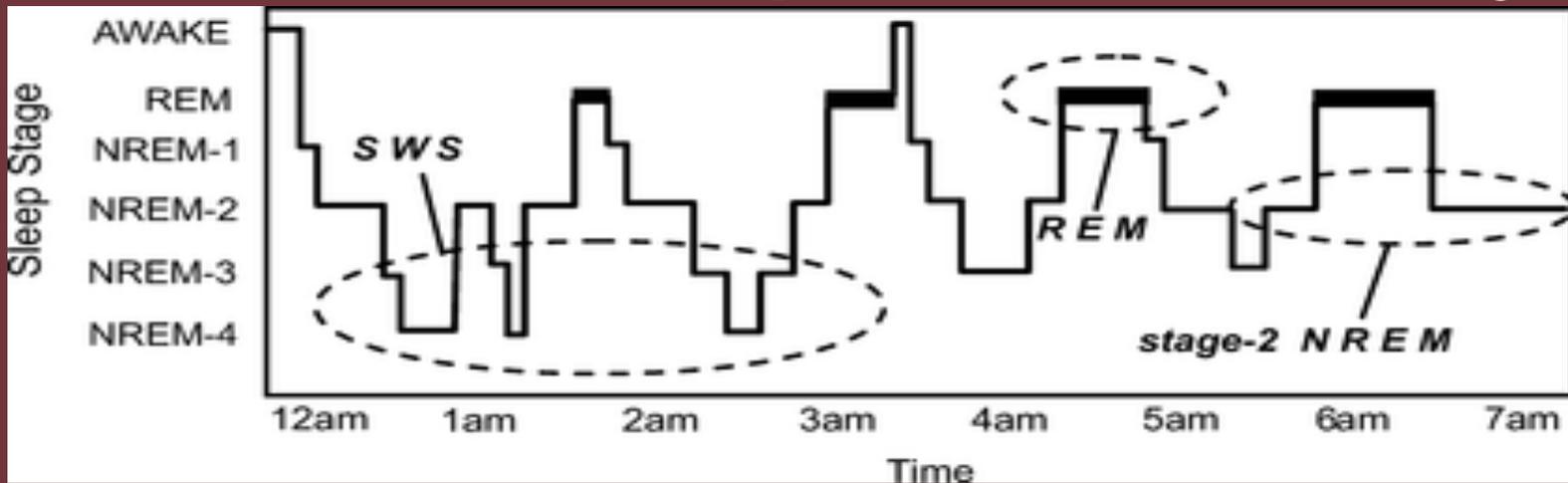
- Memory consolidation --the mind processes short term memories into long-term storage, sorting out what is important from what is incidental.
- Neural Stimulation--REM sleep drops off as a person ages, leading some experts to believe that the neural stimulation during infancy and childhood is vital to the developing mind, but not as important to the adult mind.
- Rebooting Neurons --the monoamine receptors to shut down and reboot. This increases the brain's sensitivity to neurotransmitters. Repeated interruptions of REM sleep can lead to depression, crankiness and lack of cognitive function.

Sleep Cycle



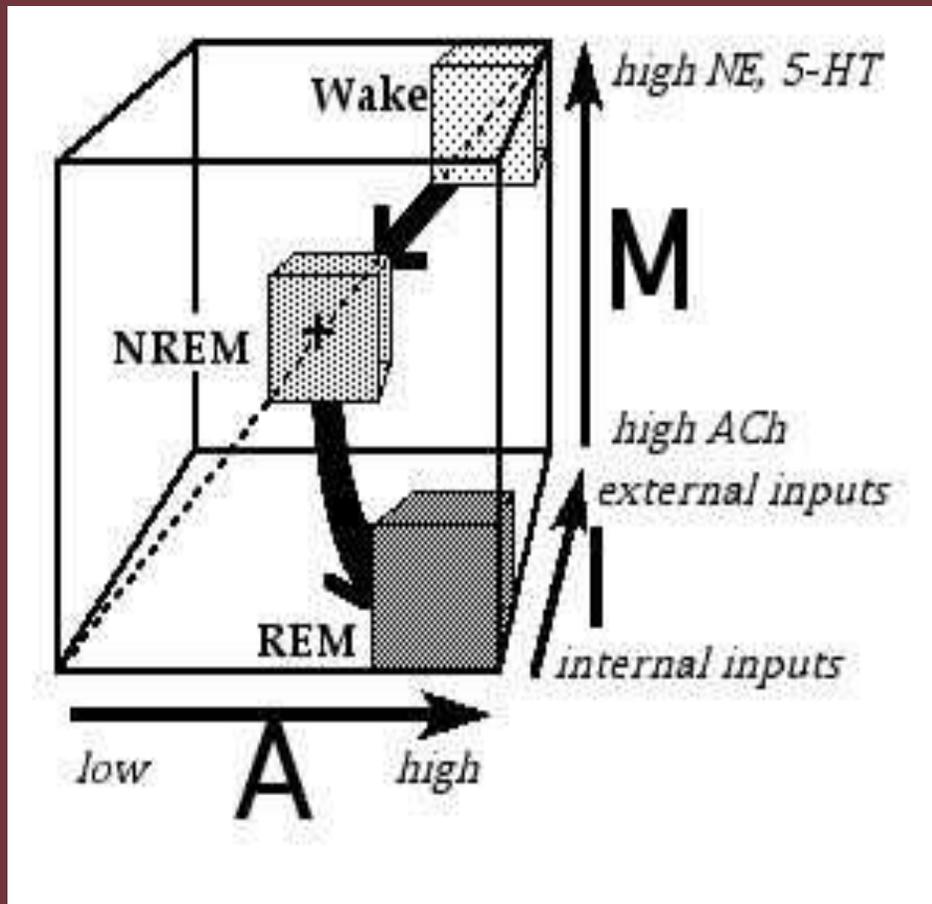
- REM occurs first after 90 minutes.
- REM sleep lengthens each time.
- There is a surge of Acetylcholine and suppression of all other neurotransmitters during REM

REM vs. NON-REM sleep and Semantic vs. Episodic memory



- Non-Rem is only episodic memory
- REM is only Semantic memory (Semantic cortex)
- REM is where we process emotional memory
- Brain has to completely down-regulate itself to get into REM...and if episodic memories are tough, it cannot process the memory and the result is nightmares, waking up, or not having enough REM sleep.

AIM State Space Model



- (Hobson, Pace-Schott, Strickgold)
- Activation
- Input (like PGO Waves)
- Modulation (neuro)
- Notice High Neurotransmitters in wake state
- Notice High ACh and low Neurotransmitter activity during REM

What does EMDR do?



- Pairs the simulation of REM sleep (created by bilateral stimulation) with traumatic unprocessed episodic memory stored in the hippocampus and gives it new mature and freeing semantic meaning...which is then transferred to the neocortex.
- As this happens the sensory info is also processed via neural oscillation in the thalamus creating sensory integration.

Oscillation and Temporal binding in the Thalamus

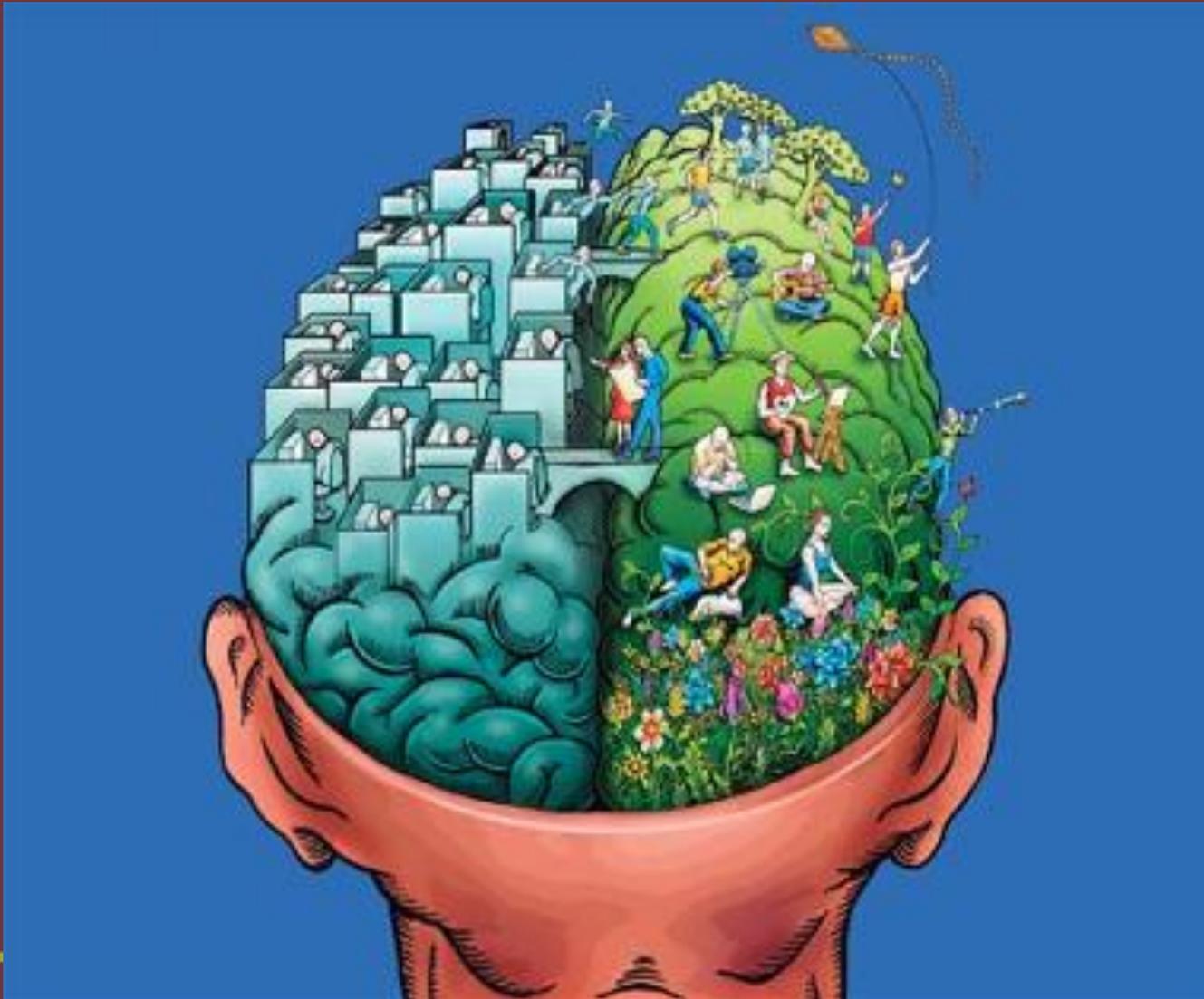


- Interhemispheric coherence (balance) appears to be mediated by the corpus callosum as a result of its ability to facilitate the synchronous oscillation of bilateral neural networks and their dynamic functional connectivity.
- Neurobiological studies of PTSD have consistently shown marked right-sided lateralization. It would seem more than plausible, then, that repair to the thalamus and its central function of synchronous oscillation and binding would mediate the repair of the corpus callosum and of the lateralization.
- Additionally, the ventrolateral thalamic nucleus projects to and activates the dorsolateral cortices (the most consistent finding of EMDR neuroimaging), further facilitating the integration of traumatic memories into semantic and other neocortical networks.
- Thus, EMDR has the ability to restore thalamus functioning and somatosensory integration.

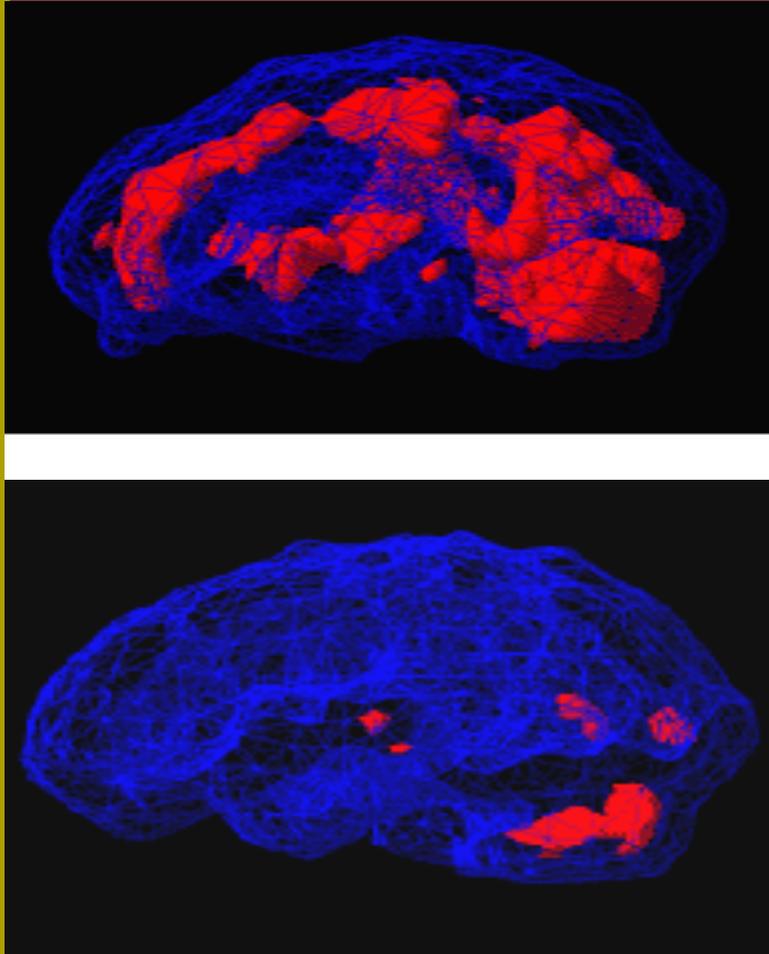
- Bergmann, Neurobiology of EMDR, 2007



EMDR creates communication in the brain by processing old memories across the hemispheres...opening up new possibilities for meaning



Before and After SPECT Scans



- Before and after EMDR brain scans. Top photo shows woman with Post Traumatic Stress Disorder. Bottom photo shows same patient after four ninety minute EMDR sessions. The red areas indicate overactivity in the brain. Photo by Dr. Daniel Amen

PTSD and EMDR

Oh and Choi 2007

Changes in the Regional Cerebral Perfusion After Eye Movement Desensitization and Reprocessing

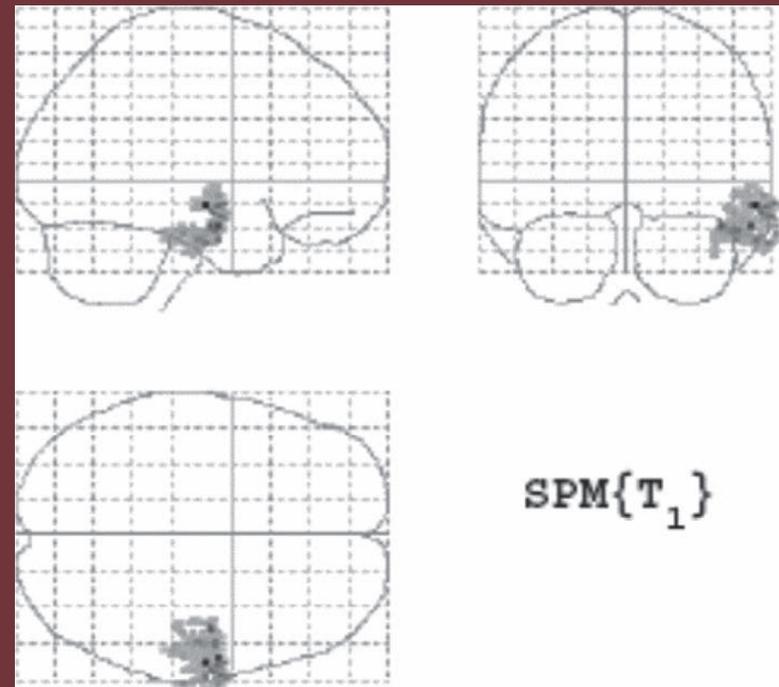
- PTSD brain Pre-treatment: the participants' pretreatment brain scans with those of normal controls revealed greater blood flow in the limbic system and lesser flow in the prefrontal cortex.
- consistent with previous neuroimaging literature for PTSD, which showed hyperexcitation in the amygdala and decreased function of the anterior cingulate and the prefrontal cortex (Hull, 2002).

PTSD and EMDR

Oh and Choi 2007

Changes in the Regional Cerebral Perfusion After Eye Movement Desensitization and Reprocessing

- Post Treatment:
- Regions of **decreased** cerebral blood flow after EMDR treatment.
- Significant deactivation was in the limbic system:
 - right middle temporal and the right subgyral gyrus (BA 20 and 21). The arrow indicates the right middle temporal gyrus, the most significantly deactivated area.

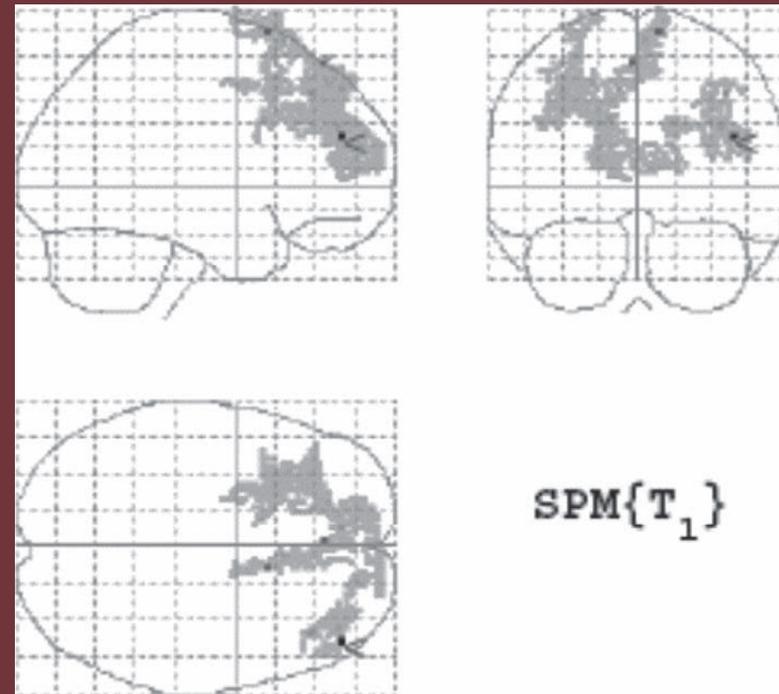


PTSD and EMDR

Oh and Choi 2007

Changes in the Regional Cerebral Perfusion After Eye Movement Desensitization and Reprocessing

- Post Treatment:
- Regions of increased cerebral blood flow after EMDR treatment. Significant activations in the prefrontal cortex:
 - right middle frontal lobes and the right superior frontal gyrus (BA 6, 8, 9, 10, and 46) and also in the left medial frontal and right superior frontal gyrus



What else does EMDR help?

- Dissociative disorders (e.g, Fine & Berkowitz, 2001; Lazrove & Fine, 1996; Paulsen, 1995);
- performance anxiety (Foster & Lendl, 1996; Maxfield & Melnyk, 2000);
- body dysmorphic disorder (Brown et al., 1997);
- pain disorder (Grant & Threlfo, 2002);
- personality disorders (e.g., Korn & Leeds, 2002; Manfield, 1998).
- depression (Shapiro, 2002),
- attachment disorder (Siegel, 2002),
- social phobia (Smyth, & Poole, 2002),
- anger dyscontrol (Young, Zangwill, & Behary , 2002),
- generalized anxiety disorder (Lazarus, & Lazarus , 2002),
- distress related to infertility (Bohart & Greenberg, 2002),
- body image disturbance (Brown, 2002),
- marital discord (Kaslow, Nurse, & Thompson, 2002),
- existential angst (Krystal, Prendergast, Krystal, Fenner, Shapiro, Shapiro, 2002);

Adapted from Emdr.com

PTSD and EMDR

Oh and Choi 2007

Changes in the Regional Cerebral Perfusion After Eye Movement Desensitization and Reprocessing

- Taken all together, this study suggests that the mechanism of therapeutic effectiveness in EMDR may be as follows:
 - (a) emotional regulation by increased activity of the prefrontal lobe,
 - (b) inhibition of overstimulation in the amygdalae by regulating the association cortex,
 - (c) transformation of past traumatic memory, and
 - (d) induction of functional balance between the limbic system and the prefrontal lobe.

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For training and more information

- www.edmr.com



Welcome to EMDR Institute, Inc.

EYE MOVEMENT DESENSITIZATION AND REPROCESSING

- www.emdria.org



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