Trauma, Neuroscience and Recovery

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Agenda

- Mind-Brain-Gene Feedback Loops
- Neuropathologies
- Memory System Dysregulations
- Balanced states of mind=“Mind”
- SEEDS factors
- Integration of Psychotherapies

Theme Colors

Purple color family and teal—Main presentation

Green—Client information

Yellow—Neuroscience

Red—Anxiety and stress

Blue—Depression

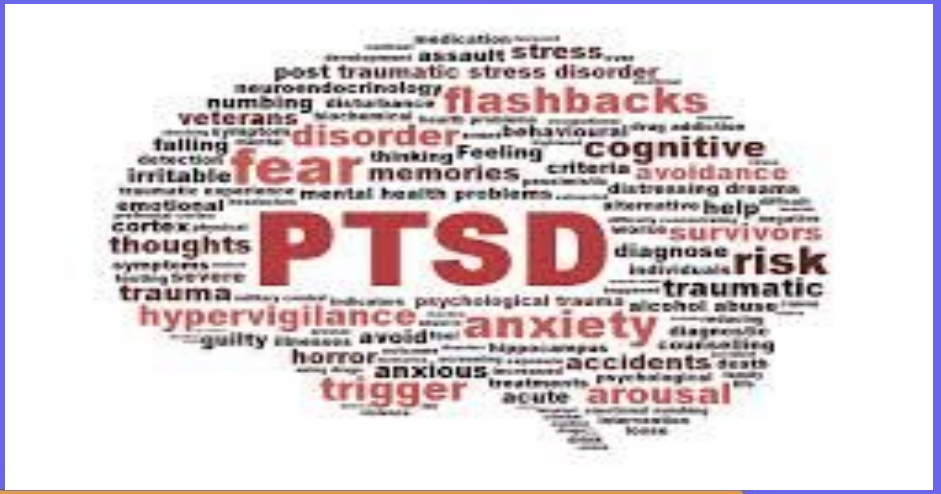
Chronic, severe, inescapable

- War Zones
- Rape
- Child abuse
- Elder abuse
- Domestic violence
- Refugees

Refugee Crisis

Re-traumatization caused by:

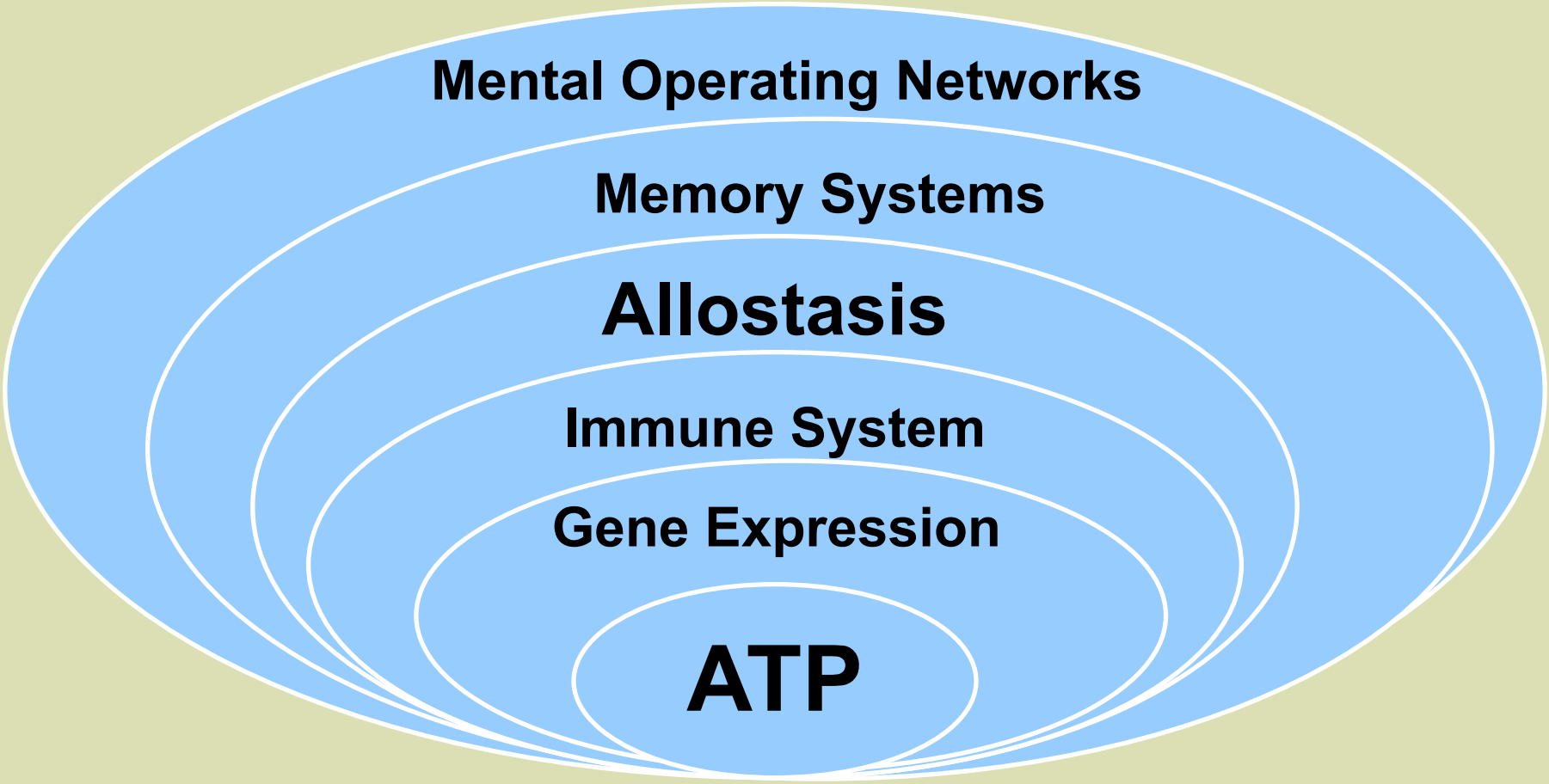
- relentless war in the region
- growing level of violence
- traumatic experiences
- extreme deprivation in daily life



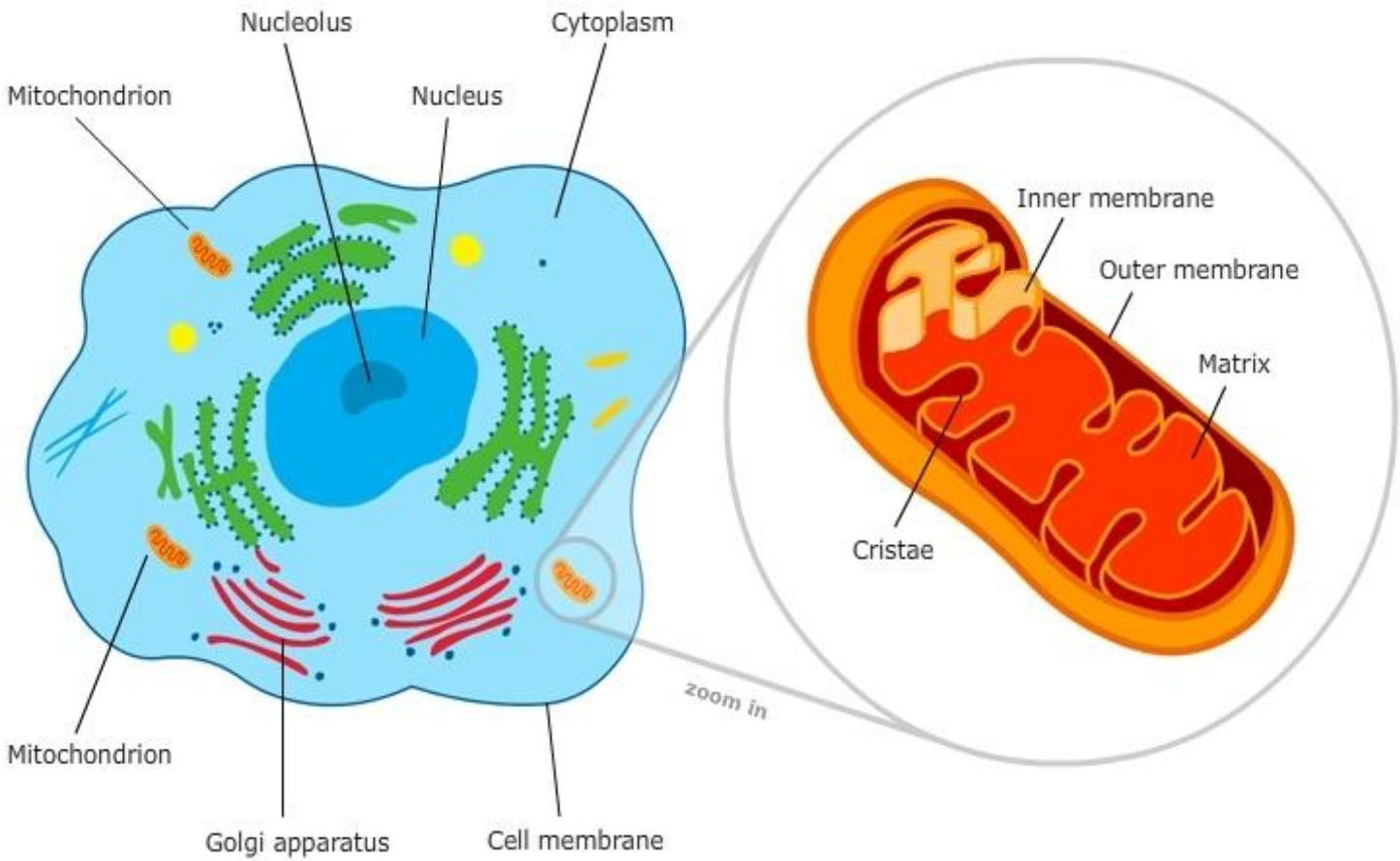
The Cartesian Blizzard

Abreaction therapy
ACT
Adlerian therapy
Adventure therapy
Analytical psychology
Art therapy
Attack therapy
Attachment-based psychotherapy
Attachment-based therapy (children)
Attachment therapy
Autogenic training
Behavior modification
Behavior therapy
Biodynamic psychotherapy
Bioenergetic analysis
Biofeedback
Body psychotherapy
Brief psychotherapy
Classical Adlerian psychotherapy
Chess therapy
Child psychotherapy
Client-centered psychotherapy
Co-counselling
Cognitive analytic therapy
CBT
Coherence therapy
Collaborative therapy
CFT
Concentrative movement therapy
Contemplative psychotherapy
Conversational model
Conversion therapy
Core process psychotherapy
Dance therapy

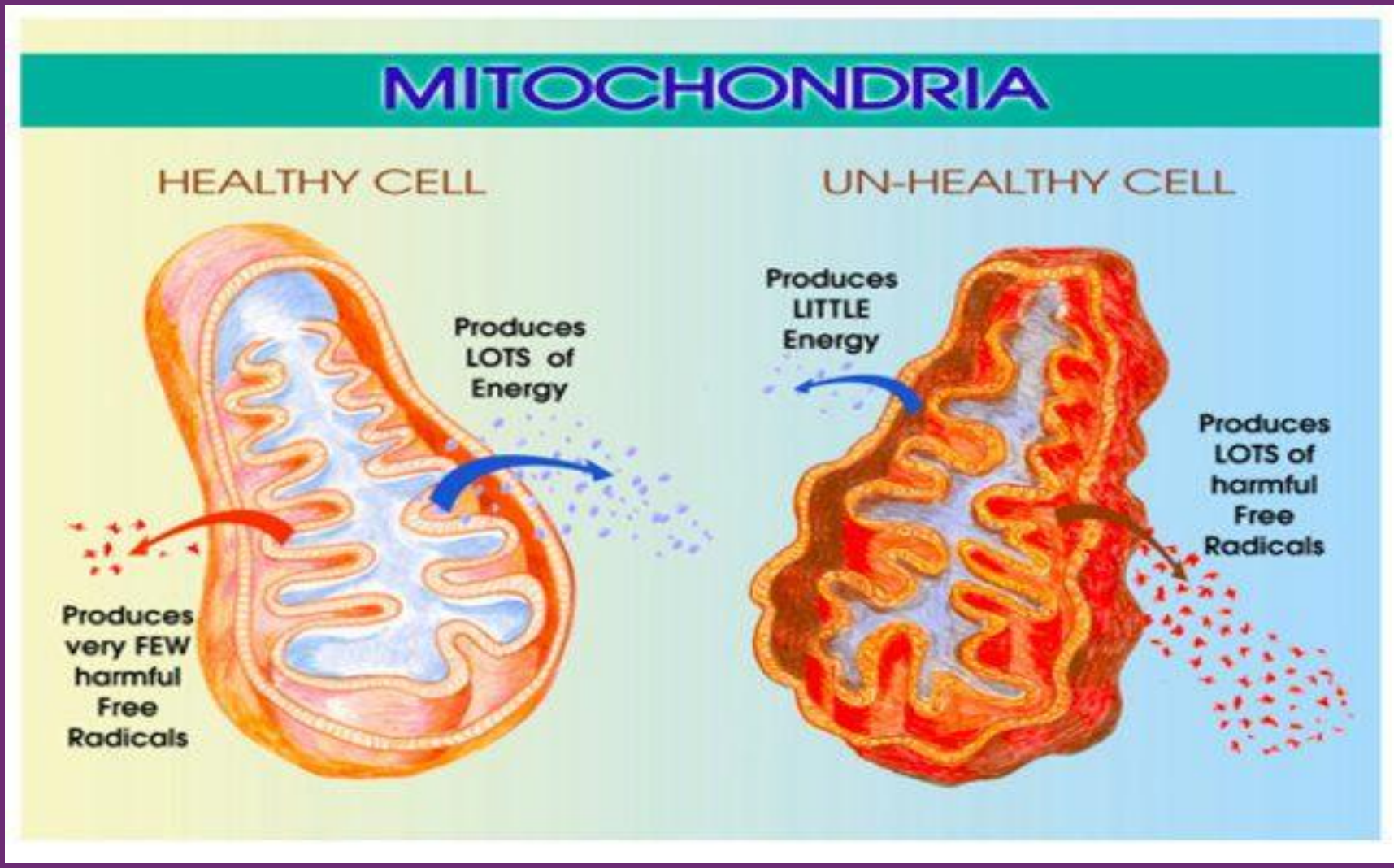
Recovery from Trauma



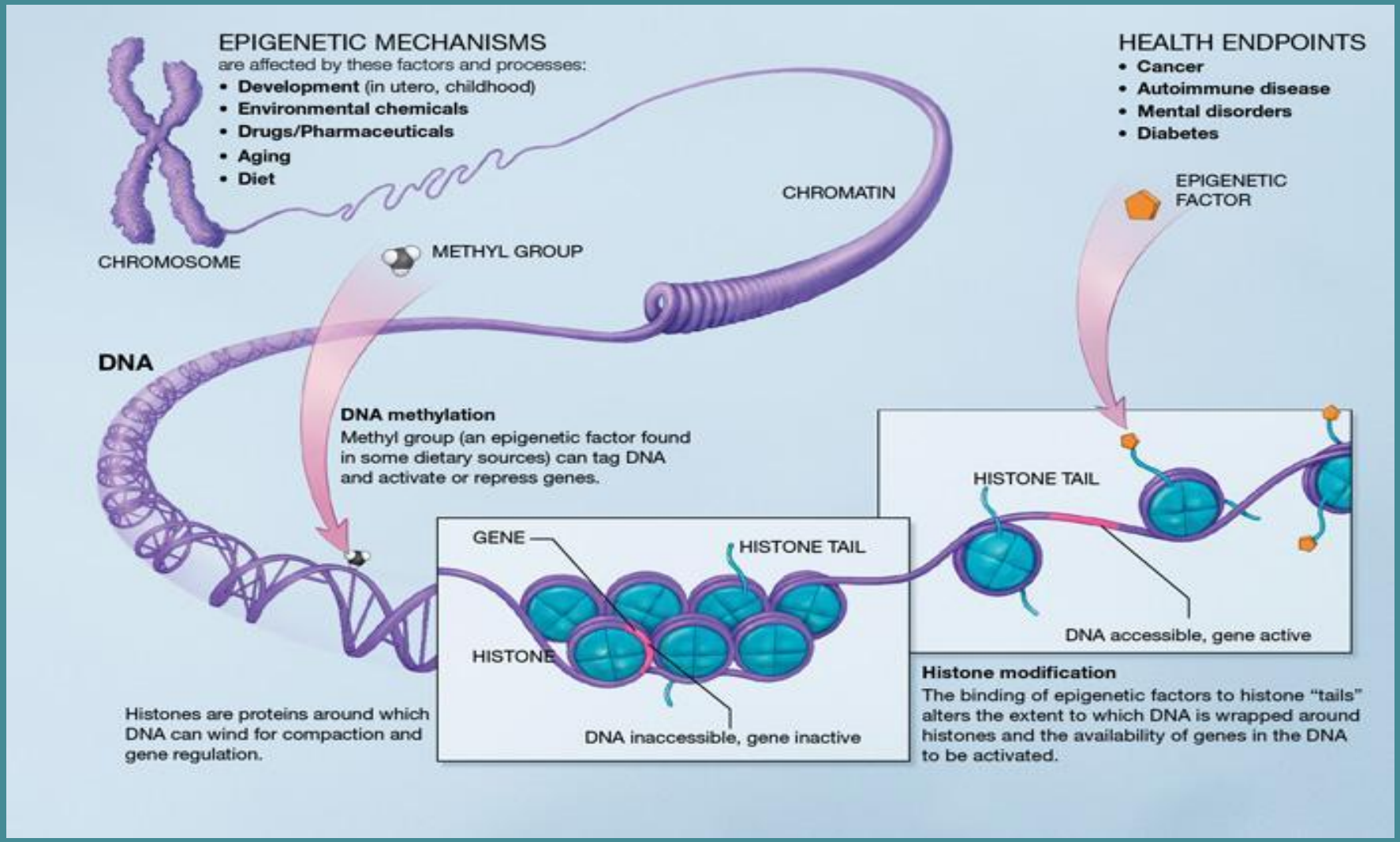
Cells and Their Energy Factories



Free Radical Damage



Epigenetics



Epigenetics in Gene Expression

- Histones are proteins wrapped tightly into ball like shapes with floppy tails
- Acetylation of histones allows transcription—unwrapping genes for expression
- Methylation of histones keeps them in place—suppressing gene expression

Someone Needs to Play (behave)

Epigenetics and Decreased Stress

- Decreased methylation levels of cortisol receptor gene:
  - In offspring who had good nurturing produces more cortisol receptors on the hippocampus
    - Lower levels of CRH, ACTH, and cortisol
    - More 5-HT
    - Stress tolerance (Good thermostat)

Affect Asymmetry

Set points

Left Hemisphere

Positive emotions
Approach behaviors
Feeling engaged

Right Hemisphere

Negative emotions
Withdrawal and Avoidance
Feeling overwhelmed

Two LT Memory Systems

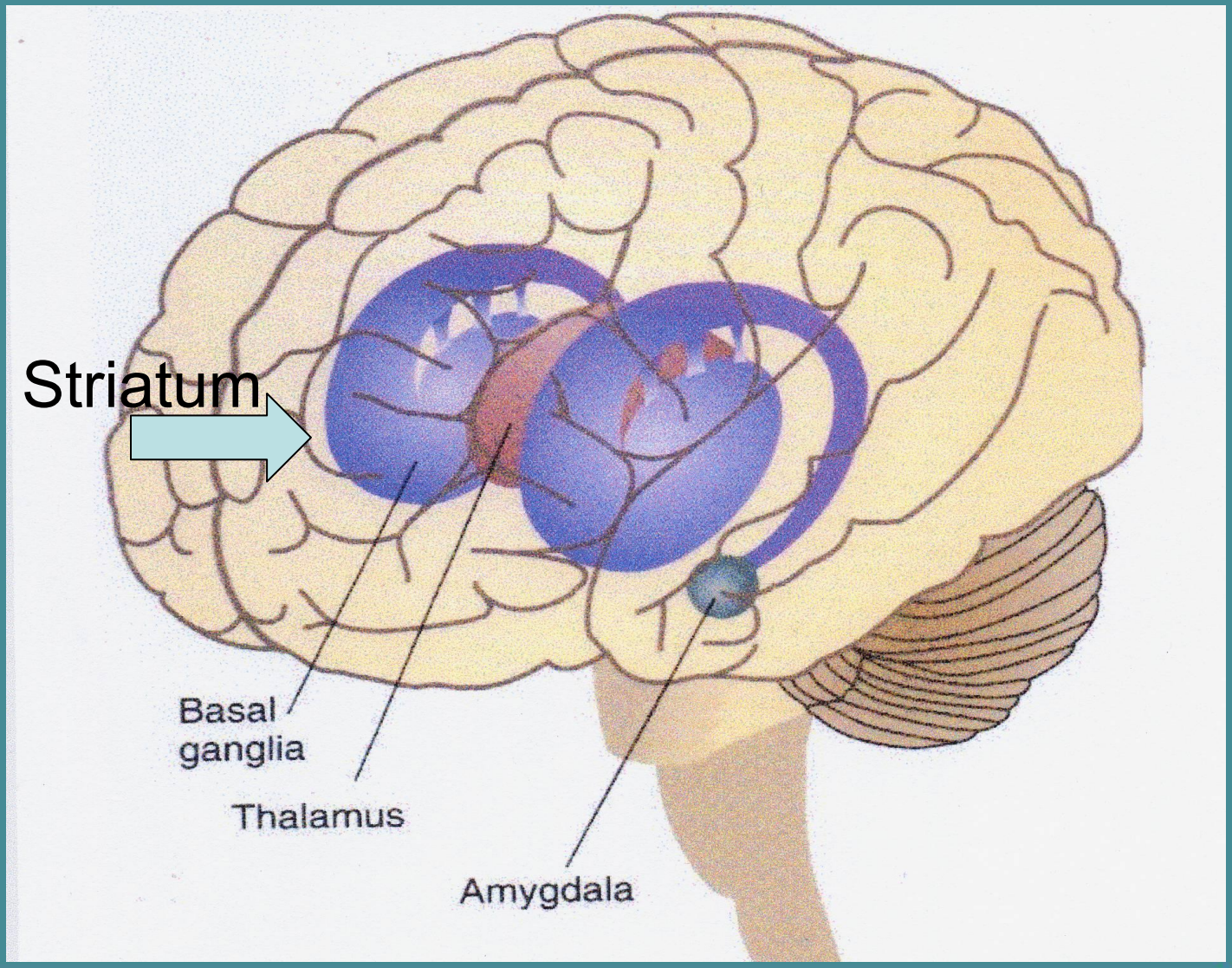
Implicit	Explicit
Non-declarative	Declarative
• Procedural • Emotional • Generalized • Classical conditioning	• Episodic • Autobiographical • Semantic • Context Specific
Amygdala and BG-driven	Hippocampus-driven


EXPLICIT DECLARATIVE KNOWLEDGE
IMPLICIT PROCEDURAL KNOWLEDGE

Client Education

- You possess different types of memory, some for feeling states, sensations, movement, and some for thinking about and describing events.
- Sometimes these memory systems get out of sync with each other, which can cause psychological problems.

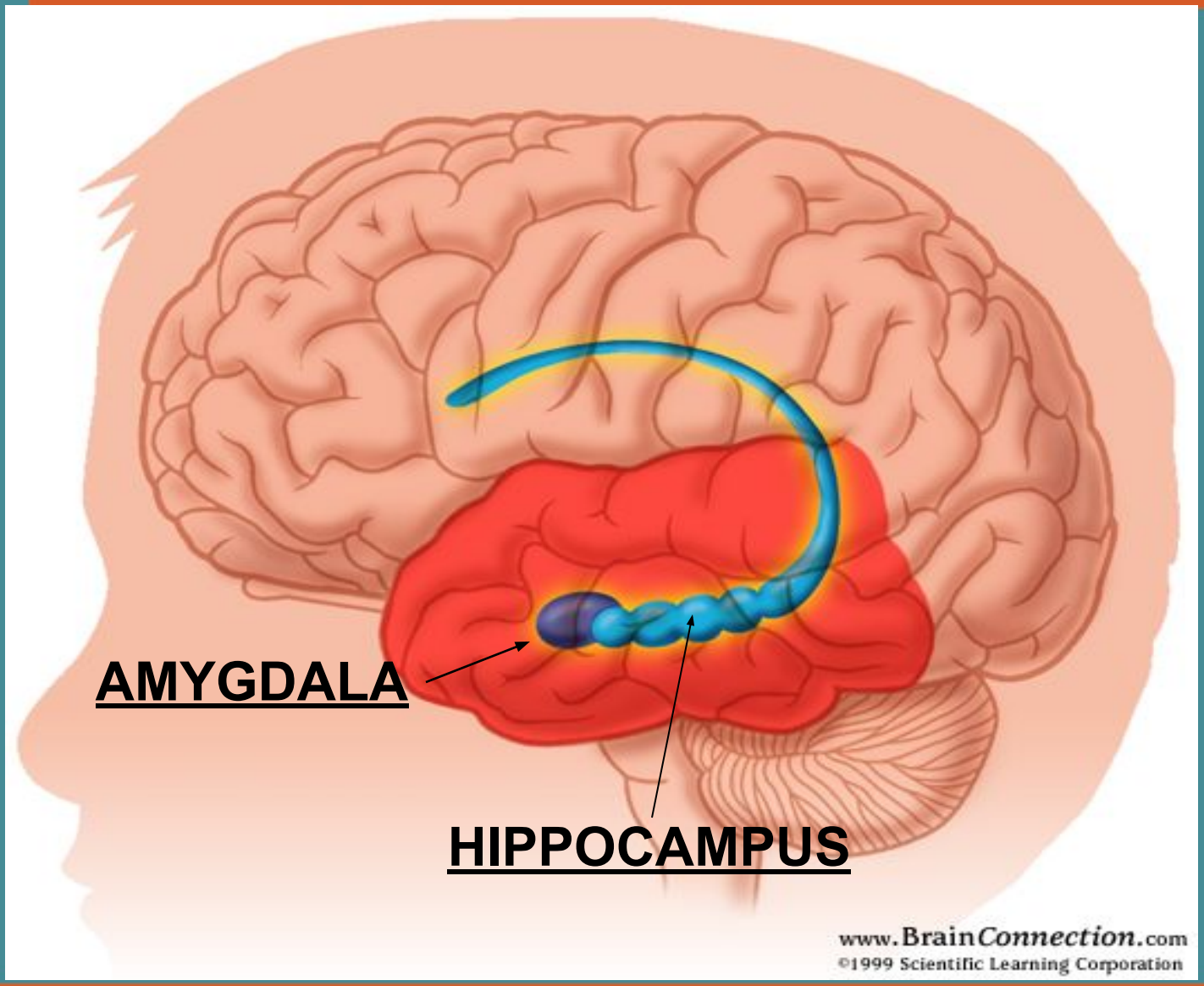
The Habit Circuits



Procedural Memory

Client Education

- Let's work together to rewire your memory systems so that you won't do more things out of habit that you regret.
- This will require some initial discomfort but those feelings will pass as we build in circuits that will provide you with positive feelings.


AMYGDALA
HIPPOCAMPUS
www.BrainConnection.com
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Amygdala

- A **relevance detector**
- Retains motivational value of events
- Orchestrates a wide range of physiological reactions---**triggers the release of epinephrine and norepinephrine ("fight, flight, or freeze")**
  - **And the second phase—the HPA axis response and release of cortisol**
- Aids in the facilitation of attention toward emotionally significant stimuli (Vuilleumier, 2009)

The Role of the Hippocampus

- Needed temporarily to bind together distributed sites in neocortex that together represent a whole memory
- Index to database of memory
- Novelty detector: compares incoming info to stored knowledge; if different, triggers dopamine increase
- Specialty is binding new to old information
- Gradually goes on-line at around 3 years old.

AMYGDALA
Implicit Memory System

- Fear Conditioning
- Emotional Valance
- Generalized
- Cortisol Heightened
- Sensitivity
- (Hypervigilence)
- Matures Early
- "Little Albert"
- "LSMFT"

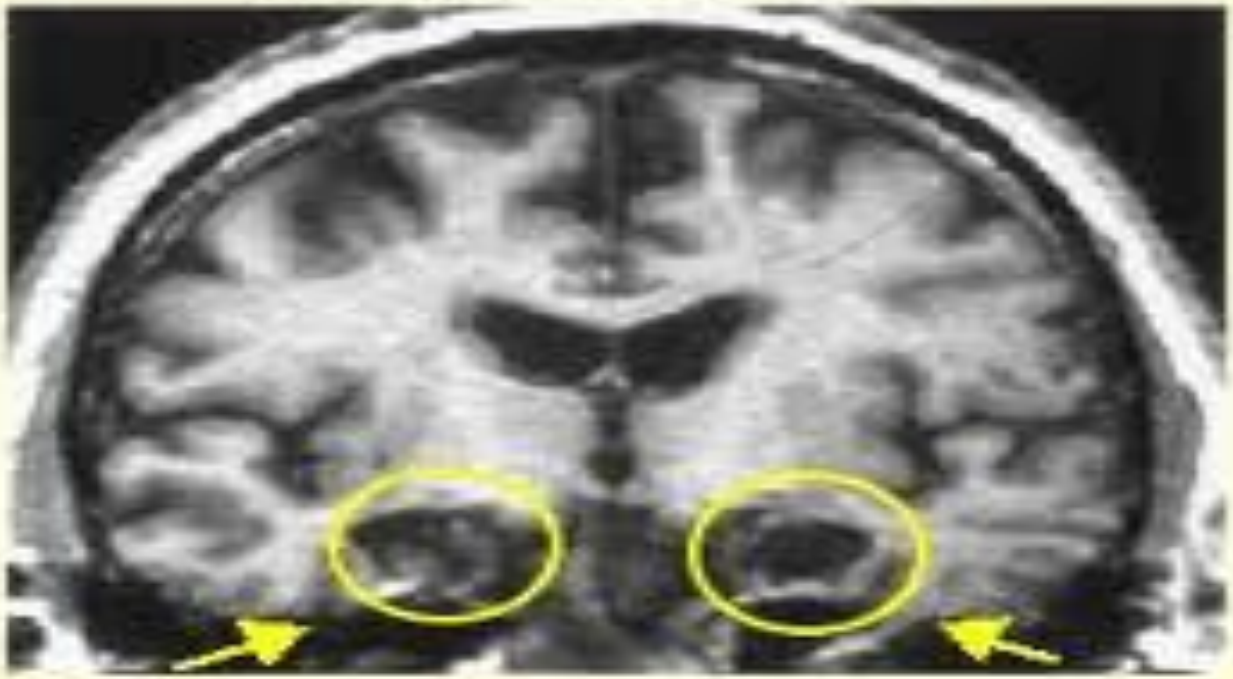
HIPPOCAMPUS
Explicit Memory System

- Many Cortisol Receptors
- Context Specific
- Heightened Cortisol leads to atrophy
- Matures Later
  - Vs. Infantile Amnesia
- "H.M."

Henry Molaison

Dr. Brenda Milner

Henry's Brain



Client Education

- The part of your brain that codes in information to long-term memory does not go on-line at least until age 3 or 4.
- This means you cannot go back to capture accurate memories that were never encoded.

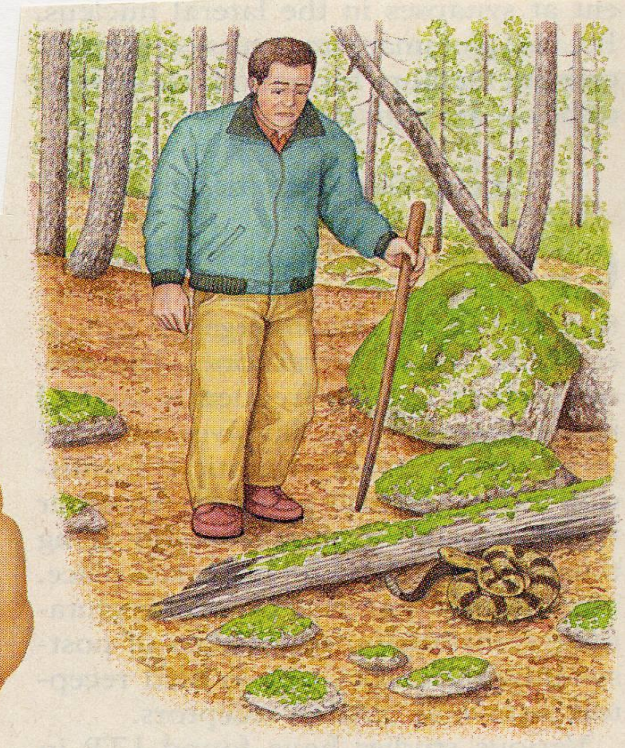
Amygdala and Hippocampus

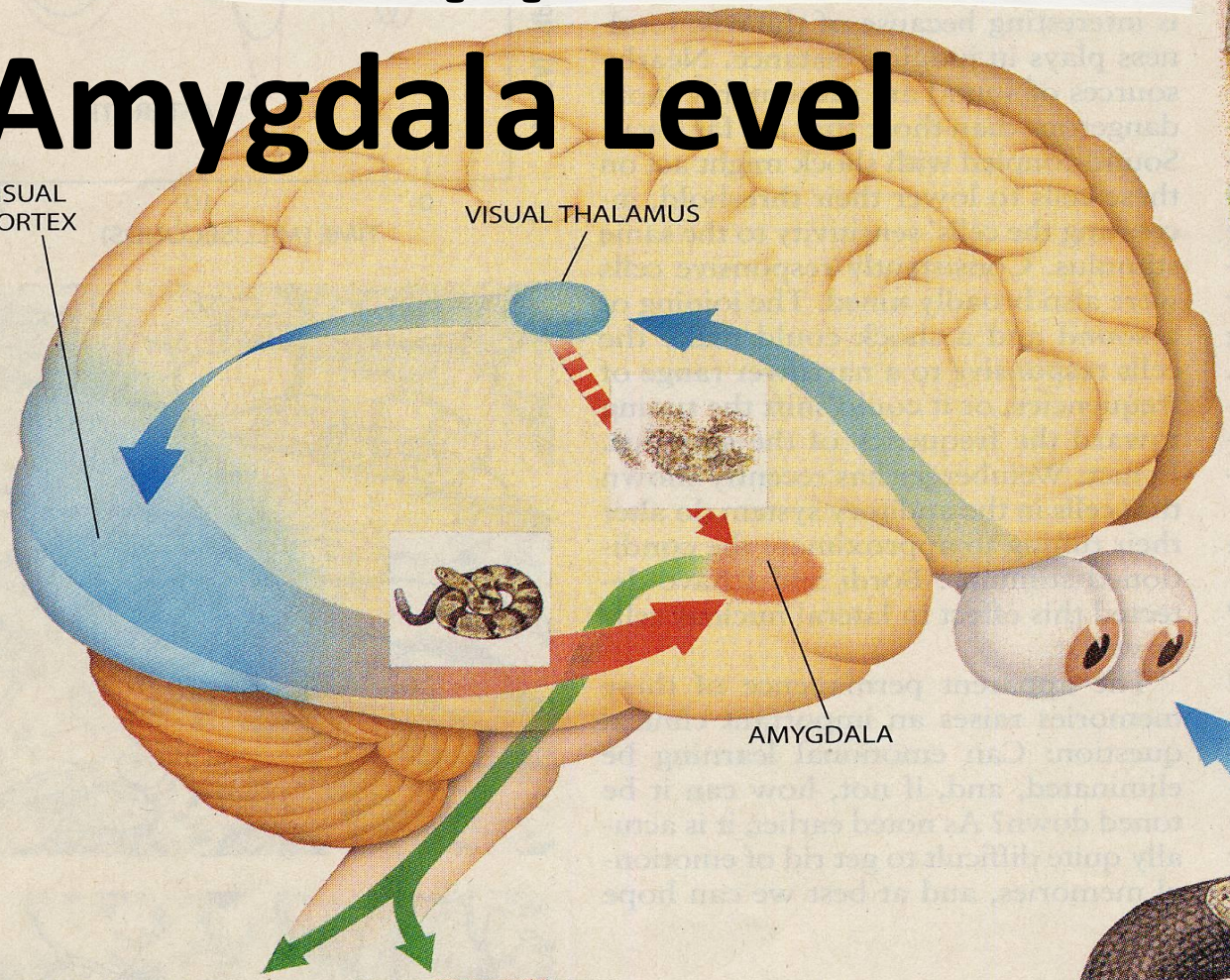
- Amygdala contributes to emotional amplification of explicit memories
- Explicit memories can be state-based (e.g., when we are depressed, we remember depressing events)
- When the amygdala and hippocampus are activated together memories are more robust and durable
  - Make what you want the client to remember emotionally relevant

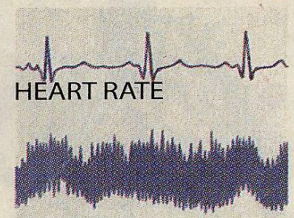
Client Education

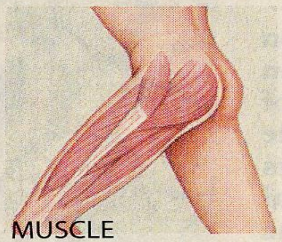
- Your emotional state influences your recall and ability to apply new skills.
- Practice new skills in the mood and optimistic perspective we have talked about.

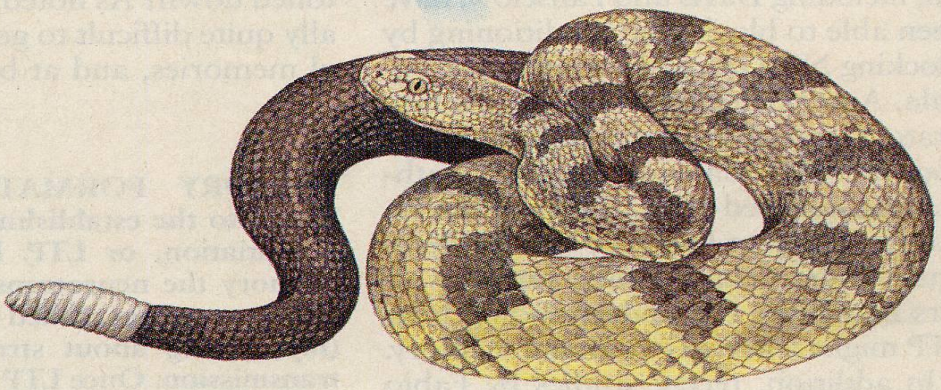
Threat Appraisal: Amygdala Level











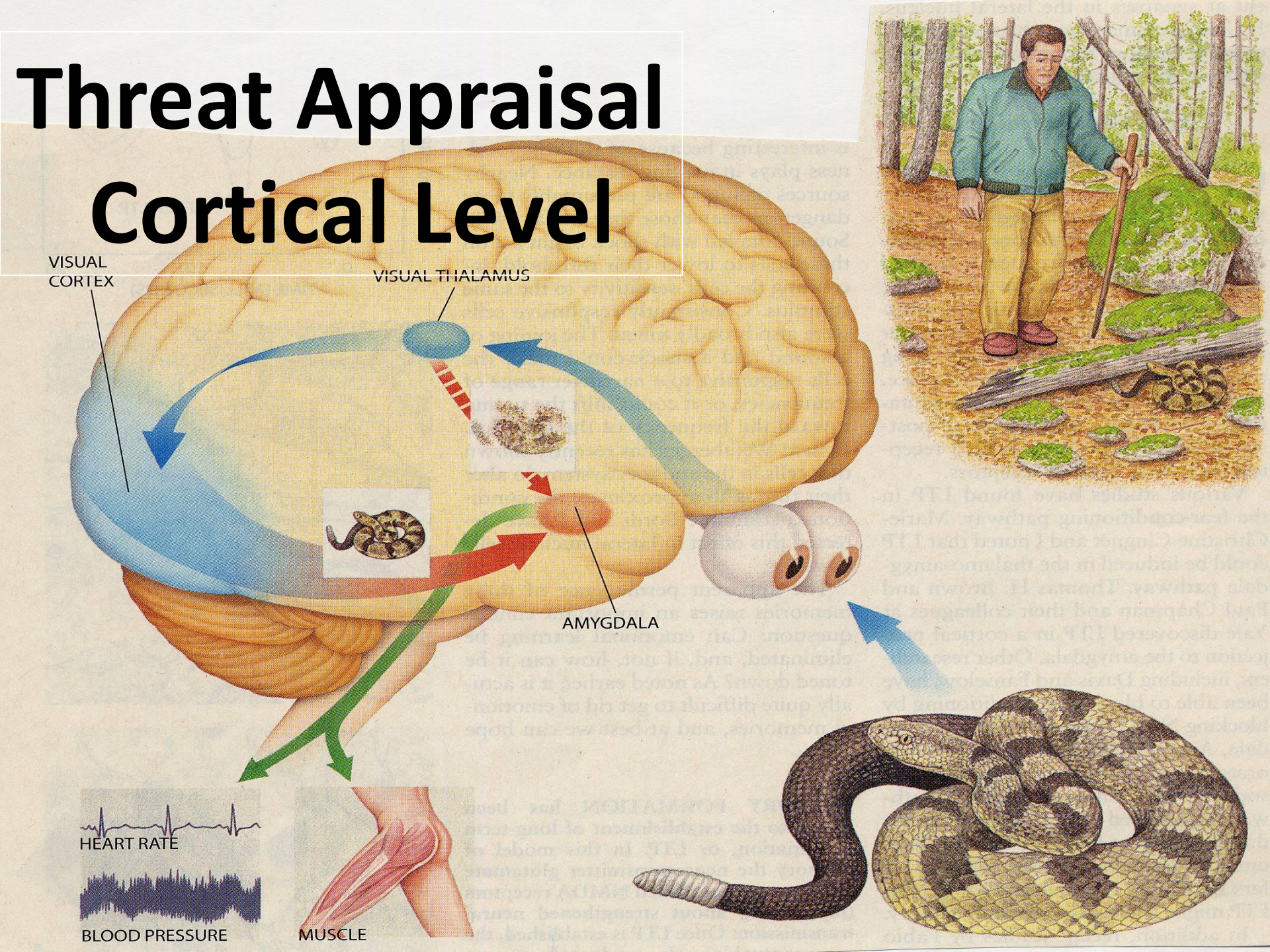
The Fast Circuit to the Amygdala

- Sensory info goes to the Thalamus then directly to the Amygdala:
- Fight or Flight: SNS and HPA activation
- Emotional Learning
- Fear Conditioning
- PTSD, panic, etc.
- Flashbacks
- “Bottom up”

The Fast Track to Survival

- Rapid, crude, adaptive, and immediate
- Cannot reality test
- Prone to false alarms

Threat Appraisal Cortical Level



The Slow Circuit to the Amygdala

Sensory info goes to the Thalamus through the Cortex and Hippocampus to the Amygdala

Limitations:

- Worries and GAD
- Fears and Phobias

Benefits:

- Tames the Amygdala
- With exposure, New Thinking (cortex)

"Top down"

Client Education

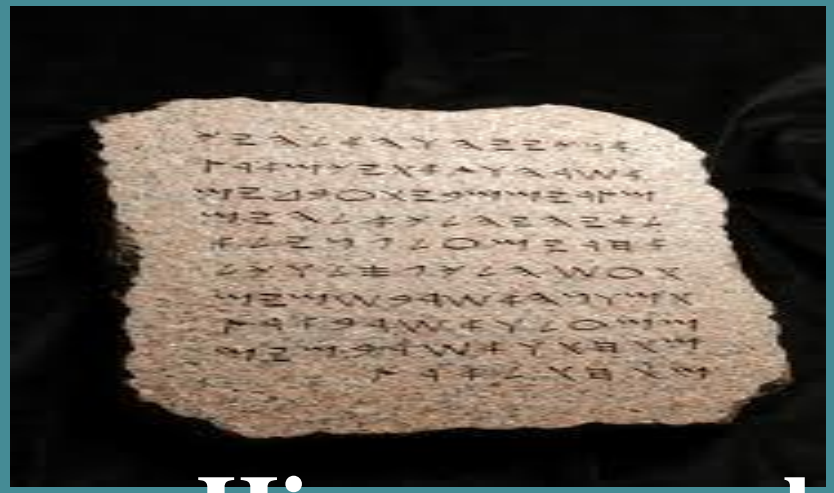
- Anxiety occurs when your fast track is on too often and your slow track needs to speed up.
- Let's work together to slow down your fast track and speed up your slow track.

Client Education

- When you are immediately frightened then find out that there is no danger, that's a clue that you need to teach your slow track to catch up with your fast track.

The Dynamics of Fear

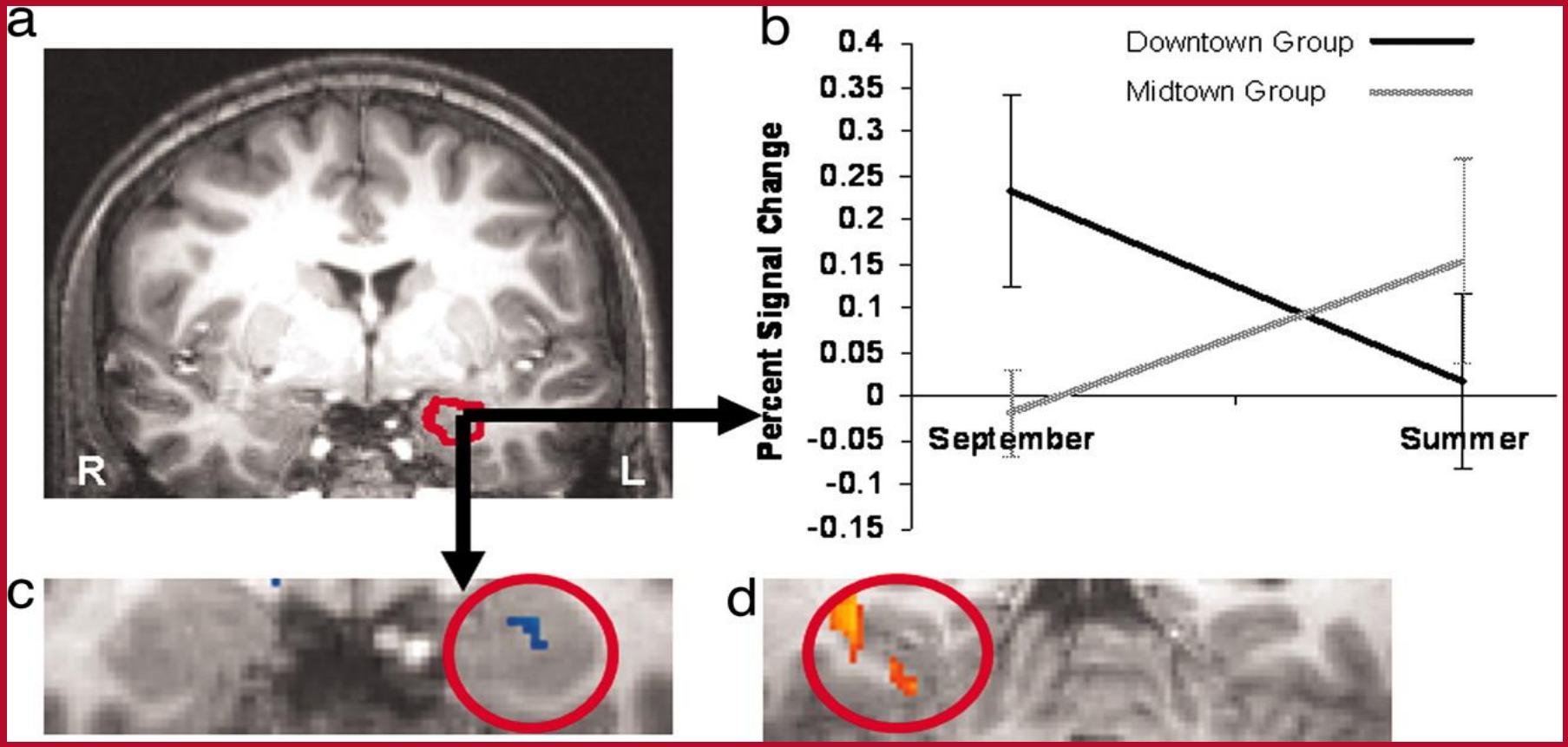
- Amygdala memories are hard to forget ("Stone tablet")



- Hippocampal circuits tell us what to fear and in what context ("Etch-a-Sketch")

The Amygdala and Traumatic Memories

- Participants who were closer to the WTC showed decreased activation in the posterior parahippocampal cortex and increased activation in the amygdala bilaterally during retrieval of 9/11 memories relative to summer memories.



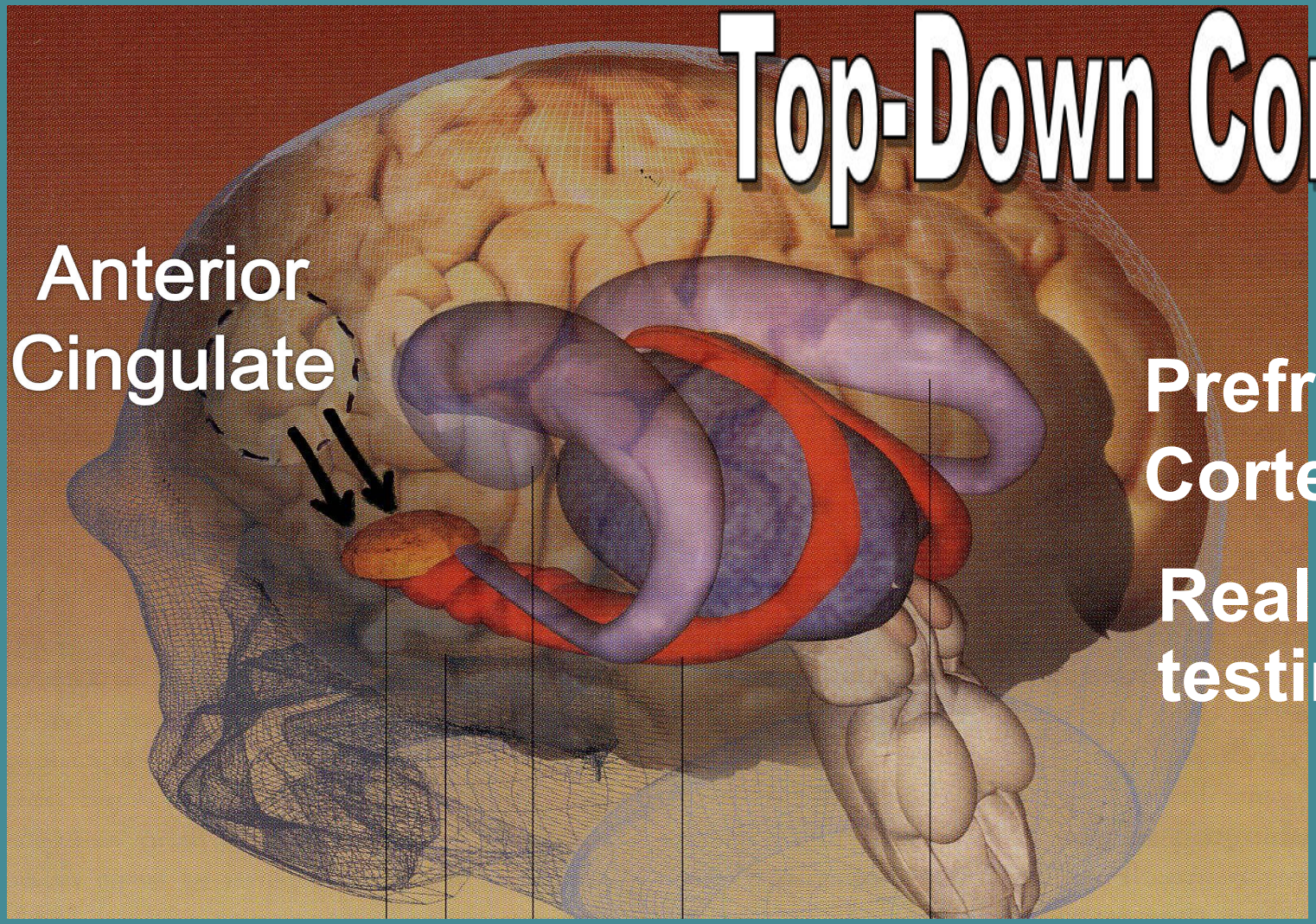
Flashbulb Memories

- A particular type, not class
- During emotional peaks, NE dramatically sensitizes synapses
  - Primes neurons by increasing their sensitivity

Negative Memories

- Fear and negative emotion narrows attention to threat:
  - **–"weapons focus"**
- Thus, less accuracy for peripheral memory of stimuli (i.e. color of a car or person's hair) more to the object of threat (gun, knife, etc.)

Cortical-level Appraisal



The Snake Temple—Top Down Control?

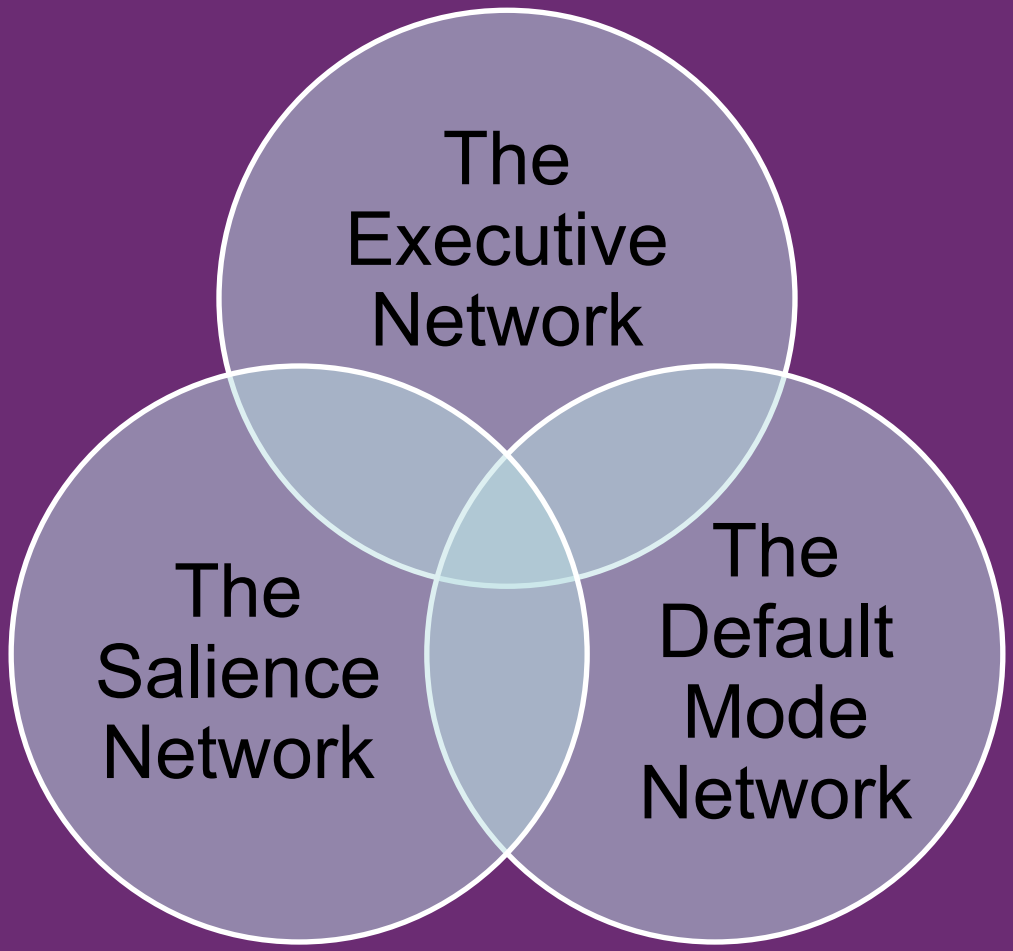
Risk Factors for PTSD

- Greater distress before/after the trauma
- Poverty and low socioeconomic status
- Previous or current psychiatric disorder and poor affect regulation
- Family discord and/or insecure attachment
- Cognitive disengagement at the time of the trauma and dissociation involving depersonalization and derealization
  - Especially with early and repeated trauma

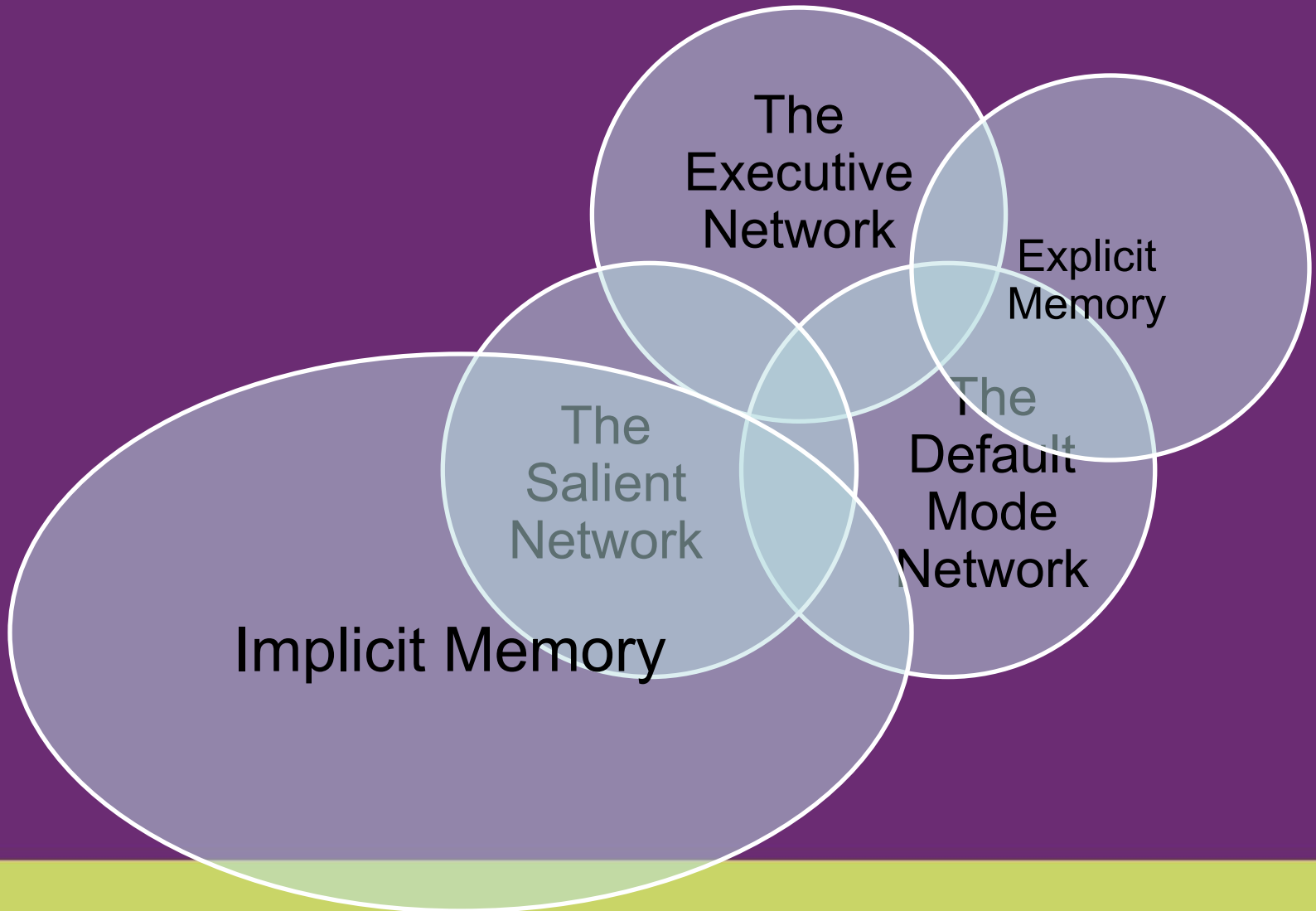
The Mind's Operating Networks:

- **Salience Network:**
- the material "me"
- emotional and reward saliency;
- **Default Mode Network:**
- mind-wandering; fantasying, ruminating
- mentalizing, projecting to the future or past;
- **Central Executive Network:**
- moment to moment monitoring of experience
- selection, planning, toward goals;

Balancing the Mental Networks



The Mental Neworks & the Long-Term Memory Systems

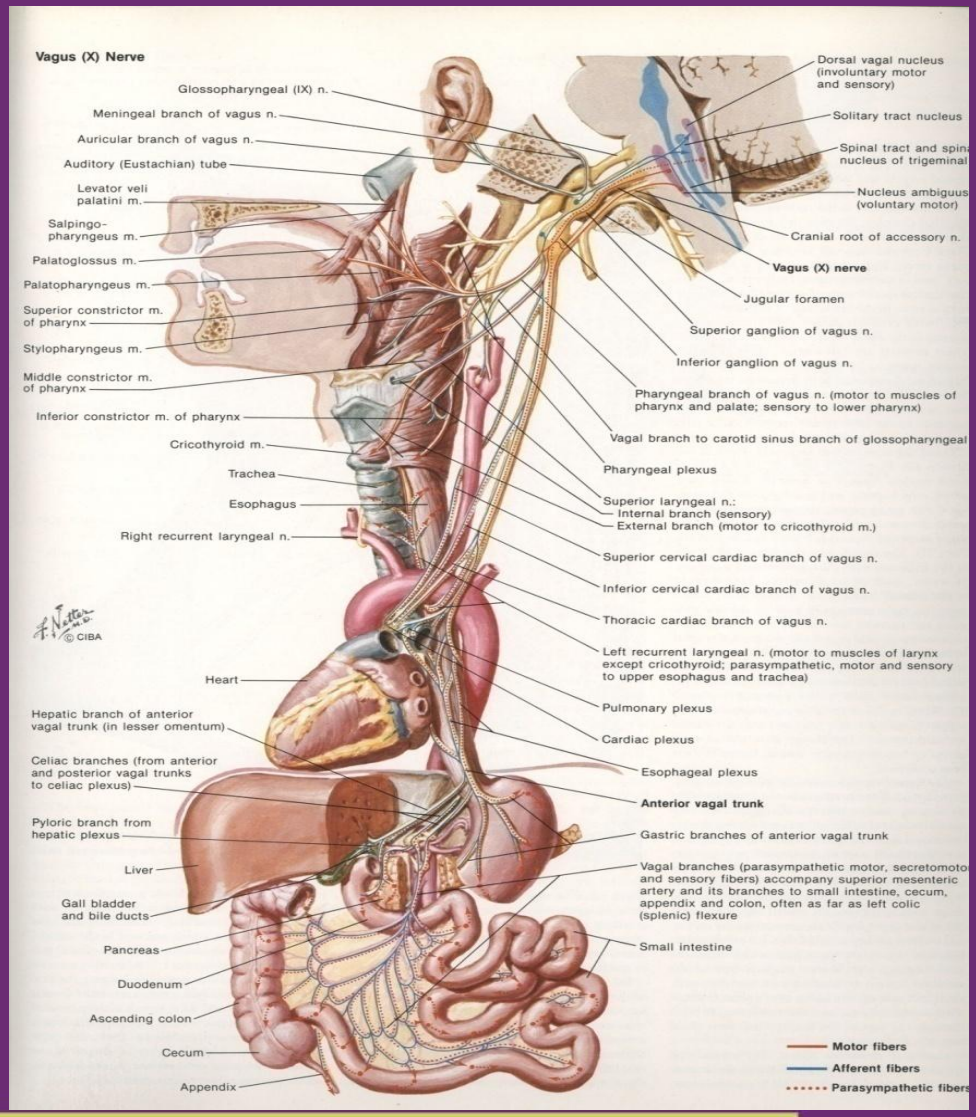


Trauma & Salience Network:

- Pulls in implicit memories-
  - i.e. via, amygdala threat detection
- Emotional (anxious)
- bottom-up body sensations (panic)

The Vagus Nerve System

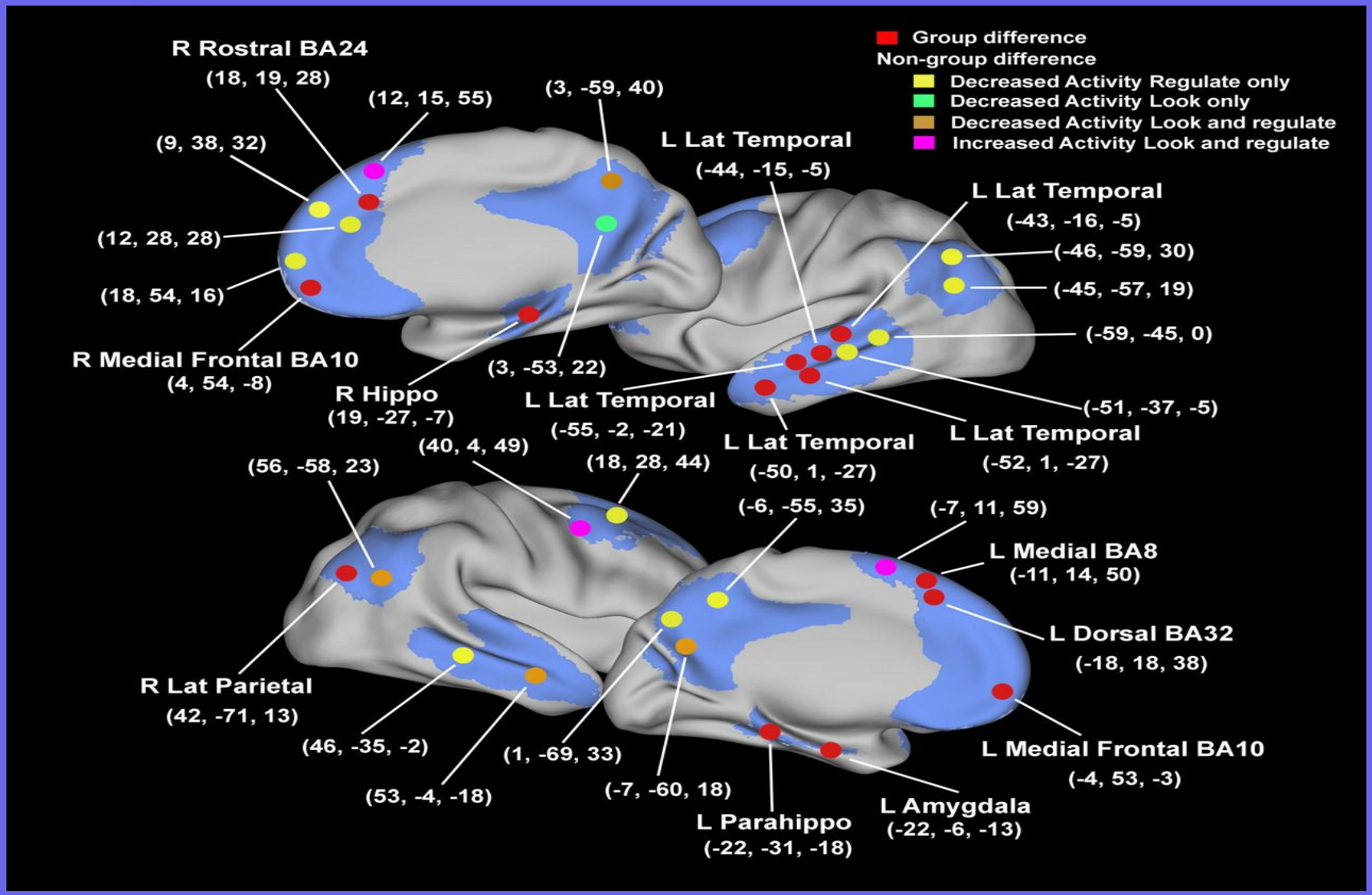
- Tenth Cranial Nerve --a complex of sensory and motor nerve fibers.
- *Vagal tone*- the ability to modulate target organs without sympathetic arousal
- allows attachment and sustained relationships.



Trauma & Default Mode Network:

- Ruminations about the incident(s);
  - "My life is ruined
- Reflecting on how it could have been avoided
- mistrust when reflecting on social relationships;

Activity in the default mode network



Sheline Y I et al. (2009)

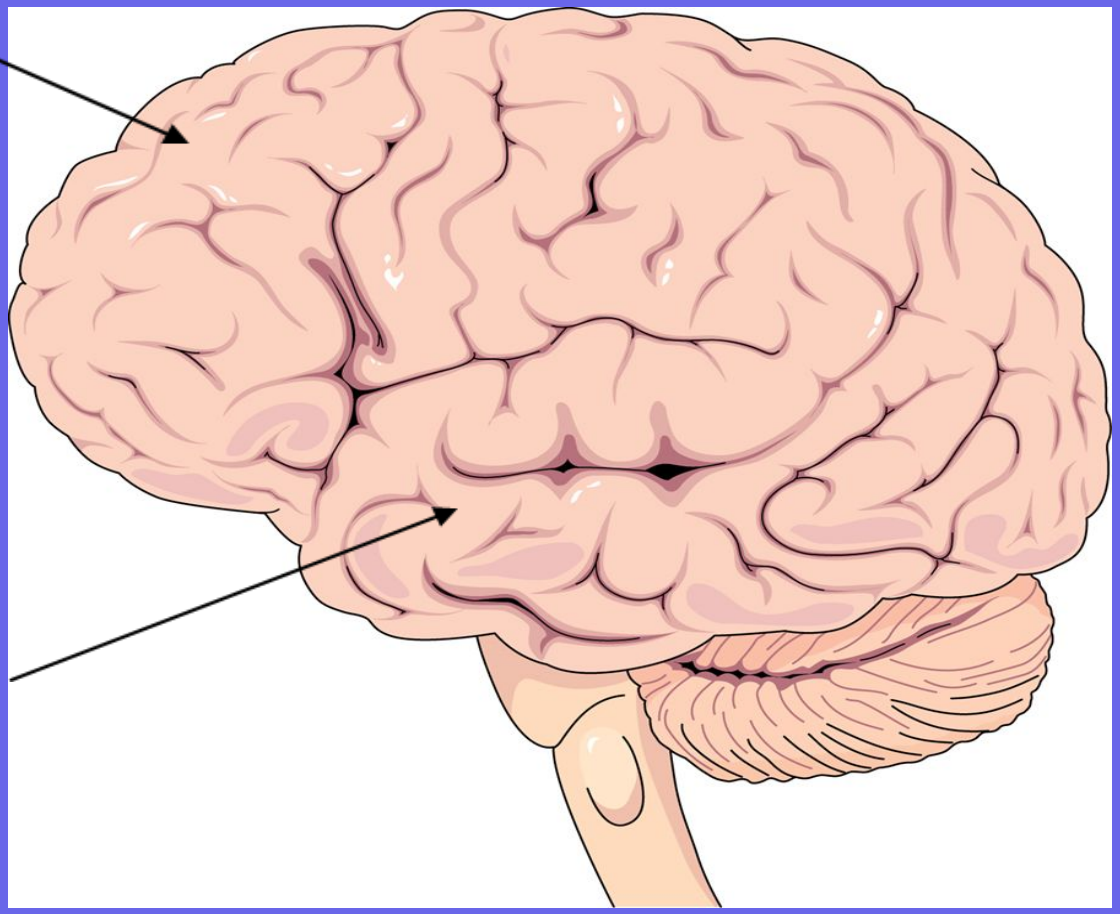
Trauma & Executive Network:

- Hyper vigilance
- Distracted by sensations
- Impaired working memory
- Neurophysiological pathology
  - (i.e hippocampus and DLPFC)

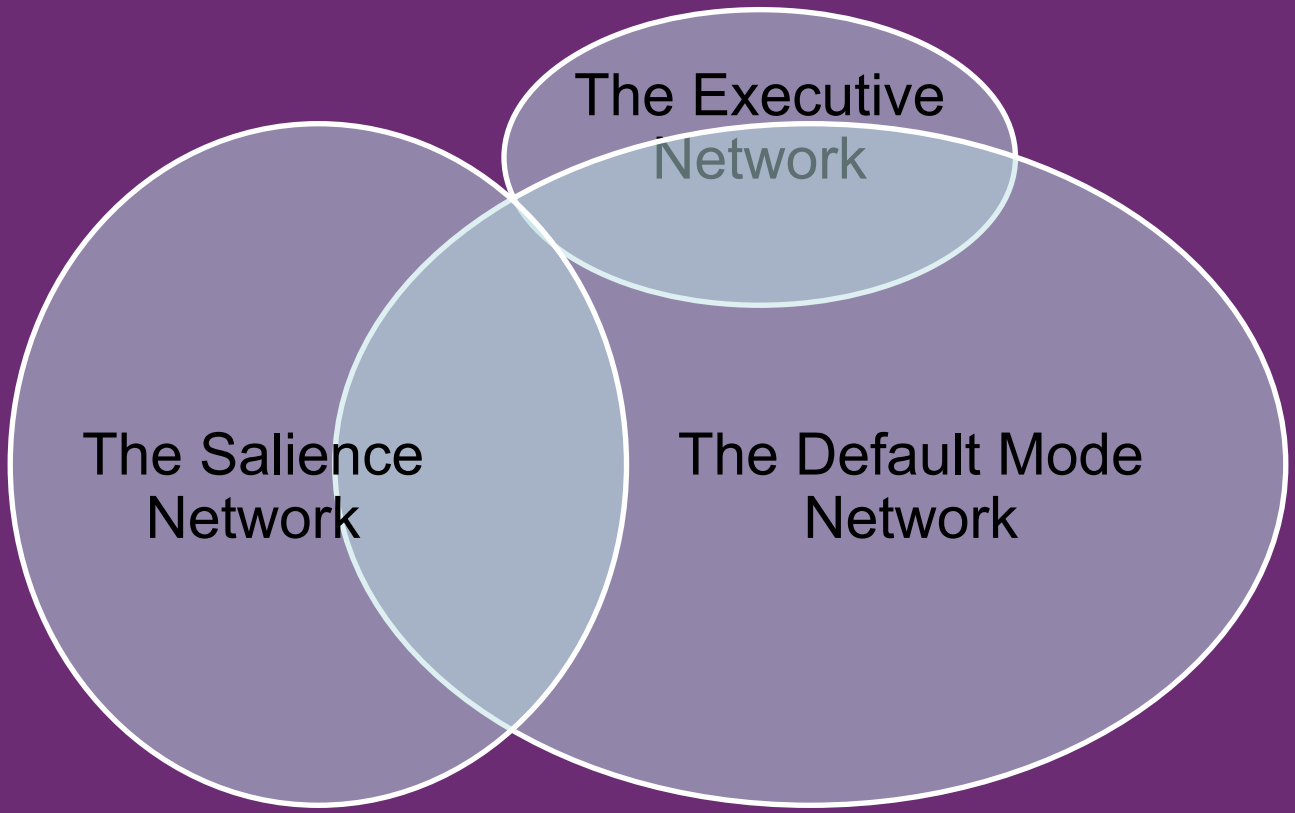
DLPFC and Hippocampus

Dorsolateral Prefrontal Cortex

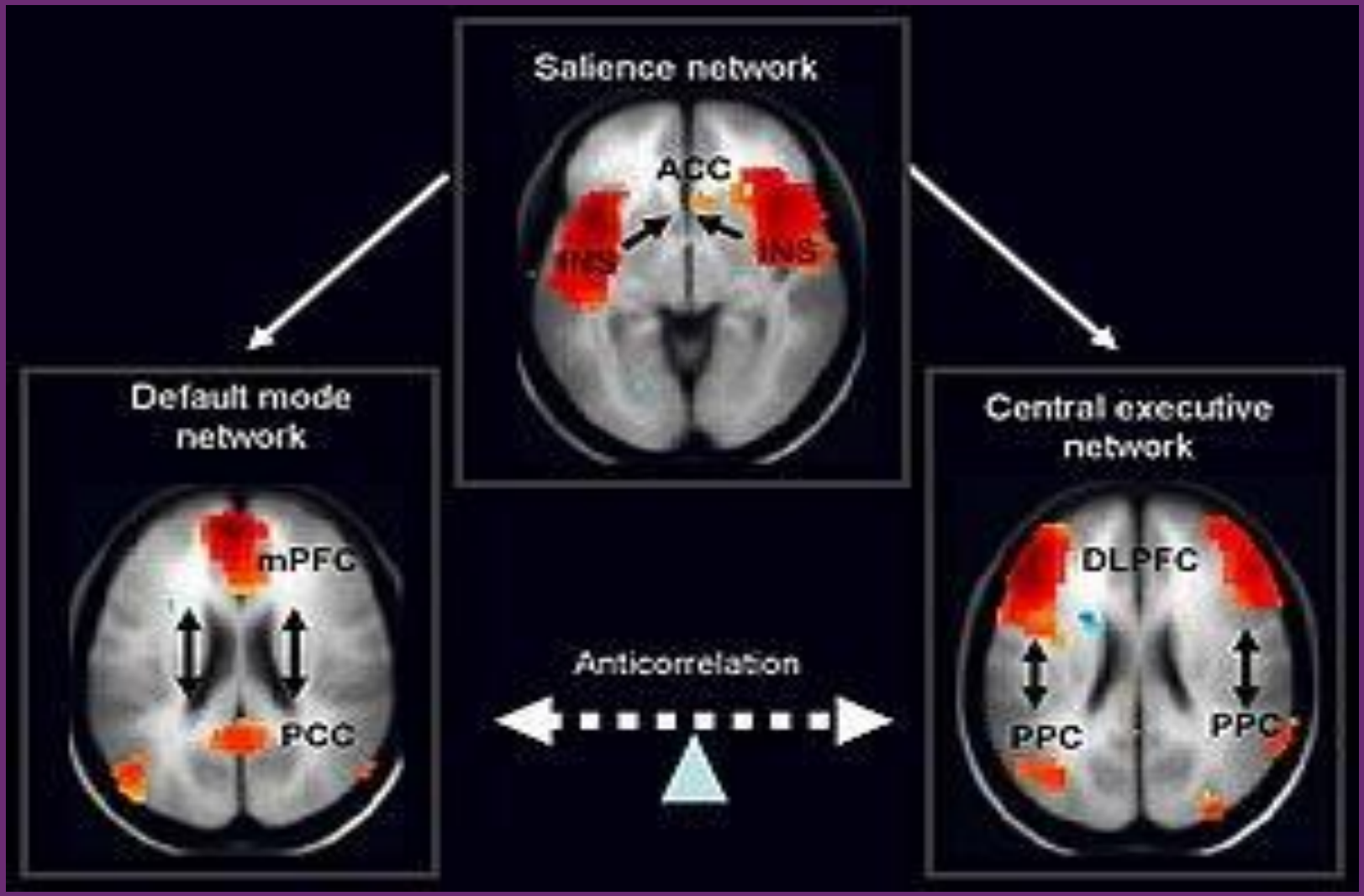
hippocampus



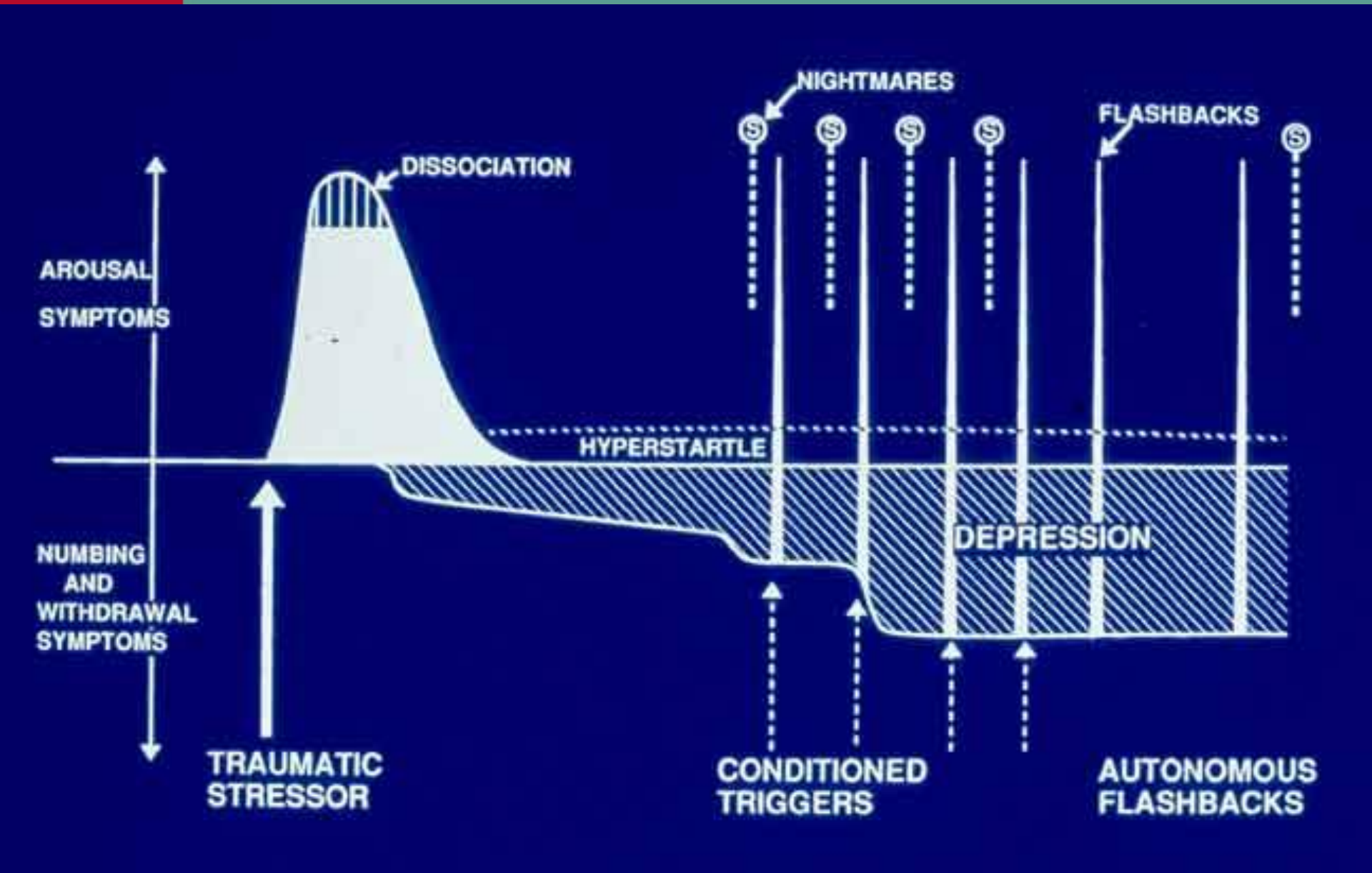
Imbalanced Mental Networks



The Mental Neworks



Time Sequence



Neurochemical Dysregulations

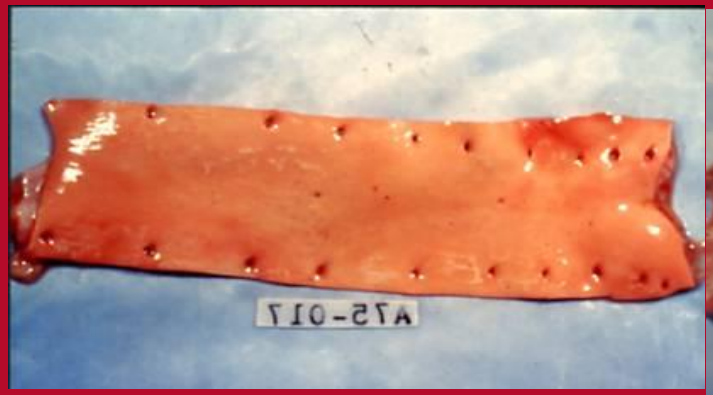
- Decreased serotonin
- Hypocortisol
- Increased cortisol
- Increased proinflammatory cytokines
- Decreased opioids
- Decreased GABA
- Decreased BDNF

PTSD Neurodynamic Aspects

- ↑ amygdala—general false positives for threat
- ↓ mPFC especially the ACC (reduced neurointegration and cortical volumes) (De Bellis, et. al., 2000) (inadequate top down inhibition of the amygdala)
- ↓ hippocampus (cortisol, excitotoxity, blocking of neurogenesis)

Excessive Cortisol

- **Causes: Extremely severe, prolonged, and inescapable stress. (perceived lack of control)** **Hypercortisolemia and damage to arteries**



Cortisol Cascade Model

- Stress causes over-production of cortisol
- Excessive cortisol causes dendrites in the hippocampus to shrivel up (Sapolsky, 1996)
  - PTSD patients with smaller hippocampi (Bremner, 1999)
- This feedforward loop leads to heightened reactivity of amygdala
- The hippocampus is essential for turning off HPA axis and damage to it leads to even more cortisol release as time passes

Hippocampal atrophy

PTSD Vulnerability

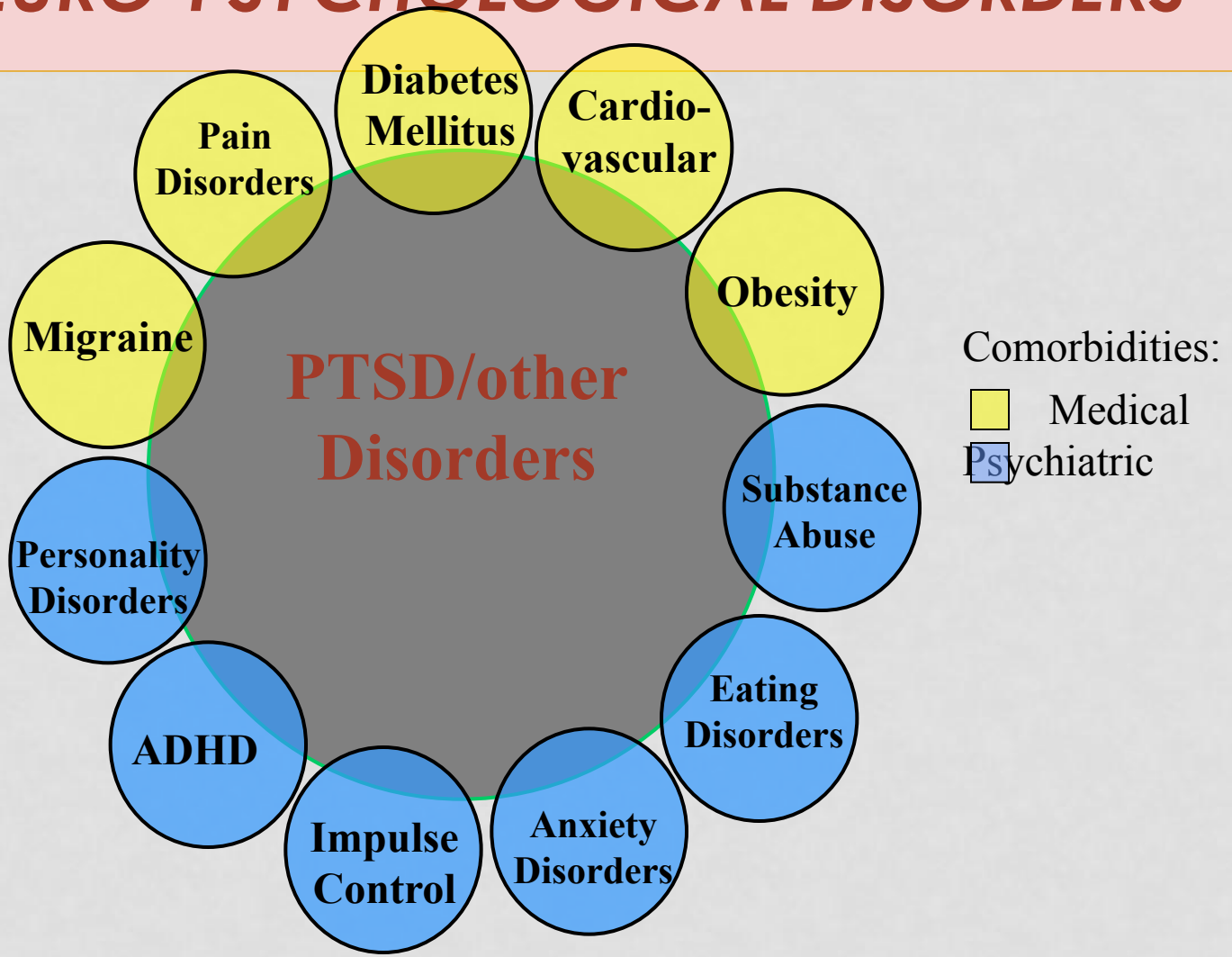
- Monozygotic twin brothers, one with combat related PTSD and the other who never went to war. Both had smaller hippocampal volumes. – Thus, the vulnerability hypothesis may be viable as a possible *partial* explanation for risk.

- It appears that *both* smaller hippocampus increases vulnerability and the cortisol-cascade shrinks hippocampi. (Gilbertson, et al, 2002)

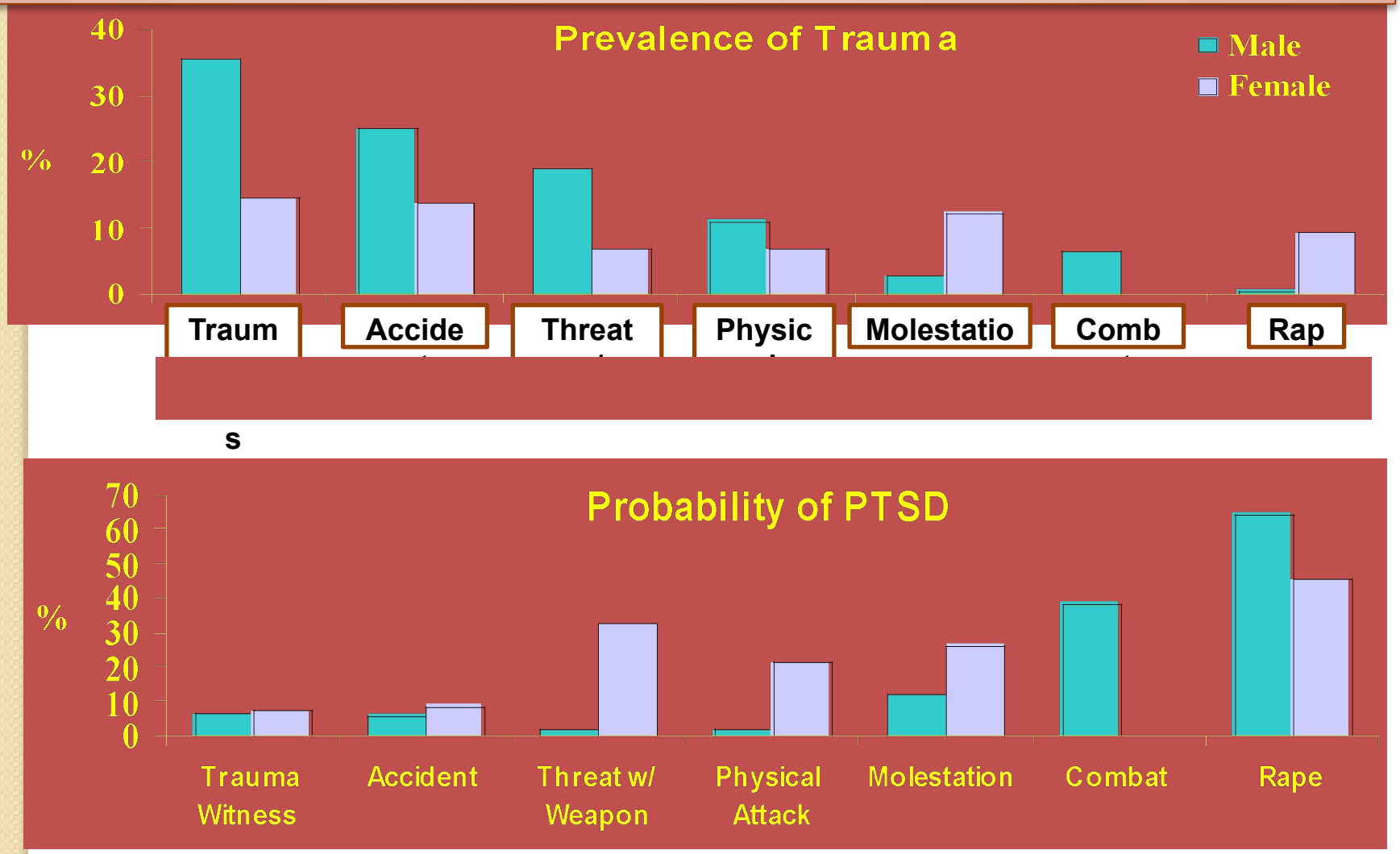
Possible Neurochemical Vulnerability of PTSD

- ↑ NE post trauma may predict PTSD (Yehuda, et. al., 1998)
- ↑ cortisol in the evening not in the morning
- ↑ proinflammatory cytokines post trauma
  - The secretion of IL-6 inflammatory cytokines can be triggered by B-adrenergic receptors with ↑ NE
  - Inflammation can occur post trauma via CRH/substance P-histamine axis with ↑ cortisol and IL-6 (Elenkov, et. al., 2005)

THE RULE NOT THE EXCEPTION
THE MULTIDIMENSIONALITY OF NEURO-PSYCHOLOGICAL DISORDERS



Prevalence of Trauma and Probability of PTSD



Kessler. *J Clin Psychiatry*. 2000;61(suppl 5):4.
Kessler et al. *Arch Gen Psychiatry*. 1995;52:1048.

Phylogenetic Responses to Stress

- 1) Trigger the social engagement system—the myelinated vagus
- 2) Fight or flight—SNS and HPA axis arousal
- 3) Immobilization—freeze, collapse, and feigned death:
  - 2 stages
    - Freezing in terror
    - Paralyzed—shut down—total submission, trancelike, dissociation

Continuum of Detachment

- Traumatized people can experience:
  - Mild detachment or absorption: involving a breakdown in the ability to notice outside events and extending to an altered sense of self.
  - Moderate detachment: involving feelings of depersonalization and derealization. The person sees himself as if from afar as an observer.
  - Extreme detachment: involving a state of unresponsiveness. The person can act catatonic and have no sense of self or time. (Allen, 2001)

Dissociative Disorders

- Depersonalization/Derealization disorders + persistent or reoccurring experiences of unreality from mind, self, body, and/or surroundings
- Dissociative amnesia – psychogenic inability to recall autobiographical info.
  Specifier—dissociative
- Dissociative identity disorder (DID)—2 or more personalities with reoccurring memory “gaps” (episodes of amnesia can include possession)

Dissociative Dynamics

- Because the development of a coherent and durable requires safety and positive attachment to the principle care givers, attention can be focused on internal awareness and introspection
- When interpersonal environment is dangerous hypervigilance and attention is drawn outward away from the development of a coherent self-system
  - Attention inward could be punished
  - Internal representations could be fragmented

"Identity training" from Dissociation

- Therapy entails helping the client build a coherent and positive model of the self (much like parents should have help promote)
  - Facilitating self-exploration and self-reference
  - Helping the client identify, label, accept feelings , and needs
  - Development of a coherent internal life and self-determination

PTSD Therapy Goals

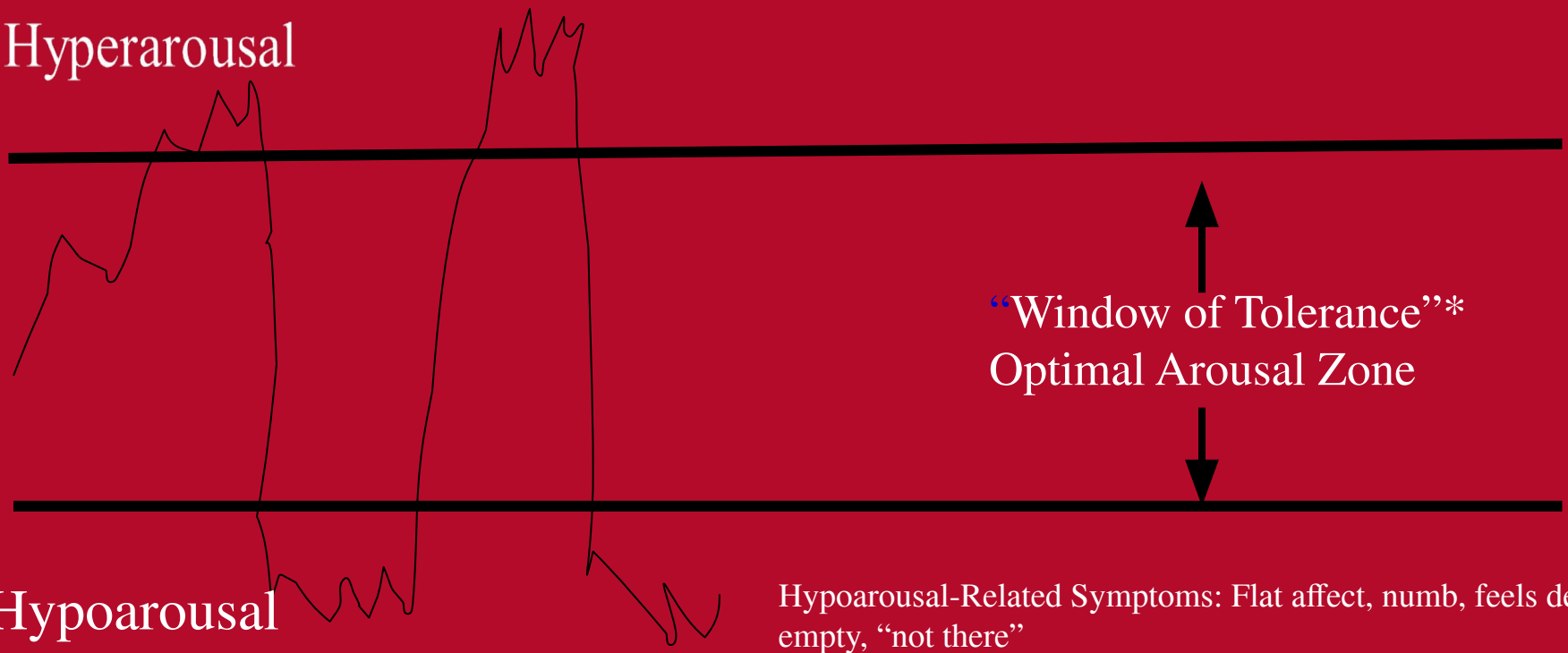
- Too early exposure heightens the cascade of stress hormones and neurotransmitters:
  - increases the reactivity of the amygdala when it's already overactive.
  - the hippocampus then encodes more of the traumatic memory
  - The person needs a healthy hippocampus later to reconstruct a more accurate and durable version of the experience.

Therapy Goals

- Reducing the person's immediate distress
- Preventing PTSD (i.e. ASD to PTSD)
- Promoting emotional processing through ventilation and normalization
- Preparing for future experiences
- Avoiding premature diagnostic labeling
- Providing education about stress, coping with stress, and opportunities for future treatment (Mitchell and Everly, 2000)

Trauma Responses are Autonomically Driven

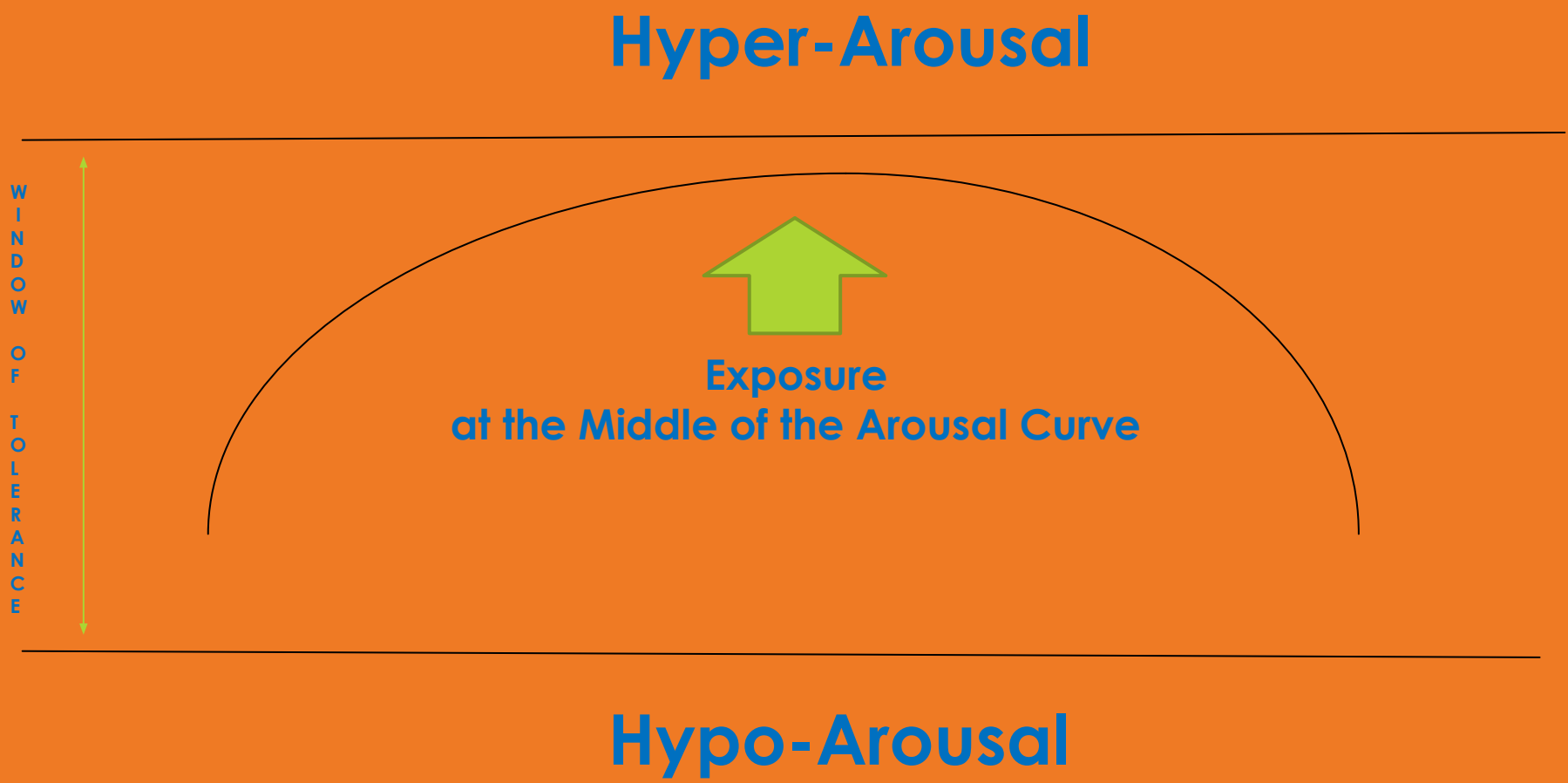
Hyperarousal-Related Symptoms:
High activation resulting in impulsivity, risk-taking, poor judgment
Chronic hypervigilance, post-traumatic paranoia, chronic dread
Intrusive emotions and images, flashbacks, nightmares, racing thoughts
Obsessive thoughts and behavior, cognitive schemas focused on worthlessness and dread



Hypoarousal-Related Symptoms: Flat affect, numb, feels dead or empty, "not there"
Cognitively dissociated, slowed thinking process
Cognitive schemas focused on hopelessness

Client Education

- Though your memory may be temporarily impaired, you can revitalize these areas of your brain by aerobic exercise followed by learning and goal oriented behaviors.


Hyper-Arousal
WINDOW OF TOLERANCE
Exposure
at the Middle of the Arousal Curve
Hypo-Arousal

Client Education

- Having suffered traumatic stress can make your brain tend to focus only on the memory of the trauma.
- As we work together your brain will normalize and the traumatic memories will fade into the background.

Exposure

- Imaginal exposure (trauma memory)
  - Exposes client to memory of the trauma in structured, controlled way
  - Trauma exposure helps client in two ways:
    - Helps client organize memory into coherent narrative (calms overactive amygdala)
  - Generally need minimum of 12 sessions (CBT, PE, CPT)
    - CBT approach starts with psychoeducation, anxiety management, and coping skills
    - Cognitive processing of trauma memory & associated meaning (beliefs)
- Situational exposure (CBT & PE)
  - targets avoidance of trauma-related situations (and agoraphobic avoidance)
- Interoceptive exposure
  - Targets “fear of fear” or somatic phobia (treatment for panic disorder)

Exposure

- An activity that provokes or triggers memories of the traumatic event:
  - Repeated or extended (prolonged) to objectively harmless but feared stimulus
  - For at least 20 minutes allows enough time to habituate and enough time to recoup with sufficient support
  - Also allows for the release of BE release
  - Start low—go slow

Exposure

Goal—for traumatic memories to lose their power

- a disparity between what a client is feeling (i.e. fear) and the objective reality that there is nothing to fear in the current environment
- Counterconditioning—the presence of positive phenomena that are antithetical to physical or psychological danger. "Cells that fire out of link lose their link." LTD

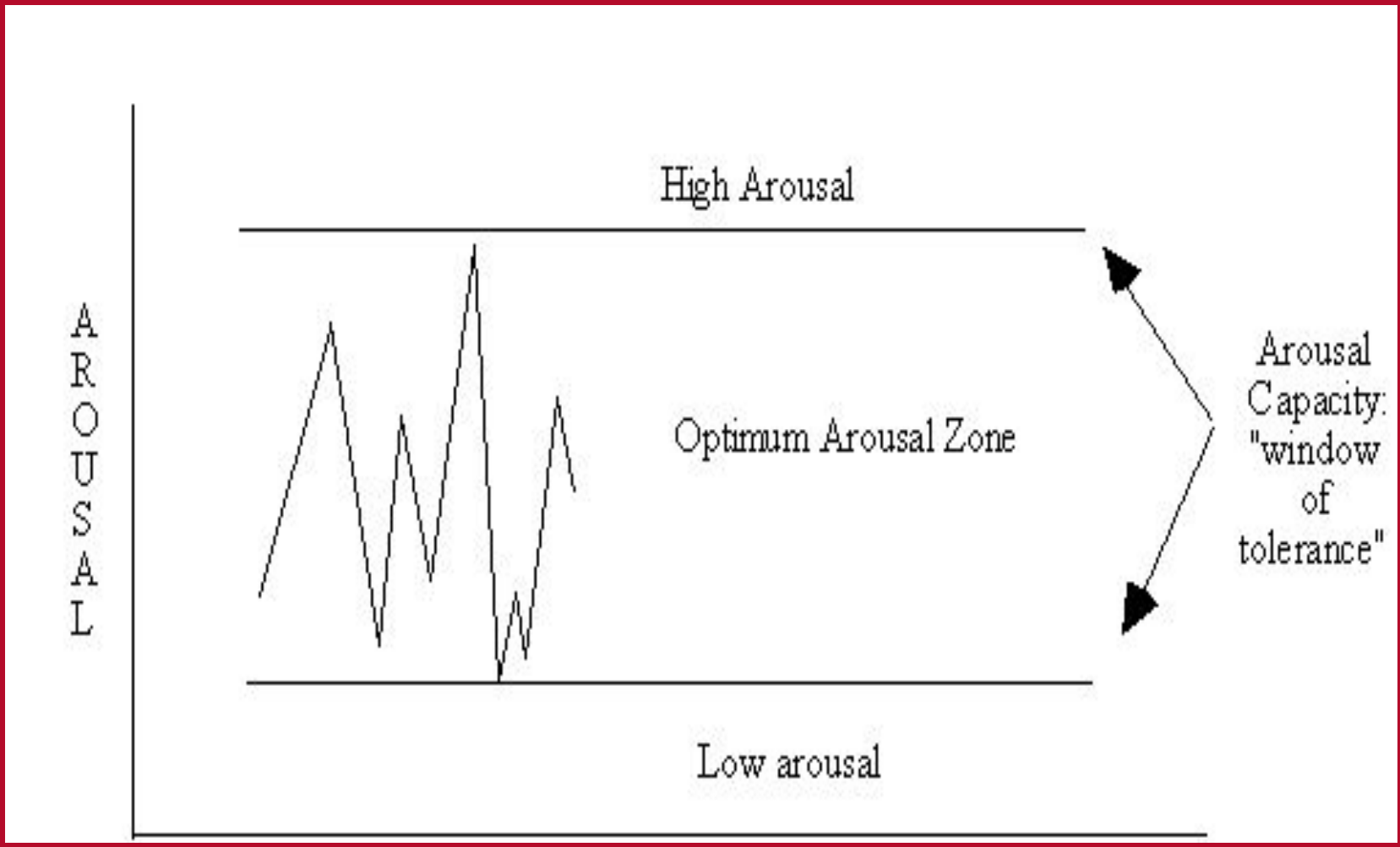
PTSD Treatment

- Increased size and activity of DLPFC
- Increased size and activity of the hippocampus
- Decreased activity of the amygdala
- SNS activity within the window of adaptive elevation
- Decreased PICs
- Recalibrated HPA

Activation

- Conditioned Emotional Responses (CERs e.g. fear, sadness, or horror)
- CERs are critical to trauma processing to extinguish emotional-cognitive associations to a given trauma memory must be:
  - Activated
  - Not reinforced
  - Counter-conditioned

Window of Tolerance



Affective Regulation of Condition Emotional Response (CERS)

- The skill of perceiving, labeling, and accepting emotion
- Identifying and modifying thoughts that exacerbate emotions
- Practical action—act in concert with values
- Insight into why/how the emotions are coming up
- Titrate the exposure within the window of Tolerance with the middle of the inverse "U"
  - Highest affect in the middle of the session then calm at the intensity curve at the end

Delaying tension reduction behaviors

- “Urge surfing”-ride it out, they are only temporary
- Hold off long enough to defuse the power
- The upsetting feeling will eventually become tolerable
- Don’t try to change the feeling but change your relationship to it.

Memory Reconsolidation

- Every time a memory is retrieved the underlying memory trace becomes once again fragile
- The memory trace goes through another period of consolidation
- Beta-adrenergic antagonists (i.e. propranolol) blocks reconsolidation of implicit fear-based memories by indirectly influencing protein synthesis in the amygdala (Debiec & LeDoux, 2004)

PTSD and Memory

- People with PTSD typically remember that the traumatic event occurred
- But describe blank periods, gaps, between vague details
- Recollection for details are often unclear, and disorganized (Harvey & Byant, 1999)

Dual Processing Theory

- Limitations of the "fear network" theory – doesn't account for implicit memory:
  - Verbally accessible memories (VAMs) on the conscious memory level. VAMs can be accessed in therapy through deliberate recall.
  - Situationally accessible memories (SAMs) non-conscious. SAMs are only accessible through exposure cues that activate the non-conscious network (Brewin, Dalgleish, and Joseph, 1996).

The Explicit system

- Verbally accessible memory (VAM) system—the narrative—autobiographic
  - Can be deliberately retrieved (Brewin, 2005)
  - Cortex and hippocampus
  - Past, present, and future
  - Available to verbally communicate
  - Restricted by attention and arousal
- Traumatized people use the VAM system to evaluate the trauma
  - They ask themselves “could it have been prevented?”
  - “What are the consequences….the meaning?”

The Explicit system

- VAM system memories are accompanied by “secondary emotions” (not experienced at the time of the trauma)
  - Directed at the past—i.e. regret or anger about the risks taken
  - Often involves guilt or shame over perceived failure or not preventing the event
  - Thoughts about the future—i.e. sadness at the loss of cherished plans or hopeless at the thought of not finding fulfillment

The Implicit System

- Lower level perceptual processing—too briefly apprehended to be bounded together in consciousness memory required for VAMs
  - Sights
  - Sounds
  - Physiological sensations including changes in heart rates, temp, or pain

The Implicit System

- Primary emotions—fear, horror, helplessness
- Accounts for flashbacks that can be triggered involuntary by cues related to the trauma (sight/sounds etc.)
- Not structured by verbally coded memories—therefore more extensive
- The more drawn out the trauma, the greater the tendency to experience a range of sensations and emotion
- Difficult to access in therapy

Client Education

- Though the flashbacks seem to "happen out of nowhere" they may be triggered by the same body sensations that you felt during or right after the trauma.
- Our work together will help you tolerate those sensations so that they don't trigger flashbacks.

Explicit and Implicit interactions

- SAM—implicit memory—amygdala related to the intensity of emotions
- VAM—explicit memory—hippocampus related to context and time
- SAM flashbacks occur via the fast track to the amygdala and override the VAM system
- ↑ cortisol and catecholamines impair the VAM system and kindle the SAM

Client Education

- Every time you go through this exposure exercise it will get easier.
- The higher parts of your brain, will rewire to put the brakes on the alarm button in the lower part of your brain.

Therapeutic Explicit and Implicit Integration

- Deliberately maintaining attention on the content of flashbacks w/o avoidance--SAM memories can be encoded in the VAM system.
- The timeless qualities of the SAM images and sensations get linked with spatial and temporal context—within the safety of the therapeutic relationship
- “I’m safe now—those things that that happened to me in the past”

Converting traumatic memories into meaning

- Traumatic memories are fragmented and disorganized into “hotspots” which can spur flashbacks
- Hotspots occur where there is maximal functioning separation between SAMs and VAMs (i.e. less integration) (Brewin, 2005)
- They need to be integrated and converted into a coherent and an organized form to reduce the risk intrusions into flashbacks (Ehlers & Clark, 2000; Conway & Playdell-Pearch, 2000)

Client Education

- Step-by-step. I am going to help you expose yourself to the cues that trigger the flashbacks so that you can bring them under control.

Explicit and Implicit Integration

- The process needs to be repeated for:
  - Neuroplasticity—the inverted “U”
  - To neutralize the traumatizing quality of the SAM system
  - So that VAMs can compete with SAMs and integrate them
    - The new VAM system puts the SAM system in perspective

Converting traumatic memories into narrative memories

- Raw sensory information needs to be interpreted and anchored with personal narrative organization and meaning.
- Reactivated through exposure and reconsolidated.
  - Not “correct” (i.e.. CBT) but a coherent and acceptable meaning (Constructivist)
- Newly constructed memories compete with original traumatic memory for attention

Client Education

- By getting your memory systems in sync, what had triggered flashbacks will fade away.
- Those flashbacks will lose their ever presence and be placed where they belong, in the past as you develop a meaningful future.

Orienting Response, REM, and Memory

- Somatic stimulation of the orienting response (i.e. via EMDR, EFT, acupressure etc.) involve:
  - *Shto takoe?* (Что такое? or *What is it?)*
  - Reorienting of attention -- triggered automatically when a sudden movement grabs attention or intentionally when you chose to look at an object
  - The reorienting of attention requires you to release your focus on one location so that it can shift to a new location
- The shift in attention involves:
  - The orienting response (Sokolov, 1990)
  - Induces REM like state
- Both facilitate cortical integration of memories (Stickgold, 2002)

Neurotransmitters and sleep

- REM--↑ acetylcholine and ↓ NE and 5-HT (Kametani & Kwamura, 1990)
- Non-REM—5-HT (Portas, et. al., 1998)
- With PTSD failure to shut down NE results in:
  - Fragmented sleep (Mellman, et. al., 1997)
  - ↓ REM (Glaubaum, 1990)
  - Replay of traumatic and self-perpetuating trauma related memories (Stickgold, 2002)
  - Nightmares

Re-orienting Response Therapies

- Somatic therapies activate re-orienting response:
  - ↑ ACC and L-PFC (Levin, et. al., 1999)
  - ↓ galvanic skin response—correlated with ↓ adrenergic drive
- Re-orienting therapies facilitate REM-like memory processing but with FL input (unlike REM)
  - By holding traumatic image in mind with shifts attention to somatic-based stimuli

Re-orienting Response Therapies

Moderating NE though the therapeutic “safe emergency” maximize neuroplasticity.

- REM-like state facilitates integration of traumatic memories into associative cortical networks
- The integrated corticohippocampal circuts induce a weakening of the traumatic episodic memory with its associated affect
- Allows pt to see the significance and meaning of the traumatic event from an new life perspective and lessen the emotionally charged impairment that the trauma caused

Shifts in attention and asymmetry

- **Why activate the RH when it is already overactive? How about tapping the right hand and/or foot?**
- **The right limb tapping method still includes:**
  - **reorientation response**
  - **attentional shift**
  - **grounding**
- **This method is portable—the client can practice on his own (neuroplasticity)**

Client Education

- I’m going to ask you to direct your attention to the specific movement while at the same time you describe the traumatic event.
- This will help you reset your brain so that it will no longer be stuck in the past and you can move ahead to a positive future.

Growth After Trauma

- Some assumptions buffer us from initial distress of the trauma but reduce the possibilities for schema change and growth.
- Yet, growth occurs when schemas are changed by traumatic events. Old schemas are destroyed and replaced by new schemas with questions: "I almost died! Why?"

Client Education

- Though there is no turning back to before the trauma and the old you, the new you can be a more caring person with a positive future.

Principles of Growth After Trauma

- Certain personality characteristics are related to the possibility for growth.
  - hardiness, optimism, and self-efficacy allow one to see growth within those perspectives.
- Growth occurs when the trauma serves as a central pivotal change in one's life. It allows one to shift perspective to a new era.
  - *Wisdom results from growth. One sees what is possible and what is not. Like the Serenity prayer* (Tedeschi and Calhoun, 1995)

Client Education

- Many people who have been horribly traumatized have gone ahead to gain a deep sense of meaning, and wisdom.

BBT and PTSD

- Phase 1: Psychological first aid—stabilizing ASD and preventing PTSD
- Phase 2: Integration of implicit and explicit memory systems:
  - Explicit memories (VAMs) –The conscious memory level, which can be accessed in therapy through deliberate recall.
  - Implicit memories (SAMs) –The nonconscious, which are only accessible through cues that activate the network.
  - Aided by somatic reorienting method
- Phase 3: Posttraumatic growth—developing meaning and direction (Constructivism)

SAFE from PTSD

"S" is for stabilizing. To establish a healthy foundation for recovery.

"A" is for acceptance of what happened. No victimization on one extreme or on the other of event(s) that occurred in the past.

"F" is for future. To visualize a hopeful posttraumatic growth.

"E" is for exposure. To confront the feelings and sensations that trigger flashbacks.

Bret's BASE

B--Increased amygdala and dampened hippocampus—Substance abuse

A--Buddy connection

S--Numbing, re-experiencing (barbecue) and avoidance

E--New Narratives—Exposure at McJack Jr's—Posttraumatic Growth

The Five Risiliency Factors

- Social
- Exercise
- Education
- Diet
- Sleep

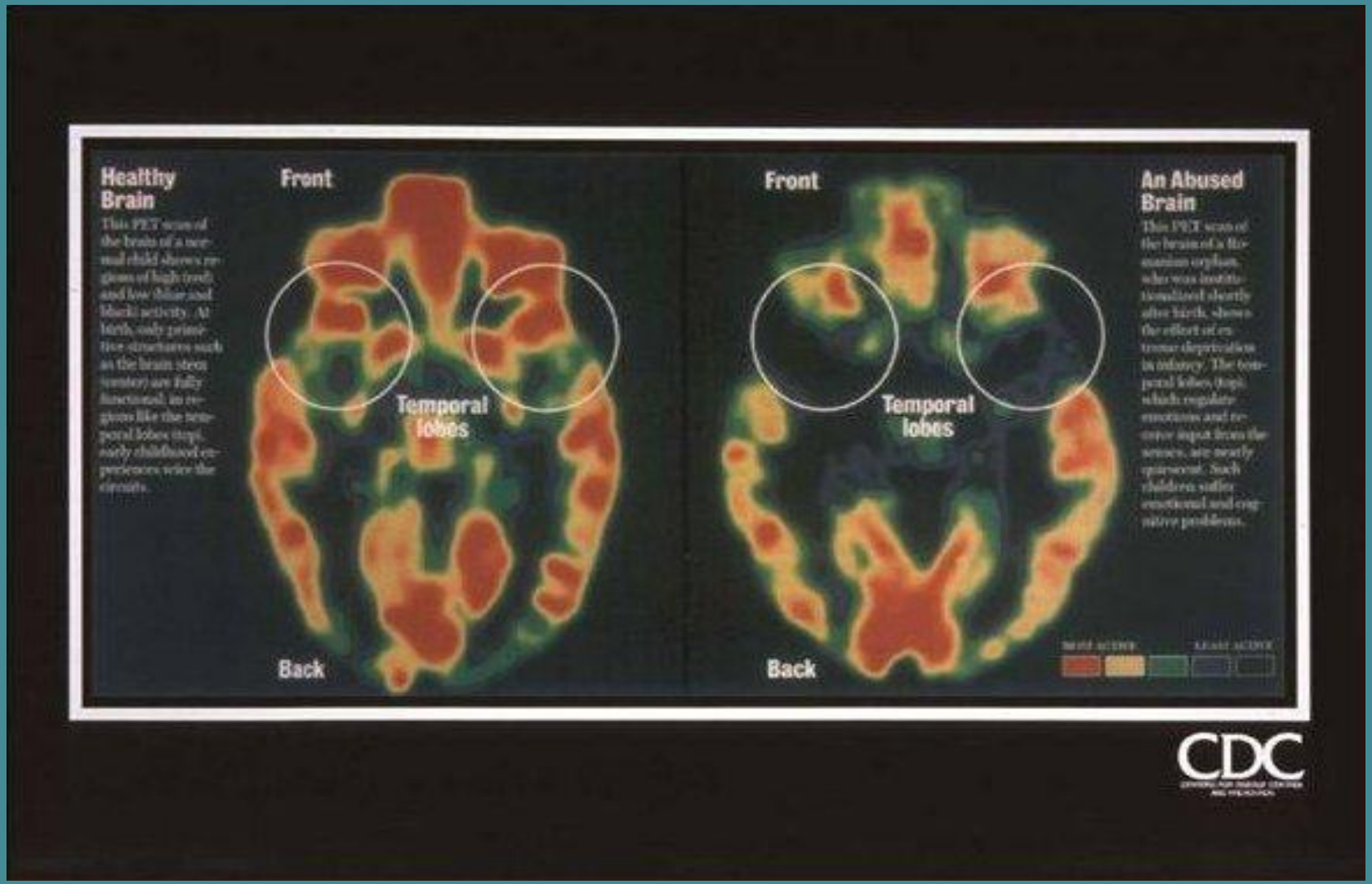
The Effects of Social Medicine

- ↓ Cardiovascular reactivity (Lepore, et al, 1993)
- ↓ Blood pressure (Spitzer, et al, 1992)
- ↓ Cortisol levels (Kiecolt-Glaser, et al, 1984)
- ↓ Serum cholesterol (Thomes, et al, 1985)
- ↓ Vulnerability to catching a cold (Cohen, et al, 2003)
- Depression (Russell & Cutrona, 1991)
- ↓ Anxiety (Cohen, 2004)
- ↓ Natural killer cells (Kiecolt-Glaser, et al, 1984)
- ↑ Slows cognitive decline (Bassuk, et al 1999)
- Improves sleep (Cohen, 2004)

Client Education

- It's common to feel like being alone after a traumatic event. But, isolating now will make you worse and feel even more alone.
- Parts of your brain activate when you are with people which helps you buffer anxiety and lift depression.

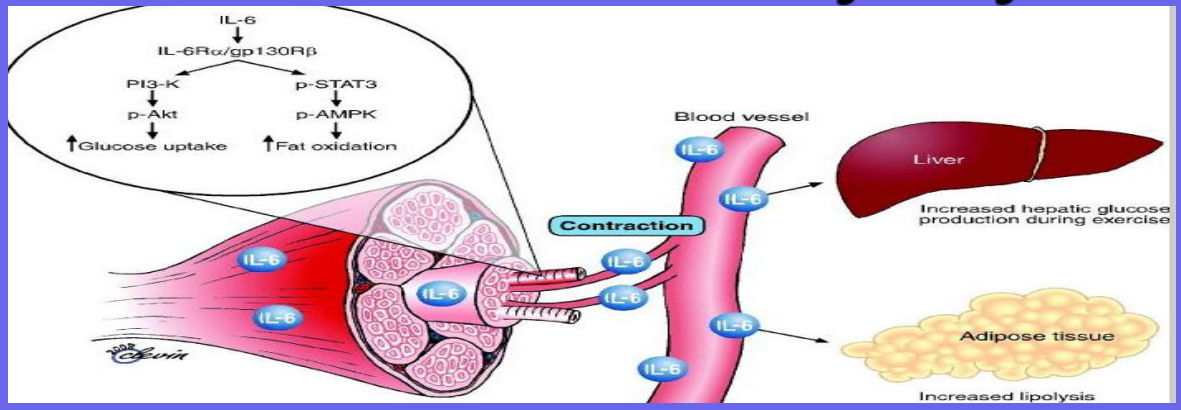
“Normal” vs Abused Brains



Movement is an Evolutionary Imperative

- 5 million years as Hunter-gathers
  - Activity level
- Walking 10 miles a day

Myokines:
Anti-inflammatory Cytokines



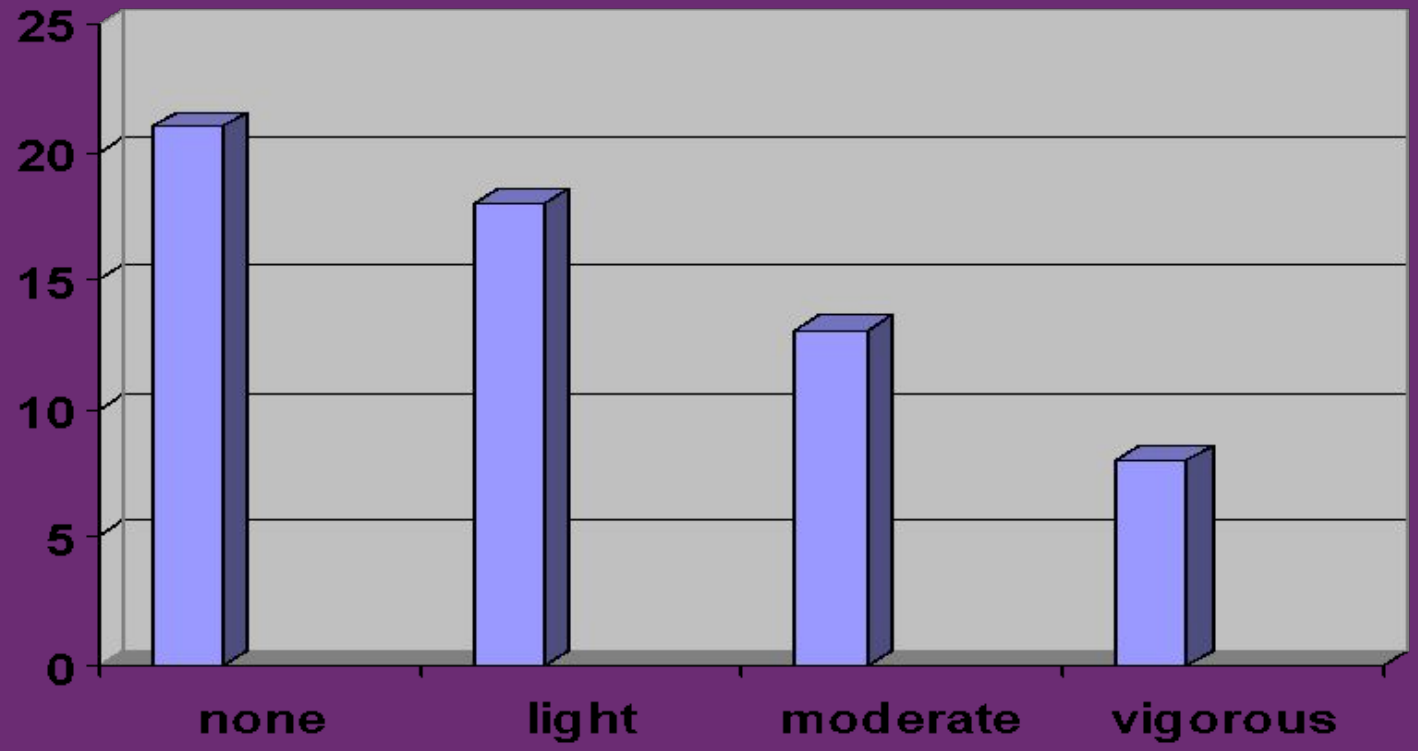
While inactive muscle could contribute to pathologies, myokines are candidates for treating metabolic diseases

Exercise-induced myokines are involved in mediating anti-inflammatory effects

Pedersen BK. The disease of physical inactivity - and the role of myokines in muscle-fat cross talk. The *Journal of Physiology*. 2009;587(23):5559–5568. doi:10.1113/jphysiol.2009.179515.

Effect on C-Reactive Protein

- The effect of exercise on C-Reactive Protein (inflammation chemical). Degree of physical activity by level of C-Reactive Protein Based on study of 13,748 people (Ford, 2002)

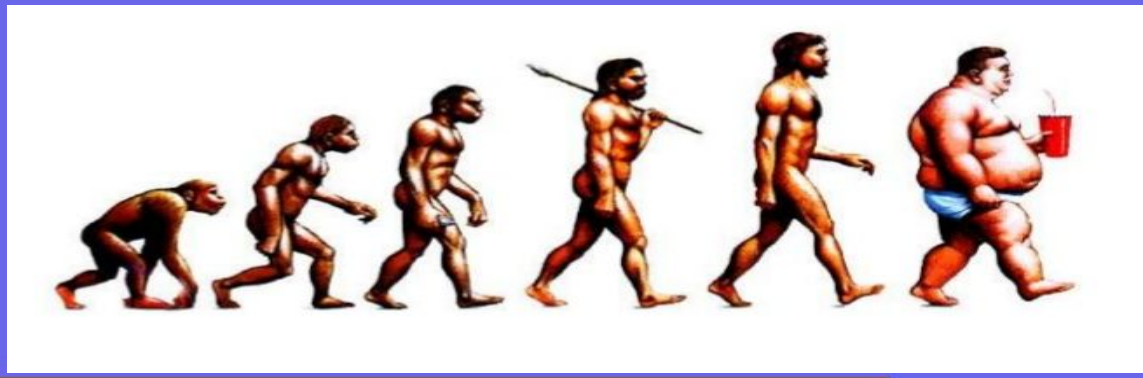


Exercise and the Brain

Mechanism	Impact
Gene Expression	Neuroplasticity (Cottman & Blanchard, 2002)
Brain Derived Neurotrophic Factor (BDNF)	Neuroplasticity (Adlard, et al, 2005)
Insulin-like Growth Factor (IGF-1)	Enhanced Neural (Carro. et al 200)
Nerve Growth Factor	Enhanced Neuroplasticity (Neeper, et al, 1996)
Vascular Endothelial Growth factor (VEGF)	Enhanced Neurogenesis (Fabel, et al, 2003)

Perils of the Western Diet

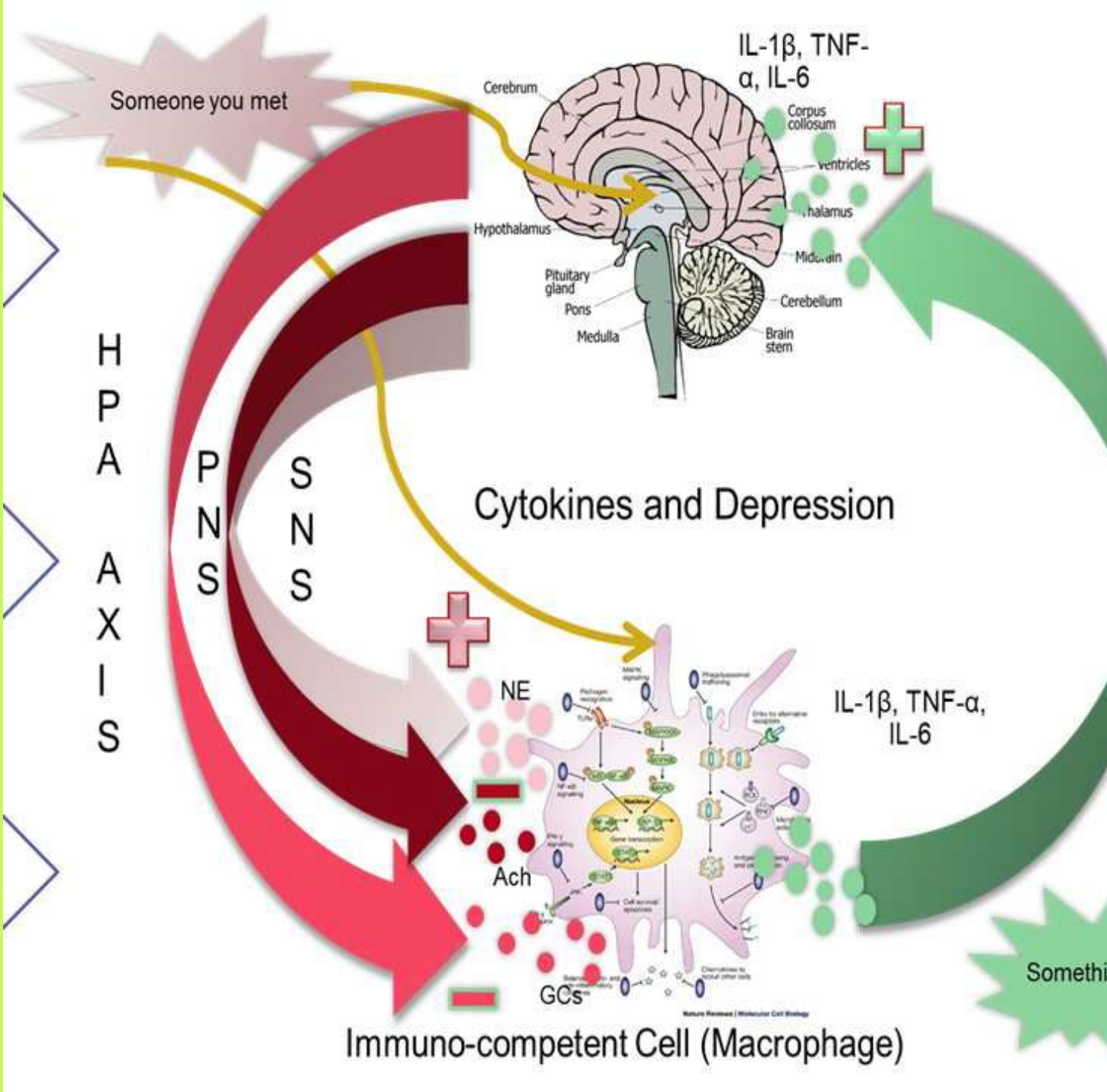
- Fructose blunts the effects of leptin which normally tells
  - Fructose produces uric acid
- Increased cardiovascular disease
- Increasing risk of metabolic syndrome
- **Shrinks the left hippocampus**
- Increased blood pressure
- LDL cholesterol
- Increased stroke
- Diabetes



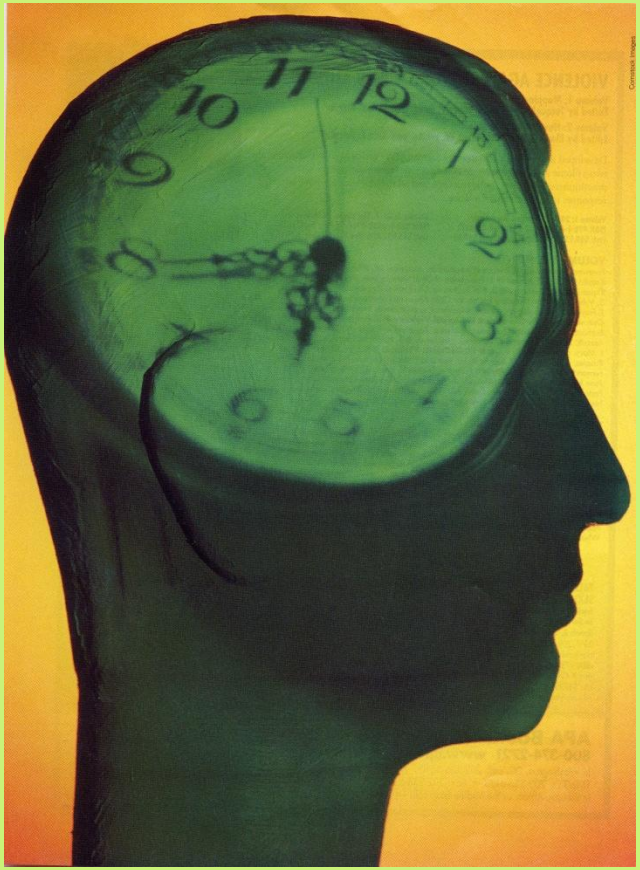
Gut Bacteria

- 90% of bacteria in the colon F/B ratio:
- Firmicutes
  - Fat loving—increases fat absorption
  - Efficient at extracting calories from carbs
  - Turns on genes that increase the risk for obesity, diabetes, and CVD
- Bacteroidetes
  - More dominant in lean people

- Bad Diet
  - Simple carbs
  - Transfatty acids
  - Saturated fats
  - Food allergies
  - Bad oils
  - High dairy
  - High gluten
- No exercise
- Chronic illnesses
- Autoimmune disorders
- Chronic pain
- Chronic stress
- Being overweight
  - Apple shape
- Leaky gut

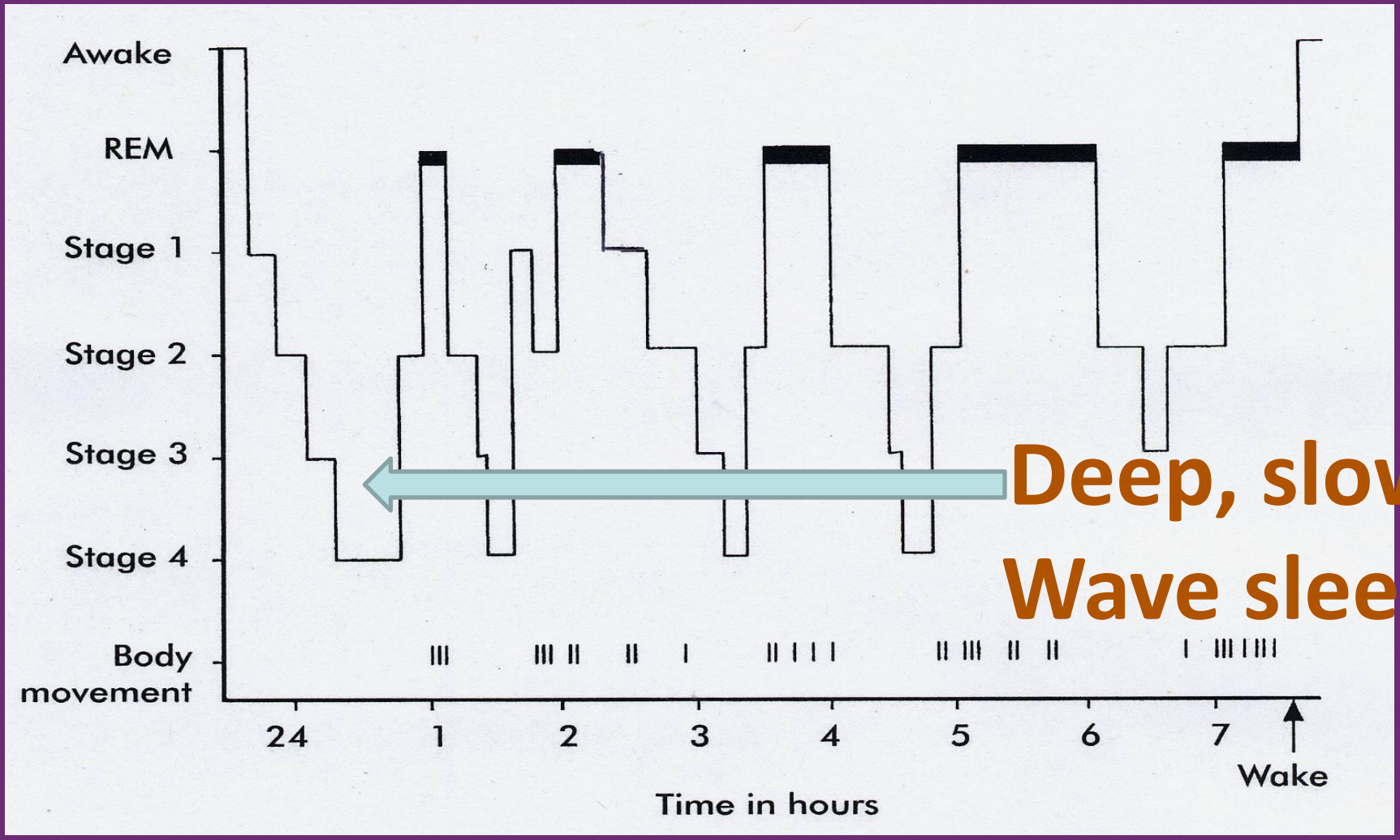


Circadian Rhythm



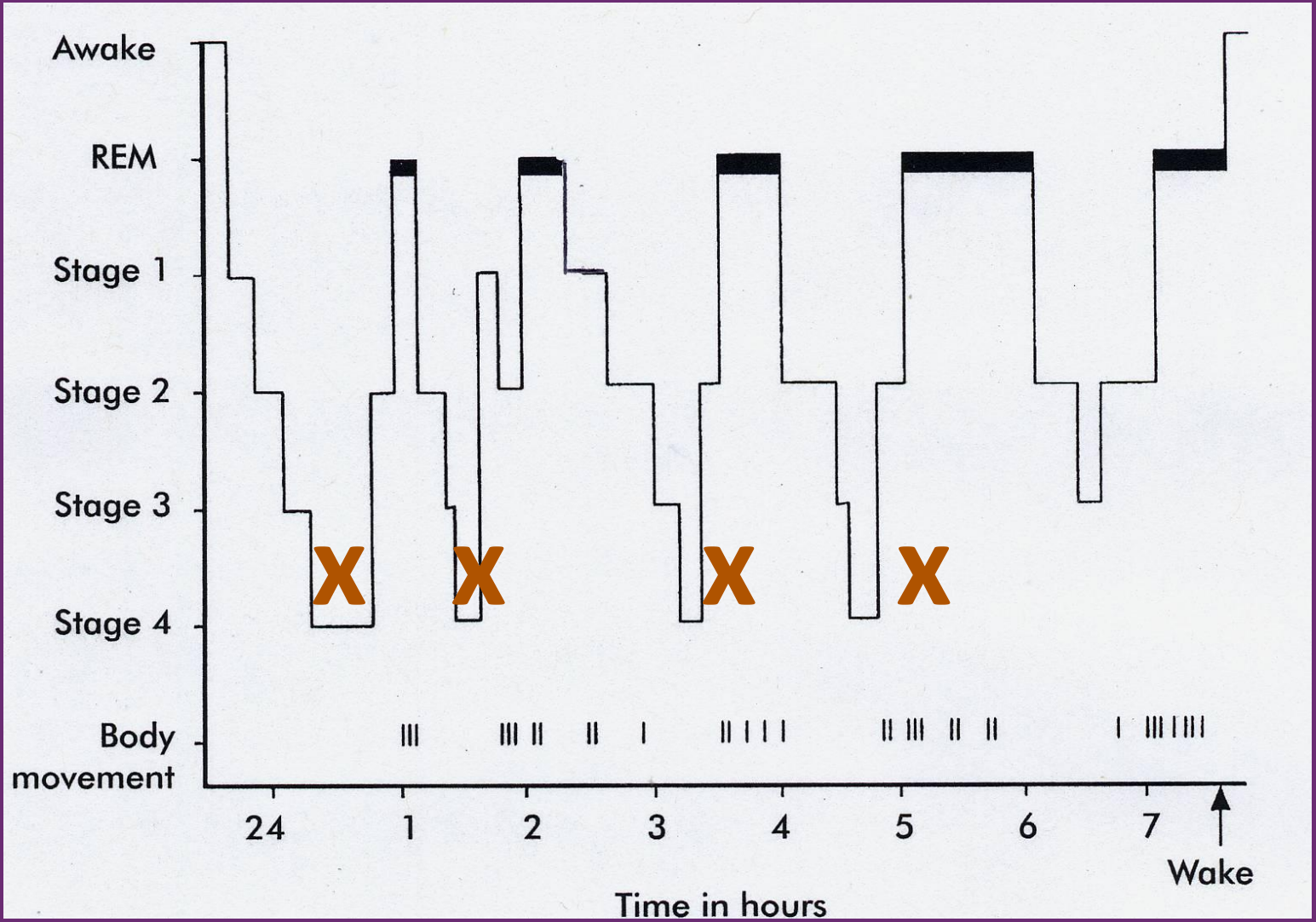
- **Wake and asleep times**
- **Body temperature**
- **Release of specific hormones**
- **Regulation of the immune system**
- **Recalibrating the brain**

Normal Sleep Architecture



Pathologic Changes in Slow wave sleep

dep, anx, pain, apne, substance abuse



Slow wave (deep) sleep

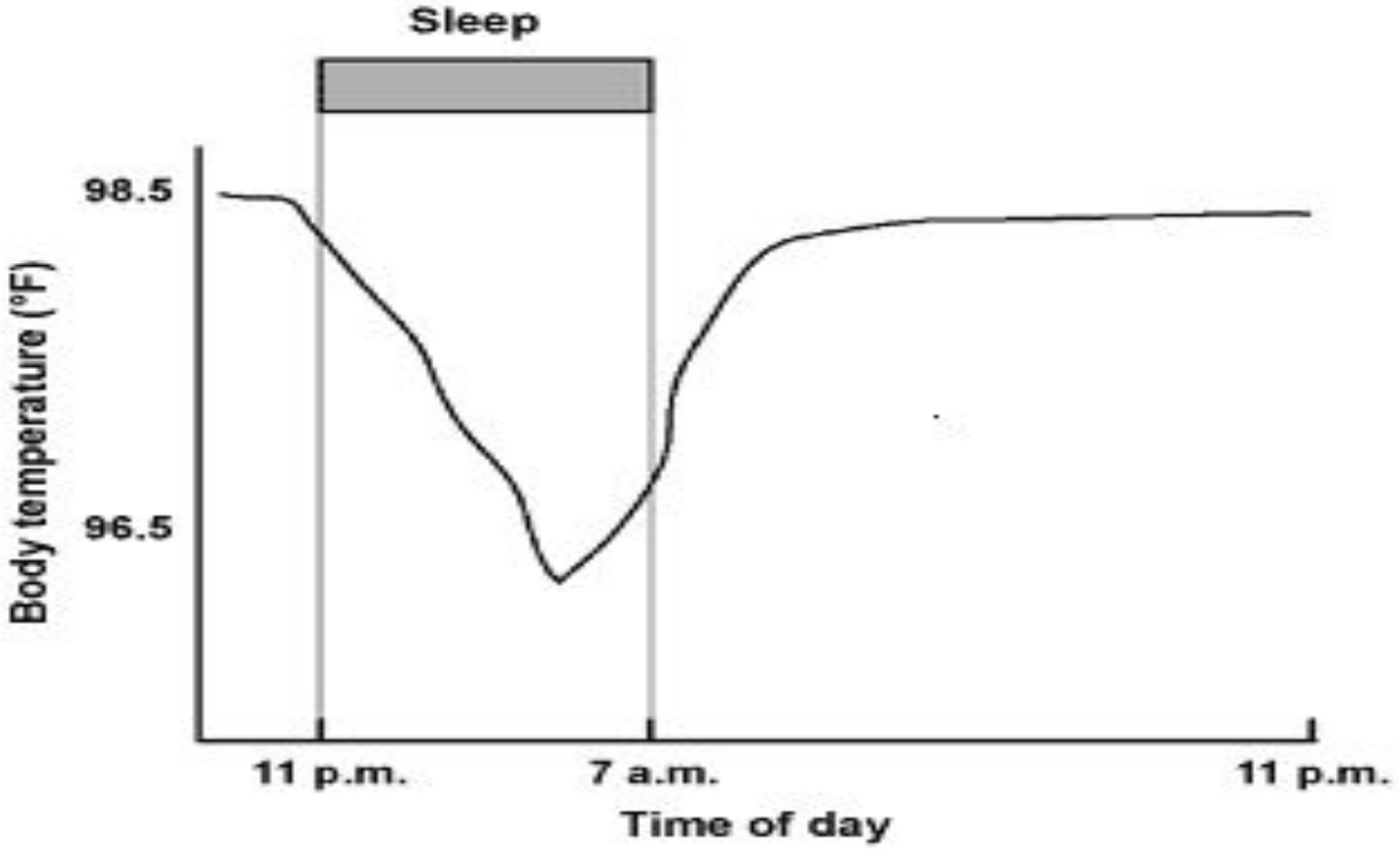
- Restorative (deep) sleep
- Deprivation:
  - > Fatigue
  - > Troubles concentrating
  - > Impaired emotion regulation
  - •Depression

Brain Clearing

- “Glymphatic" system, a nod to both glial cells and its functional similarity to the lymphatic system
  - –Sleep as a dishwasher for your brain
- Sleep clears B-amyloid in the brain via increased CSF flow in interstitial space

Brain Washing and Deep Sleep

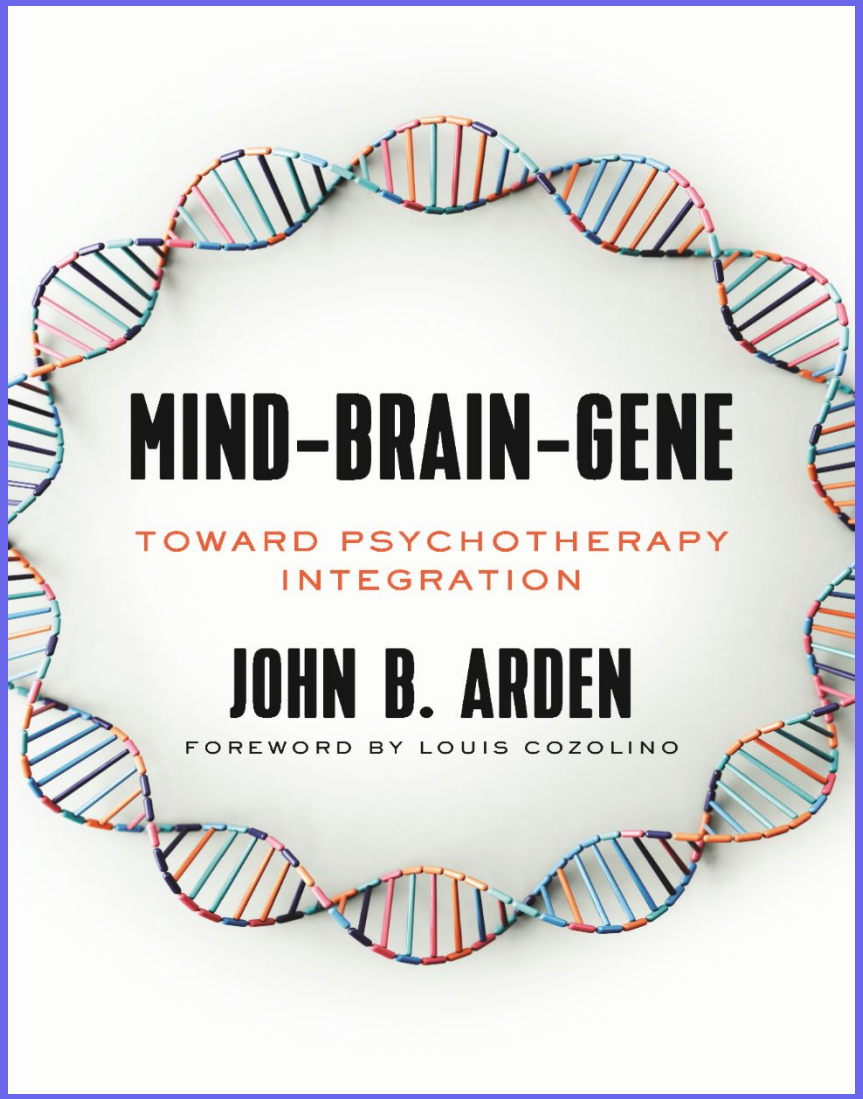
Body Temp and Sleep

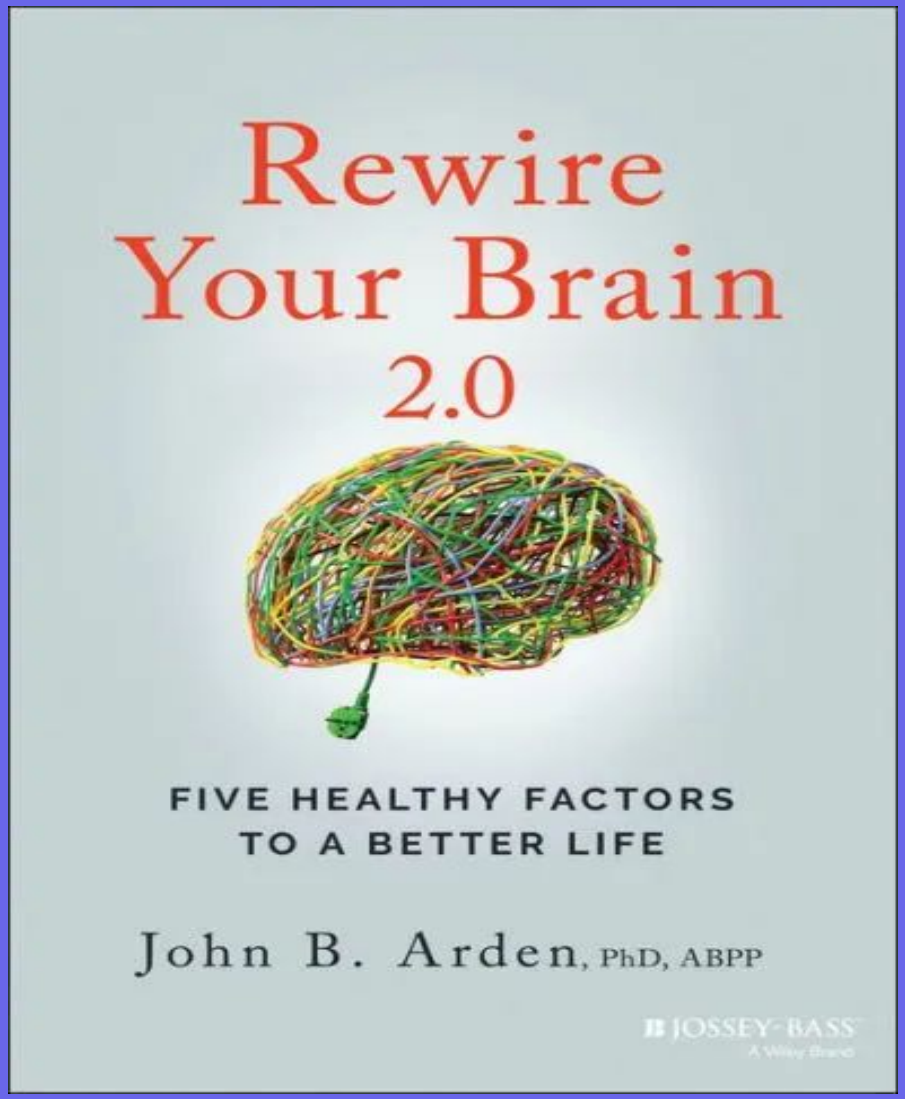


Sleep Summary

- Under 6 hours impairment
- Avoiding sleep depressors
- Negative sleep thoughts
- Body temperature
- Diet
- Exercise

References


MIND-BRAIN-GENE
TOWARD PSYCHOTHERAPY INTEGRATION
JOHN B. ARDEN
FOREWORD BY LOUIS COZOLINO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