5 Boroughs Partnership NHS
NHS Foundation Trust

BART Psychotherapy

Trauma psychotherapy: Bilateral Affective Reprocessing Trauma (BART): a dynamic new model:- {hearts, guts & minds} Information for clinicians

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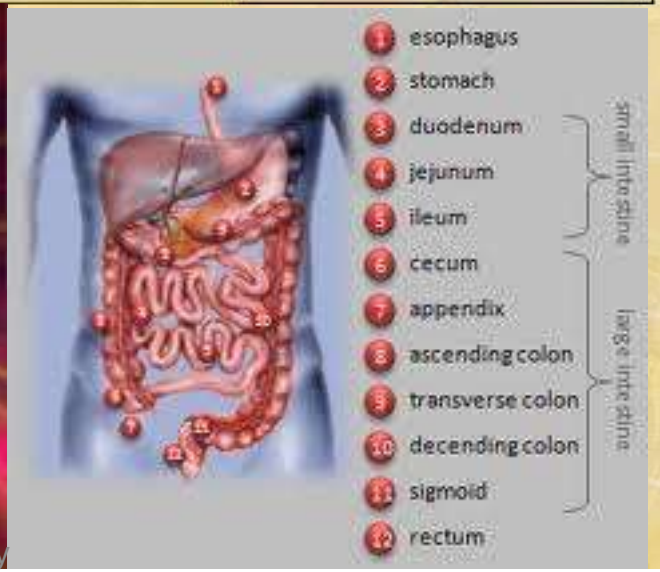
5 Boroughs Partnership NHS Foundation Trust
4th EMDR study day 5 Oct 2012

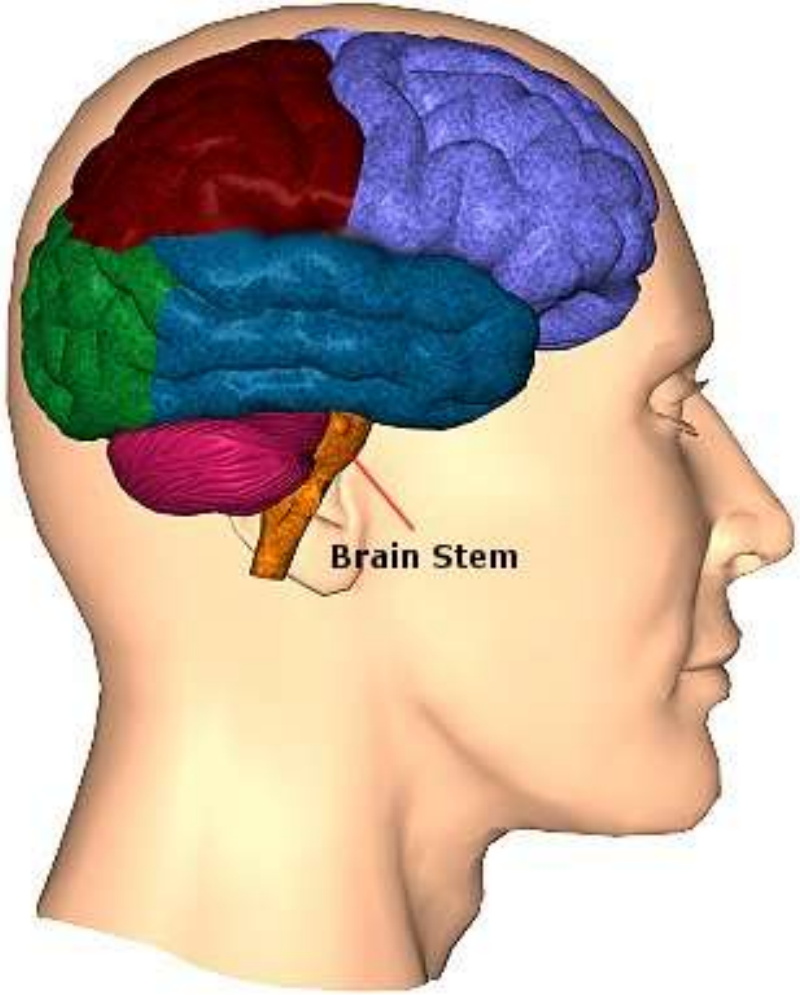
…1…2…3…4…5…

A Better View

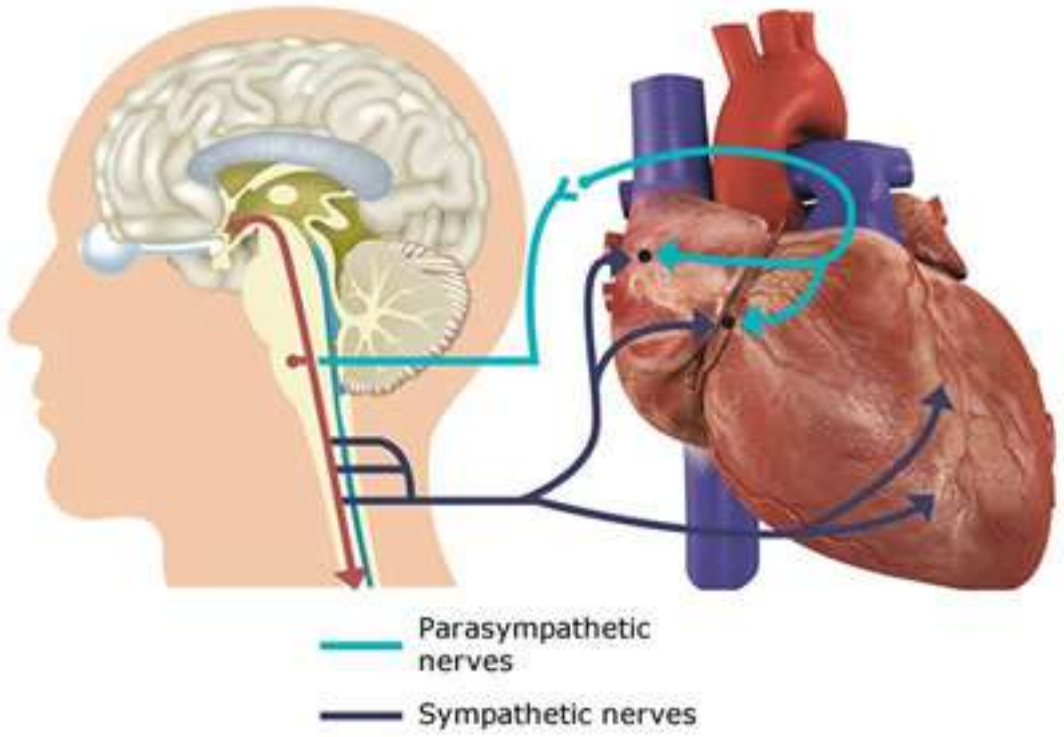
Physical Brain	Heart Brain	Gut Brain
Analytical	Emotional	Reactive (Reflective)
Logical (Objective)	Subjective	Turbulent



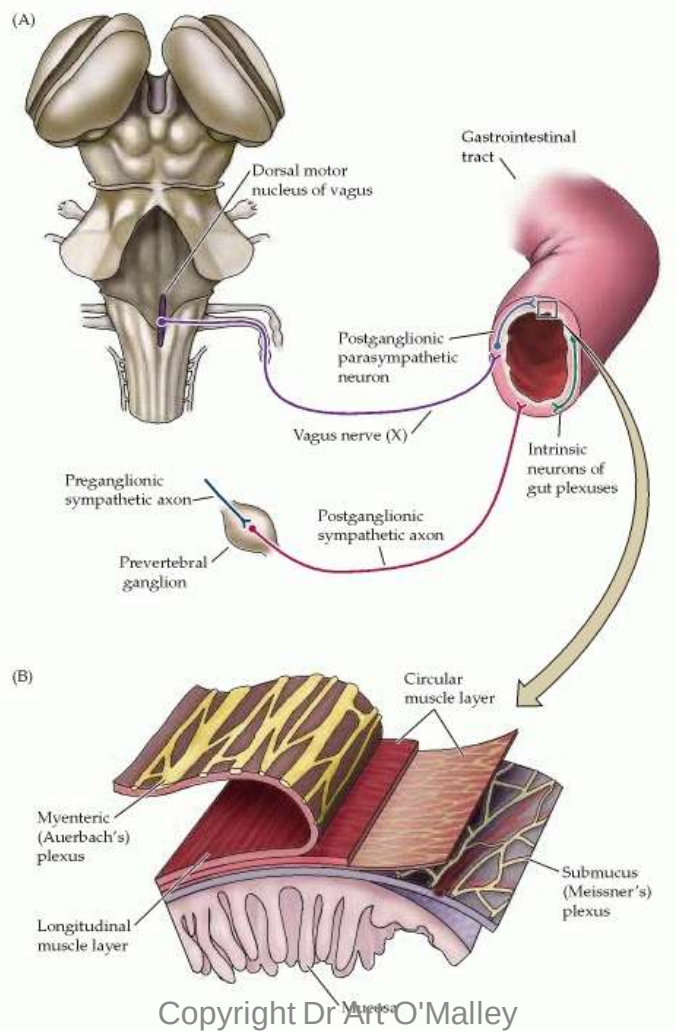
Brain Overview



Heart- Brain Connection

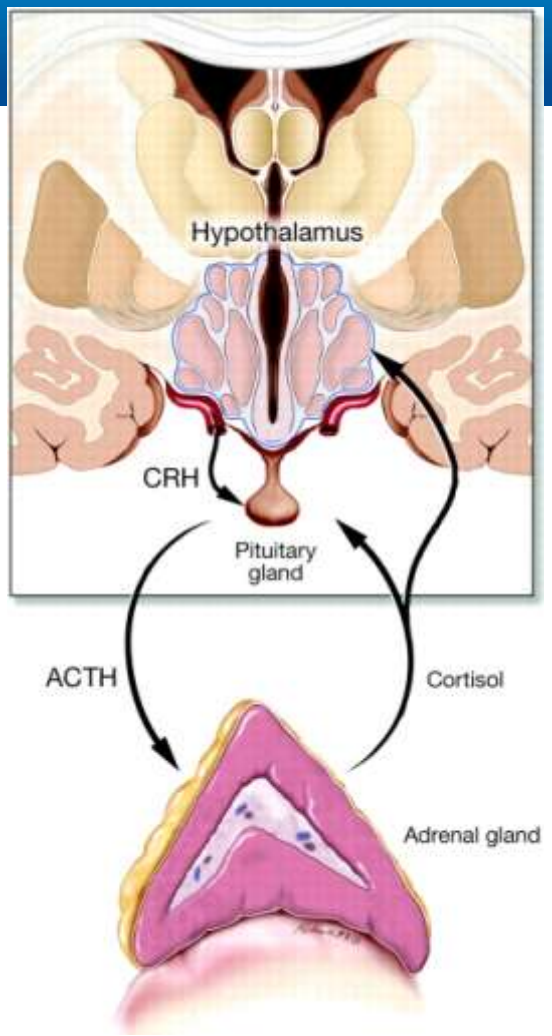


Gut – Brain Connection



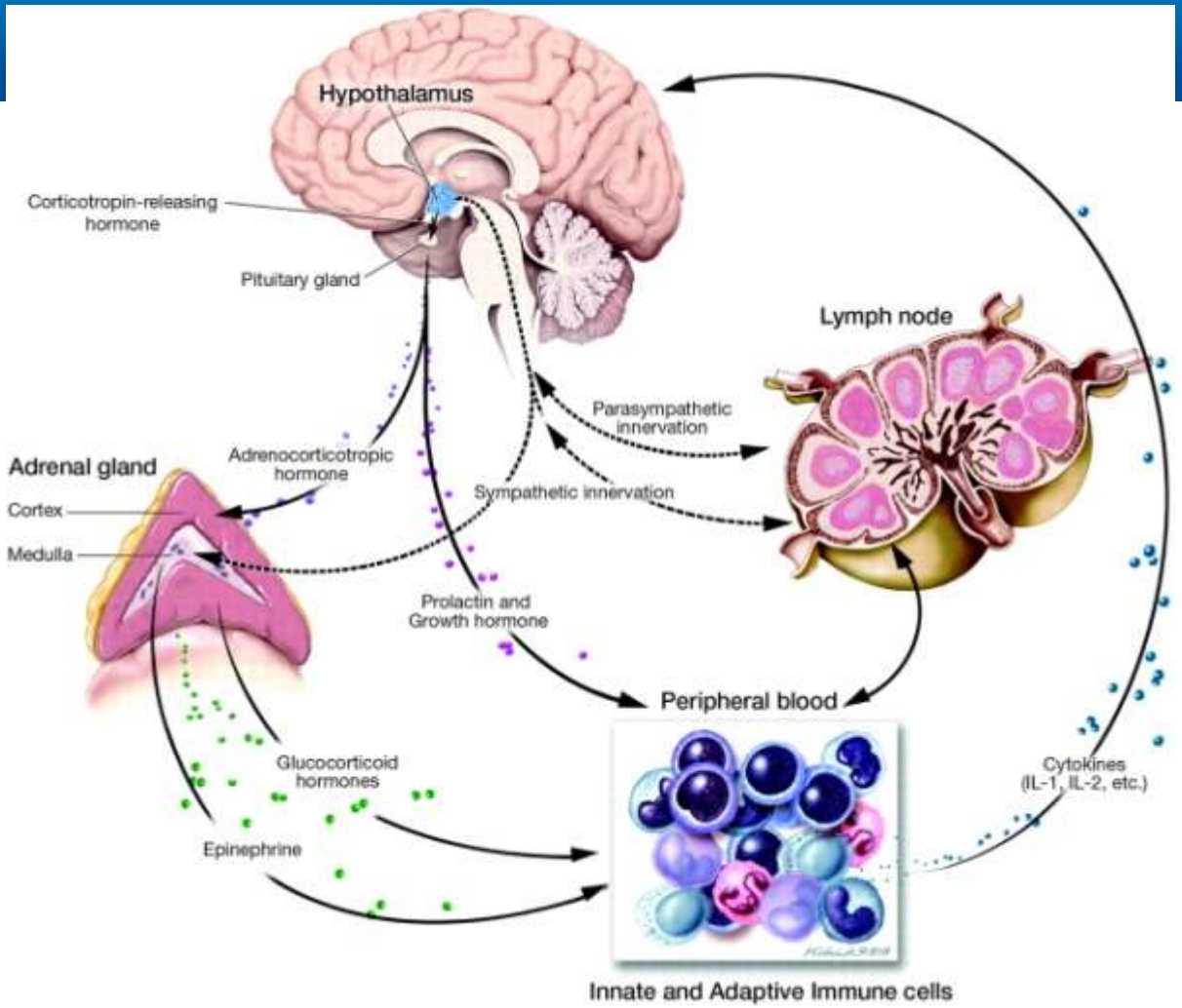
Head-Heart-Gut Brain Connection

Figure 4. Hypothalamic-pituitary-adrenocortical axis.

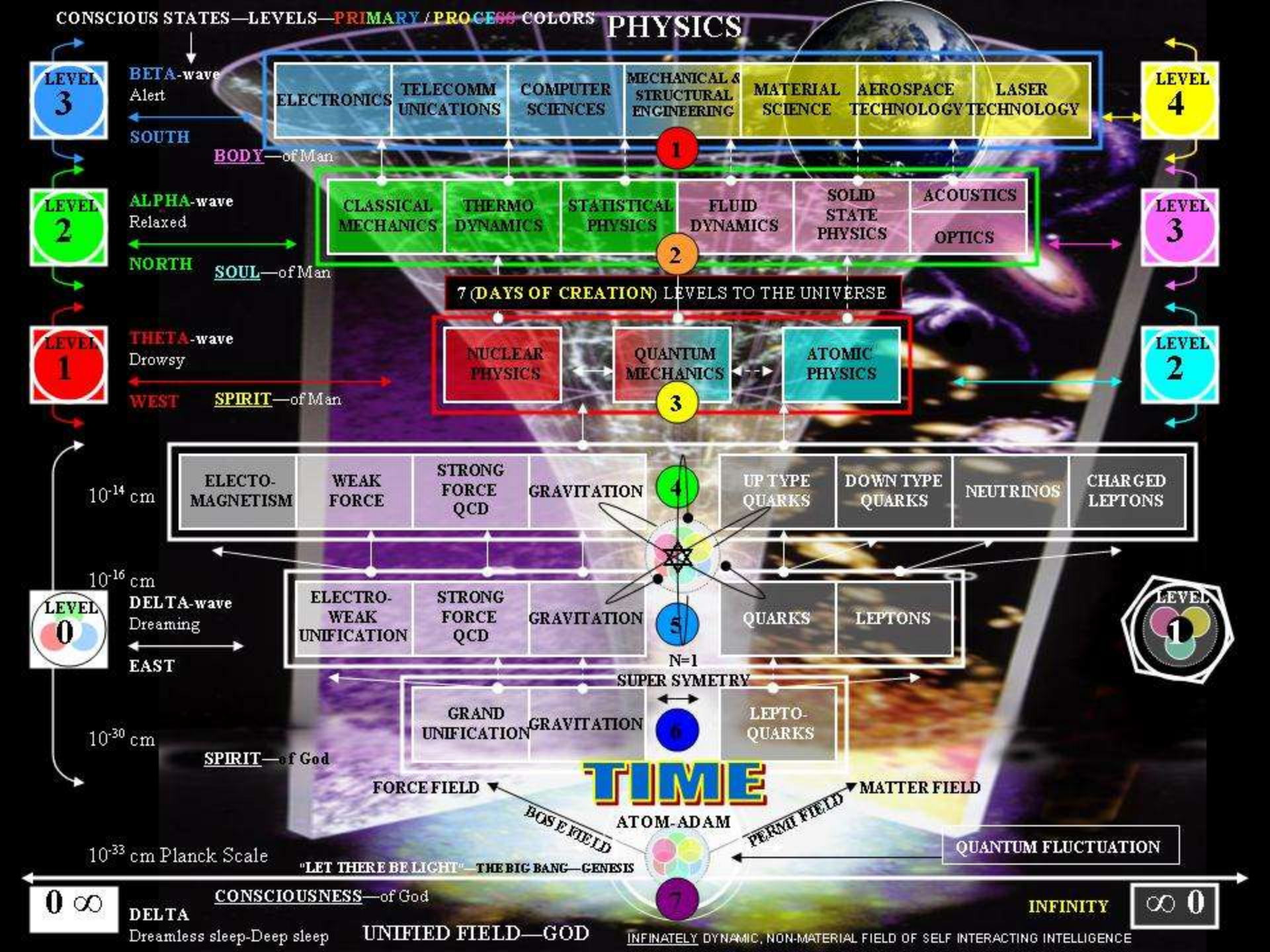


Lane R D et al. Psychosom Med 2009;71:117-134

Figure 5. Brain-immune system interactions.



Lane R D et al. Psychosom Med 2009;71:117-134


CONSCIOUS STATES—LEVELS—PRIMARY / PROCESS COLORS
PHYSICS
LEVEL 3
BETA-wave
Alert
SOUTH
BODY—of Man
ELECTRONICS
TELECOMM UNICATIONS
COMPUTER SCIENCES
MECHANICAL & STRUCTURAL ENGINEERING
MATERIAL SCIENCE
AEROSPACE TECHNOLOGY
LASER TECHNOLOGY
LEVEL 4
1
LEVEL 2
ALPHA-wave
Relaxed
NORTH
SOUL—of Man
CLASSICAL MECHANICS
THERMO DYNAMICS
STATISTICAL PHYSICS
FLUID DYNAMICS
SOLID STATE PHYSICS
ACOUSTICS
OPTICS
LEVEL 3
2
7 (DAYS OF CREATION) LEVELS TO THE UNIVERSE
LEVEL 1
THETA-wave
Drowsy
WEST
SPIRIT—of Man
NUCLEAR PHYSICS
QUANTUM MECHANICS
ATOMIC PHYSICS
LEVEL 2
3
10^{-14} cm
ELECTO-MAGNETISM
WEAK FORCE
STRONG FORCE QCD
GRAVITATION
4
UP TYPE QUARKS
DOWN TYPE QUARKS
NEUTRINOS
CHARGED LEPTONS
10^{-16} cm
DELTA-wave
Dreaming
EAST
LEVEL 0
ELECTRO-WEAK UNIFICATION
STRONG FORCE QCD
GRAVITATION
5
QUARKS
LEPTONS
LEVEL 1
N=1
SUPER SYMETRY
10^{-30} cm
SPIRIT—of God
GRAND UNIFICATION
GRAVITATION
6
LEPTO-QUARKS
TIME
FORCE FIELD
MATTER FIELD
BOSE FIELD
FERMI FIELD
ATOM-ADAM
10^{-33} cm Planck Scale
QUANTUM FLUCTUATION
"LET THERE BE LIGHT"—THE BIG BANG—GENESIS
7
0 ∞
CONSCIOUSNESS—of God
DELTA
Dreamless sleep-Deep sleep
UNIFIED FIELD—GOD
INFINITY
∞ 0
INFINATELY DYNAMIC, NON-MATERIAL FIELD OF SELF INTERACTING INTELLIGENCE

Manual Objectives

- Understanding of different types of traumatic stress
- Focus on children and adolescents but equally applicable to adults
- Update on neurobiology and research
- Development of my treatment model which has evolved over 12 years of treating patients with complex trauma

Manual Summary

- Disorders of extreme or ‘toxic’ stress
- Risk factors and outcomes
- Triggers & Aetiology
- In utero influences
- Neurobiology (handy take home model)
- Stress hormones & Limbic System
- Stages of Bilateral Affective Reprocessing Thought (BART stages 1-5)

Controversial aspects

- Nature of dissociation
- Visual model of autonomic nervous system
- Bilateral affective reprocessing therapy evidence
- As an integration of head, heart and gut brain reprocessing
- Quintessential model of the brain and neurobiological rationale (2008-2011)

Extreme stress in children

- ‘over the years our bodies become walking autobiographies, telling all those around us friend and foe alike of the minor and major stresses of our lives’
- In other words our bodies keep score in our constant battle to process traumatic (wounding) events

Reaction to trauma

- Most children have a normal reaction that resolves over time.
- A minority become overwhelmed
- Hyper reactive due to chronic stress
- Go on to develop PTSD or
- Developmental trauma disorder

Trauma in childhood

- Immune and neurological problems:
- Asthma
- Allergies
- ADHD
- Headaches
- GIT problems
- Girls CFS, fibromyalgia, IBS, Pelvic pain
- Dysmenorrheal symptoms

PTSD associated with

- Depression
- Anxiety
- Substance misuse
- Eating disorders
- OCD
- Dissociative disorders &
- Borderline Personality Disorder

Children in foster care

- Rates of PTSD vary from 12 -40%! *(Kolko et al Child maltreatment 2010)*

In the general population:

- The rate for female adolescents twice that for males (*Stam 2007 neuroscience and biobehavioural reviews)*

Following sexual abuse

- 50% met criteria for PTSD (Barlow 2002)
- 30% of rape victims
- 60% of sexual assault victims in war experience PTSD
- Worldwide massive ongoing tsunami of cases of PTSD

Risk Factors

- Trauma type
- Exposure to violence esp. domestic
- Gender
- Age
- Socioeconomic status
- Developmental level
- Past psychiatric history
- Support and acute reaction to trauma

What improves outcome?

- Child's perception of family support crucial in moderating the disorder
- Once established by 1 month persist unless targeted effective trauma focused therapy is received.
- Trauma focused therapy necessary to improve psychological well being and establish resilience leading to recovery

Symptoms

- First month after trauma termed acute stress disorder or ASD >50% go onto develop PTSD
- Late onset PTSD is the norm:
  - Sensitization
  - Cumulative effect of exposure
  - Fear conditioning
  - Kindling

Children

- Regression (thumb sucking bedwetting
- Mute or immature speech)
- Nightmares (Sheer terror monsters)
- Sleep disturbances
- Reenactment through trauma play
- Hyperaroused startle response
- Irritable angry detached
- Memory clouded impaired concentration

Adolescents

- Sense of foreshortened future
- Forecast future in negative terms
- Regression :
  - High risk behaviour
  - Suicidality
  - Substance misuse
  - Non suicidal self injury
  - Depressive withdrawal

Anticipatory Stress Response

- Feeling based on emotions:
  - Fear
  - Distress
  - Anger
  - Rage
  - Humiliation
  - Shame
  - Despair
  - Panic

Disgust

Anger

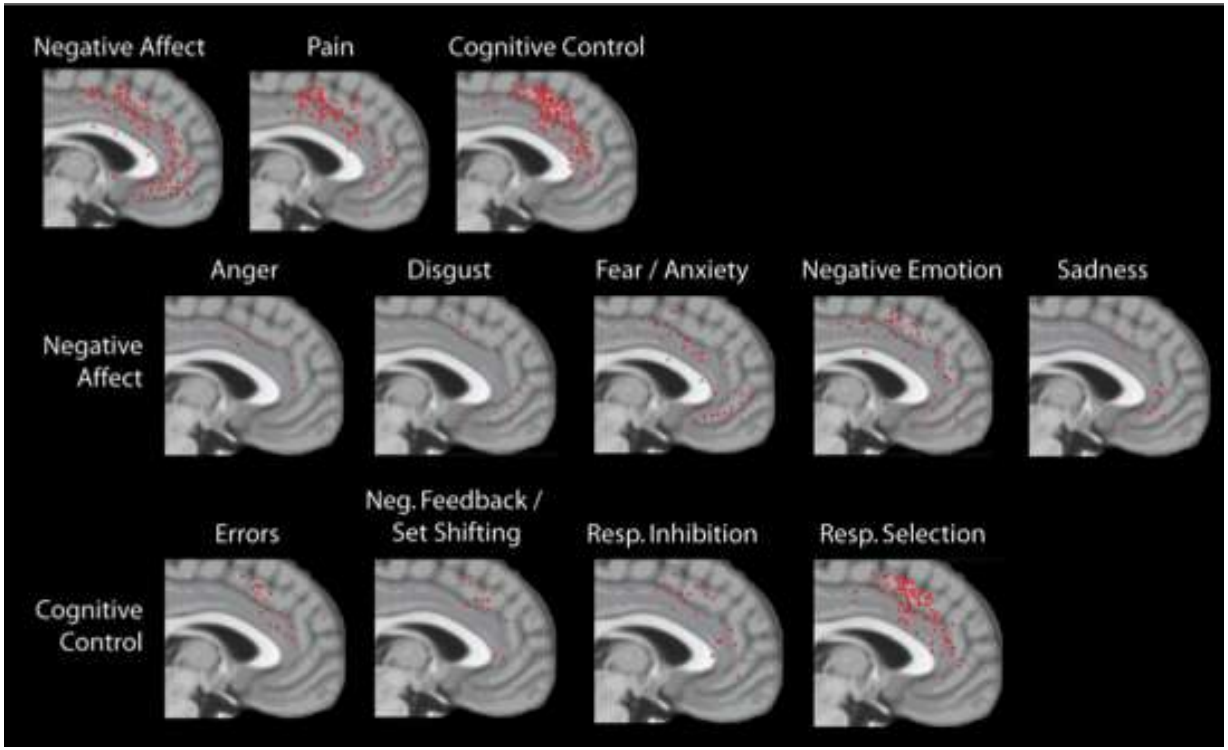
Sadness

Happiness

Fear

Surprise

fMRI of Affect & Cognition



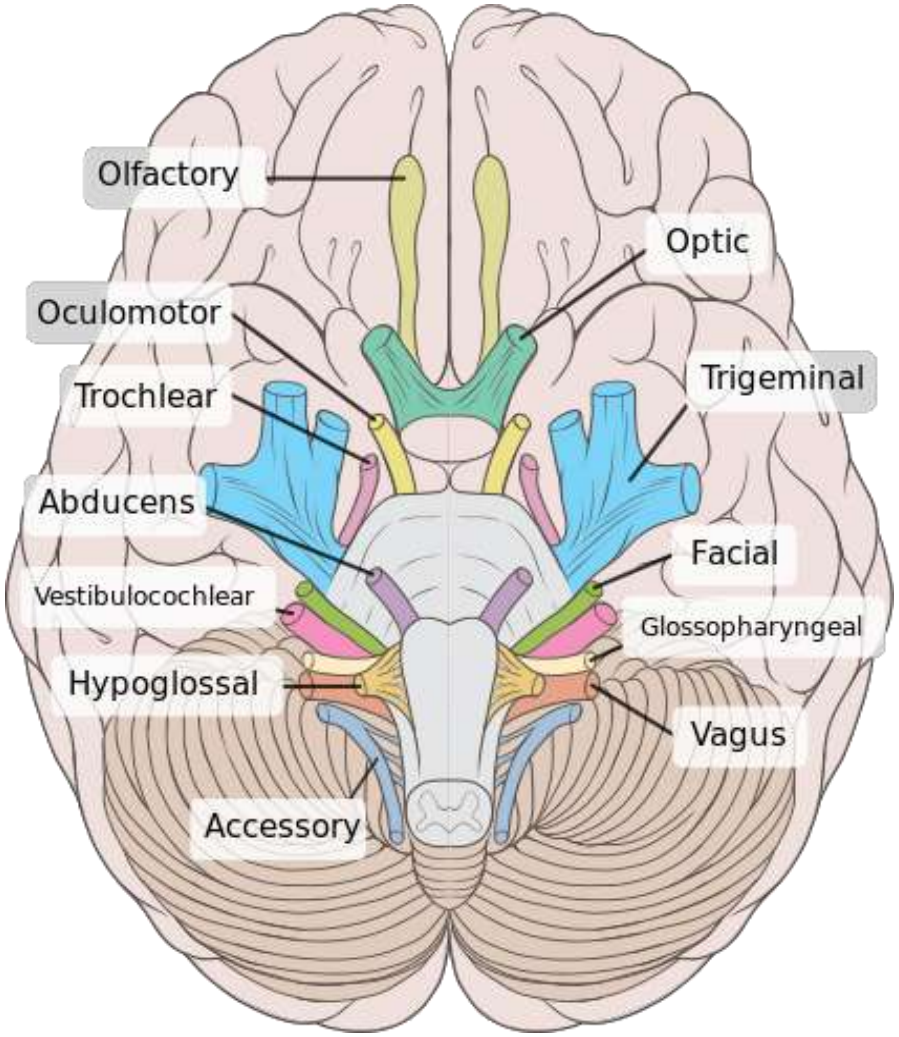
Autonomic arousal

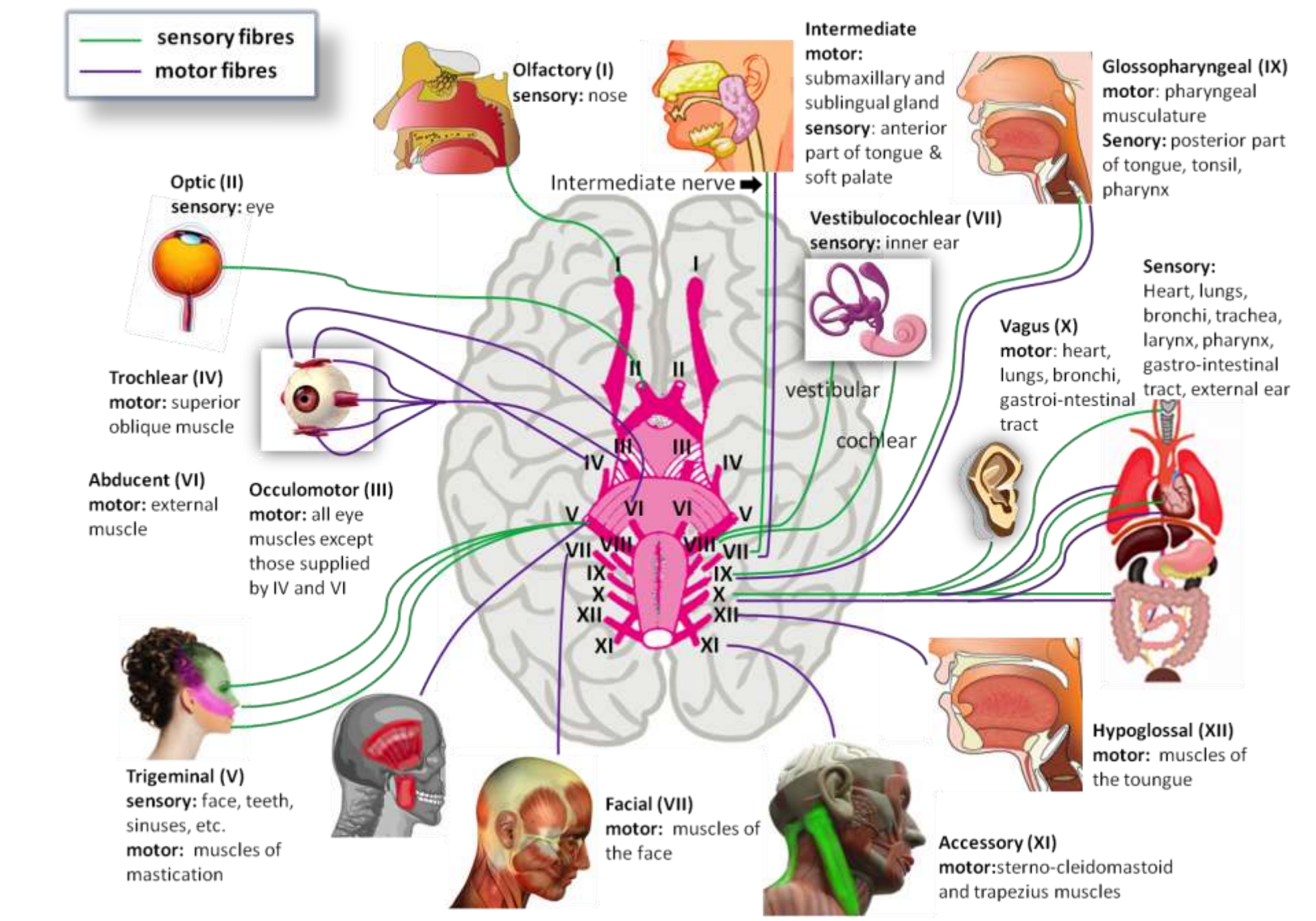
- Sensation of future threat which is beyond control
- Stress response heightened
- Fight, flight, fright, freeze, fall, feigned death
- In the absence of imminent threat
- Experienced as terrifying images without language or spechless terror

Triggers

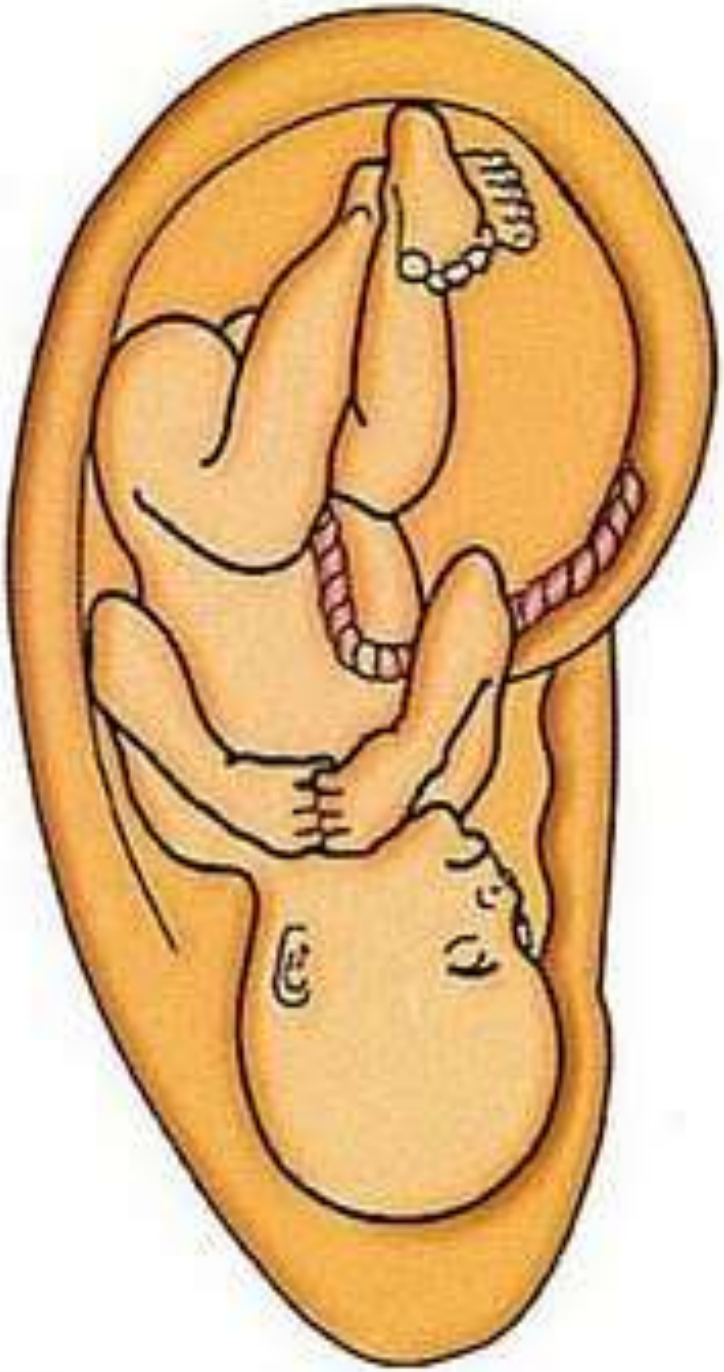
- Place
- Smell
- Sensation
- Texture
- Taste
- Touch
- Anniversary
- Memory thought or feeling

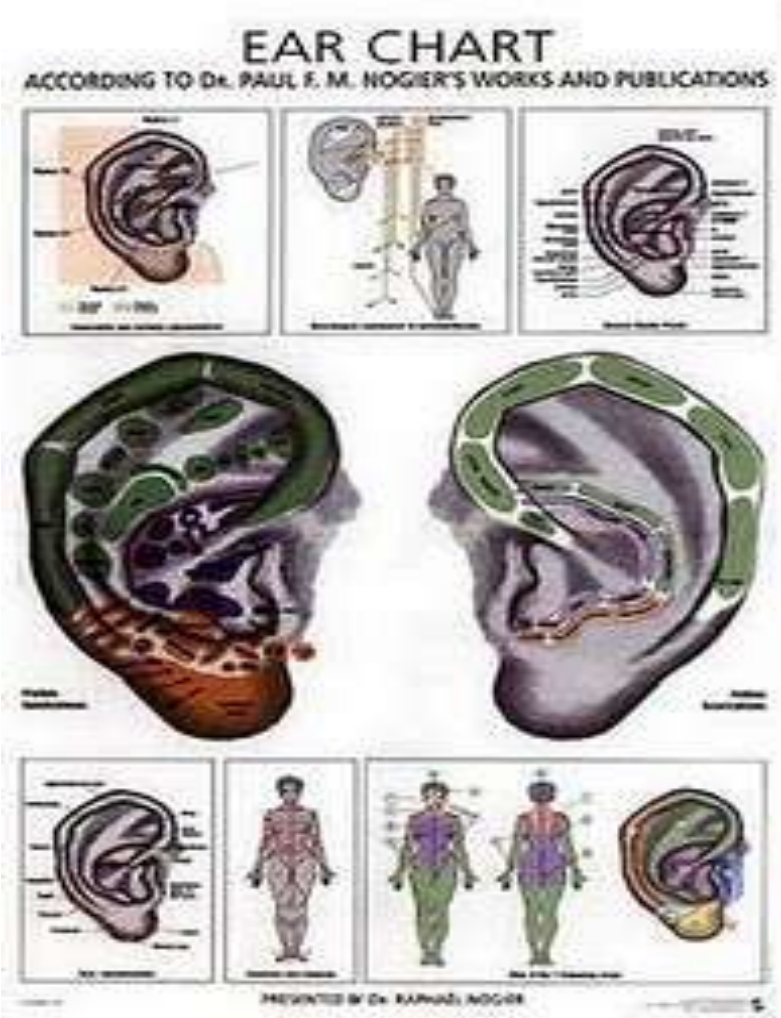
Cranial nerves origin from stem of brain





AURICULOMEDICINE and A.N.SYSTEM





Sensitization & Kindling

- Minor cues activate L- HPA axis
- Trauma reexperienced physiologically and psychologically
- Child avoids cues or triggers to control frightening emotions sensations and feelings
- Avoidance requires hypervigilance child is always on guard with exaggerated startle reflex

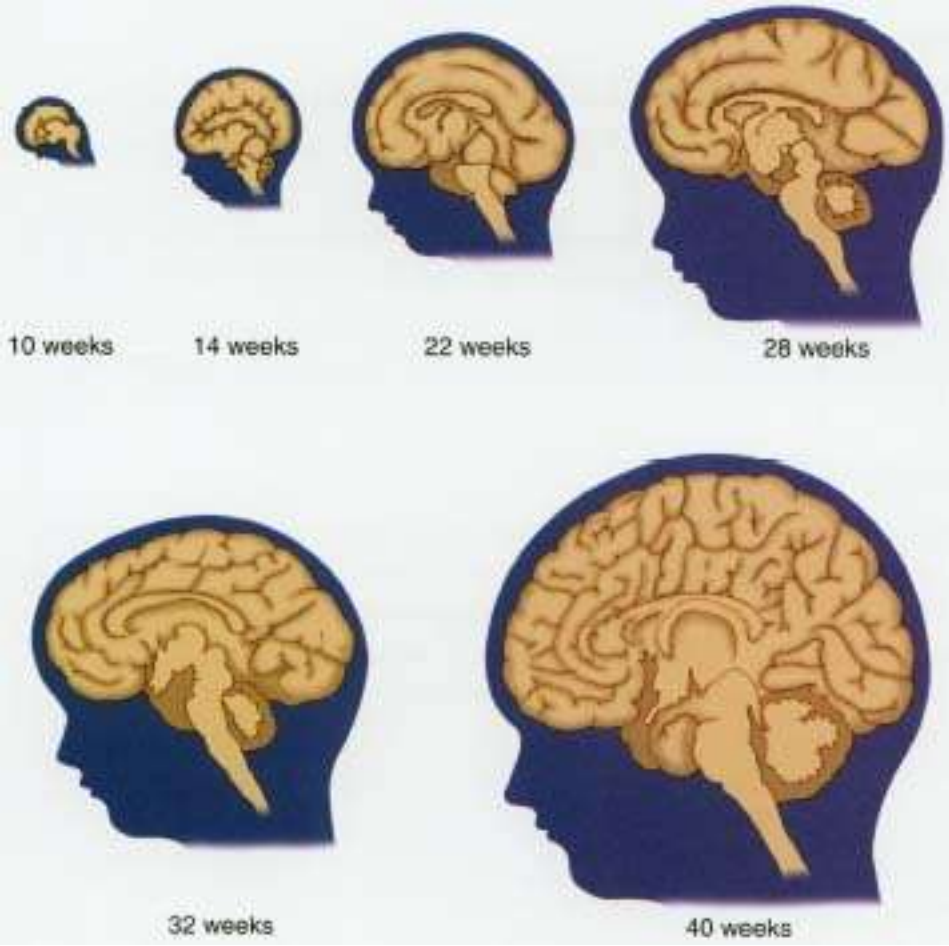
Aetiology

- Genetics 30% inter generational transmission of trauma
- Glucocorticoid receptor
- Cannabinoid receptor
- Corticotrophin releasing hormone receptor
- Gene and forkhead binding protein 5
- Neuropeptide Y

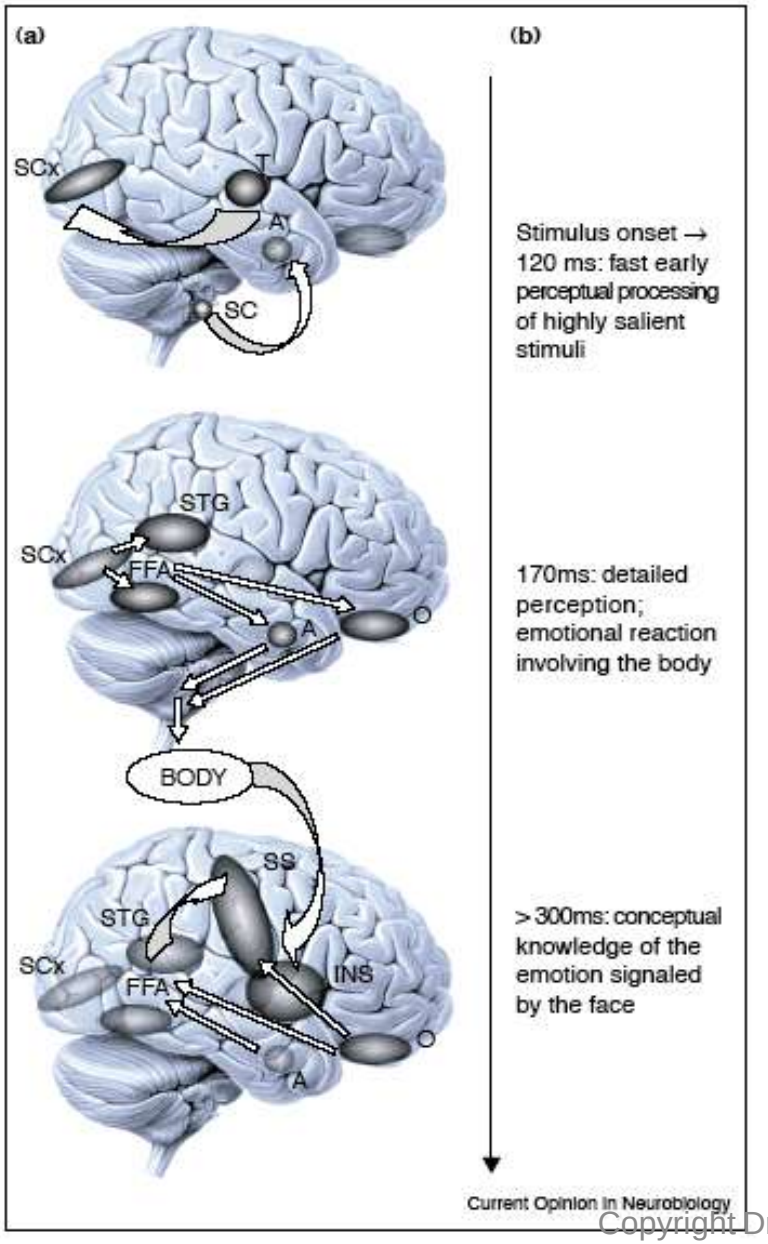
Before Birth

- Last trimester rapid myelinization
- Stress nutritional status
- Lack of oxygen
- Low birth weight
- Baby responds to cortisol from placenta with stress disorders and as adult Diabetes Cancer & Hypertension
- Stressed mother may = stressed baby

Synaptic potential of baby's brain through pregnancy



Different Neural Systems At Different Time Points: Amygdala & OFC



Early processing of salient stimuli. Subcortical route feed-back to OC. Bottom-Up Process

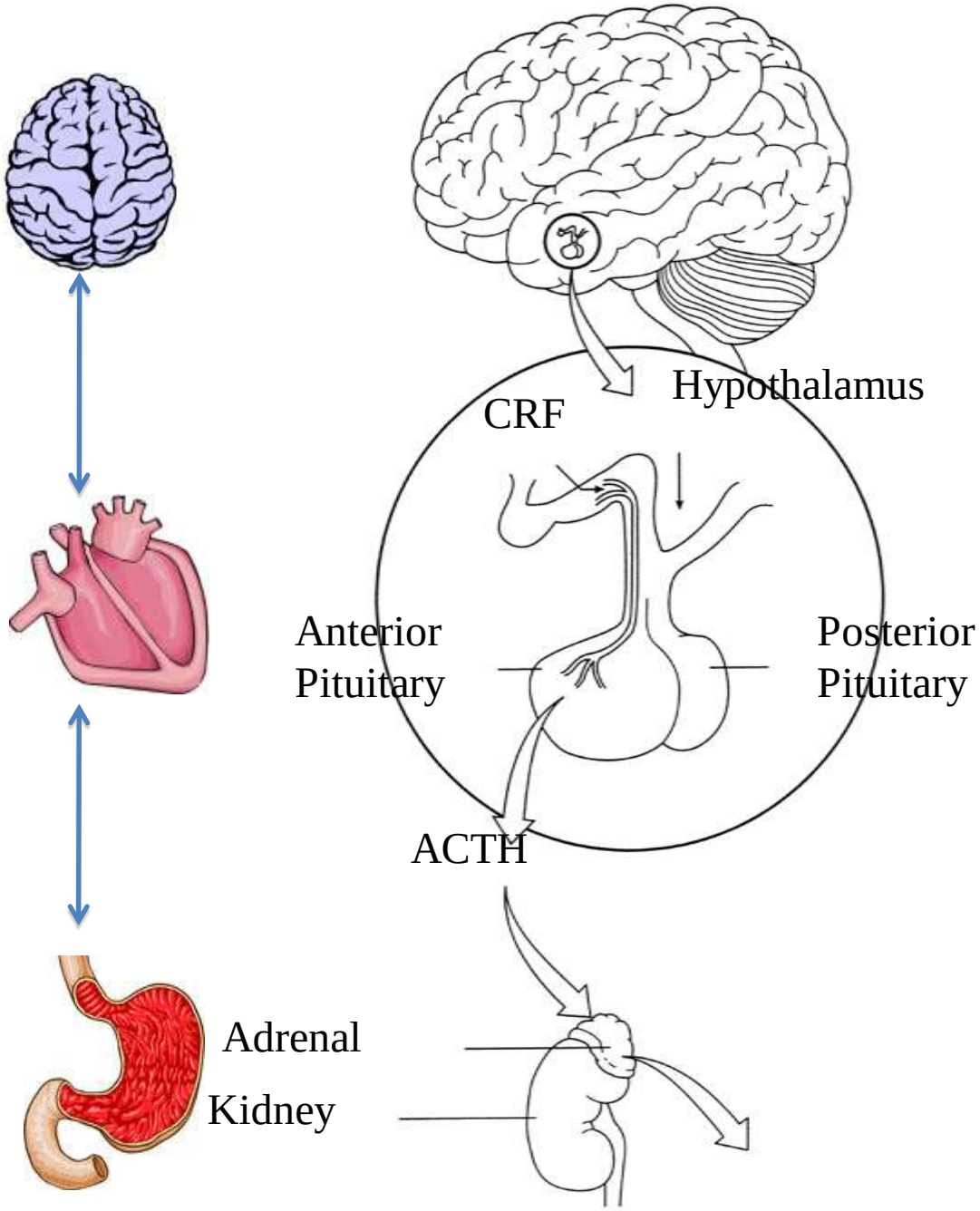
Detailed perception through Core system and emotional reaction (OFC).

Interaction between visual and somatosensory areas in recognition of facial emotion, and possible simulation.

Top-Down Process

Adolphs (2002)

PTSD

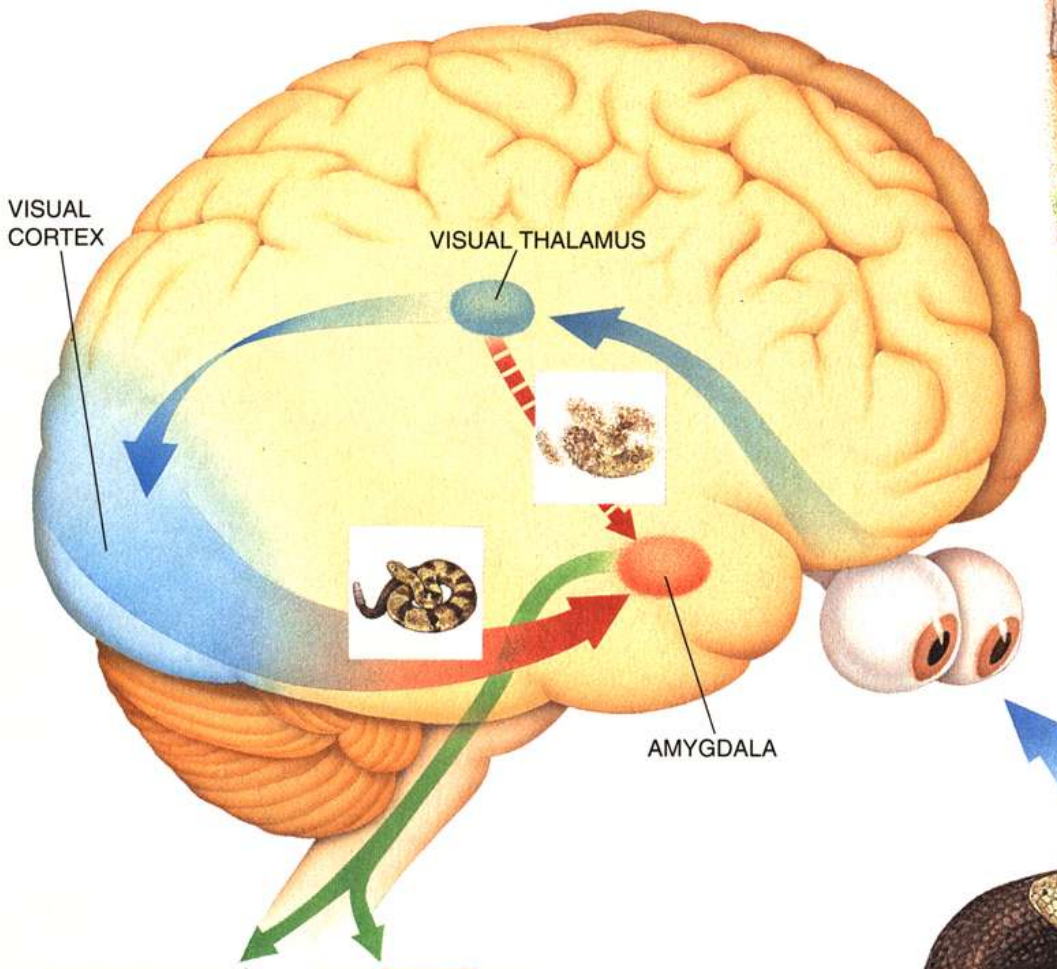


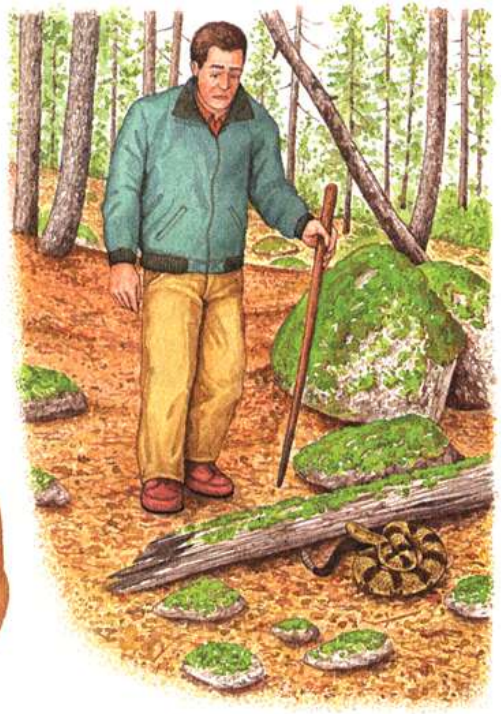
↑ Nor epinephrine

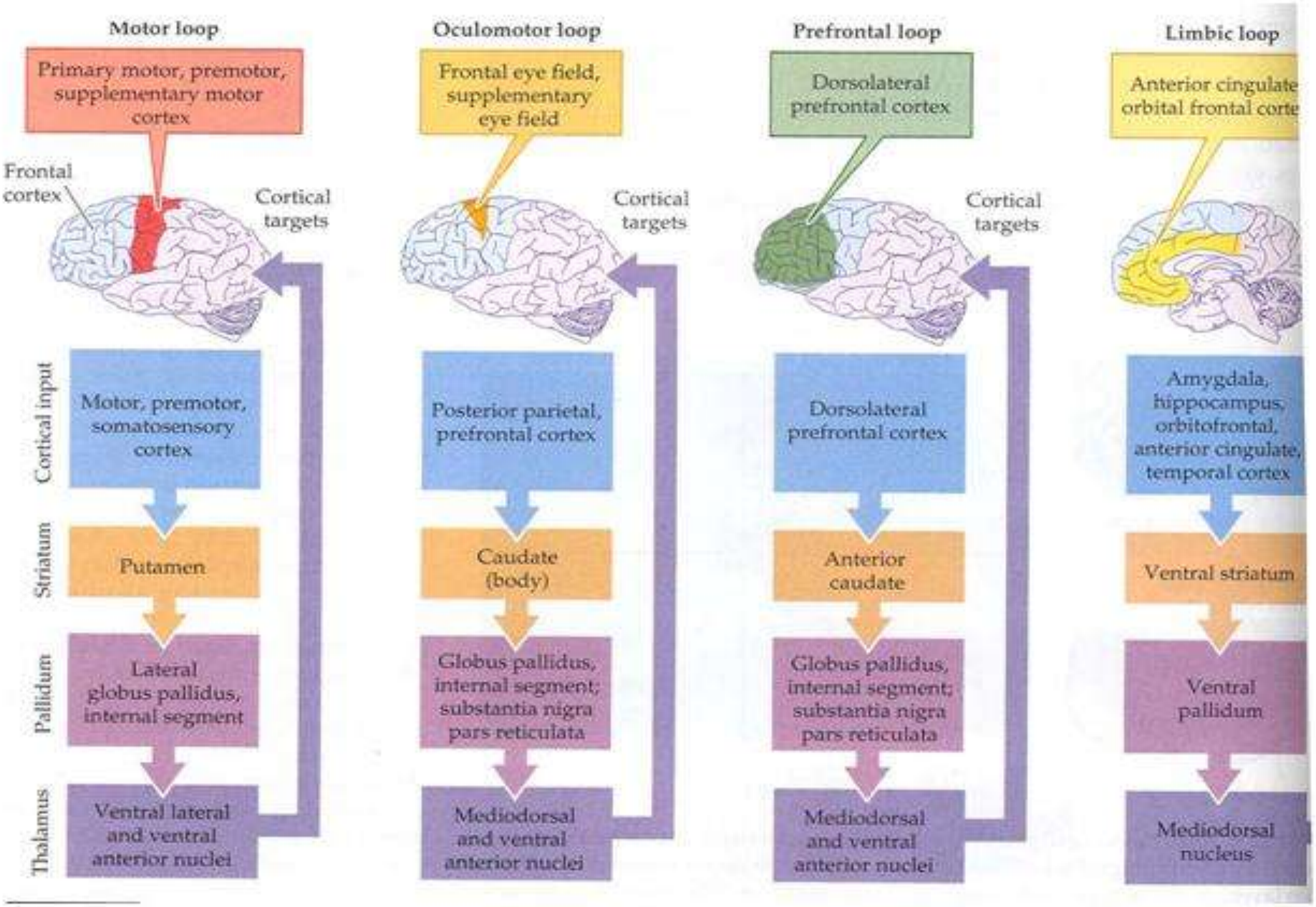
Chronic stress

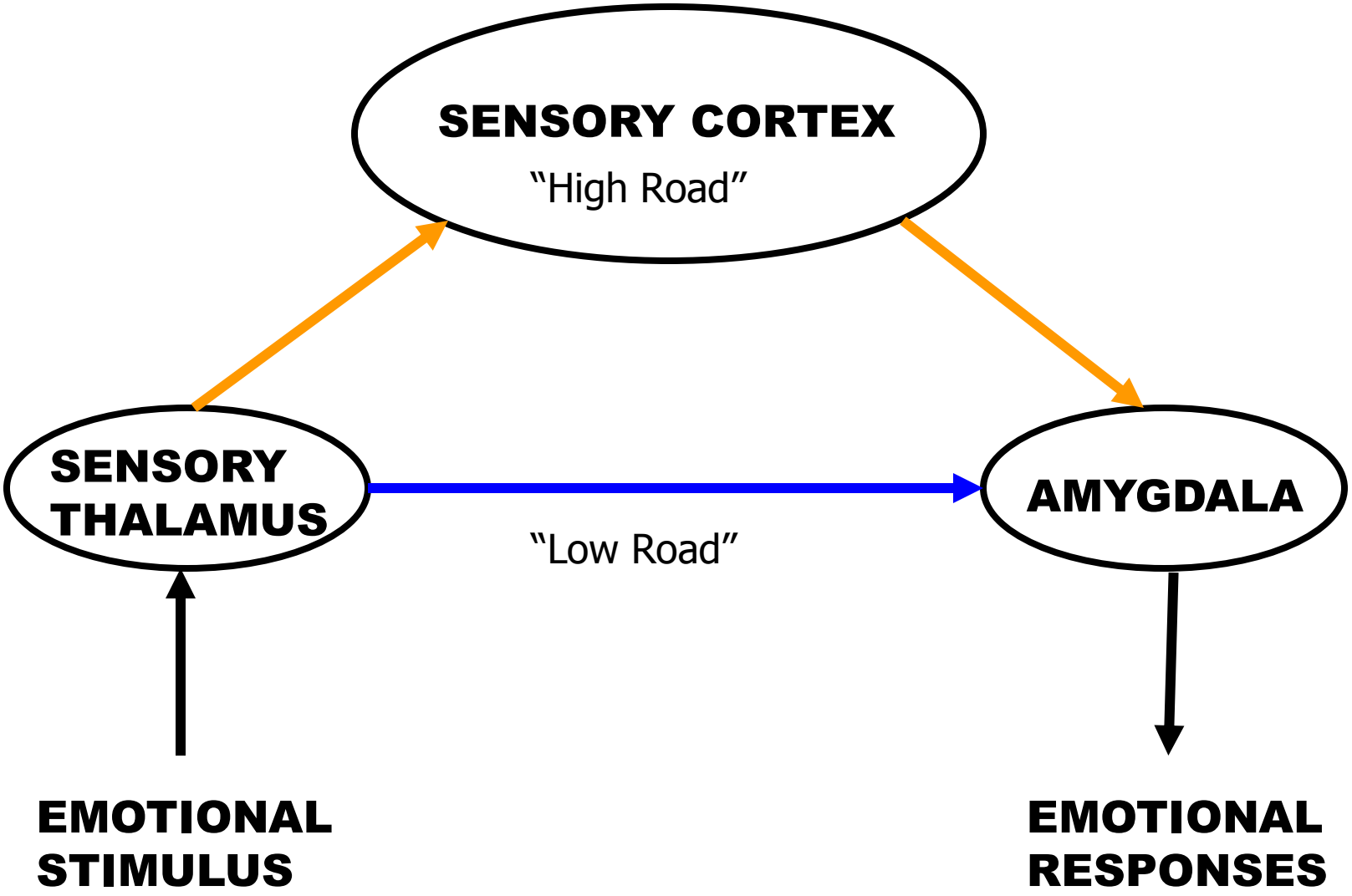
↑ Cortisol

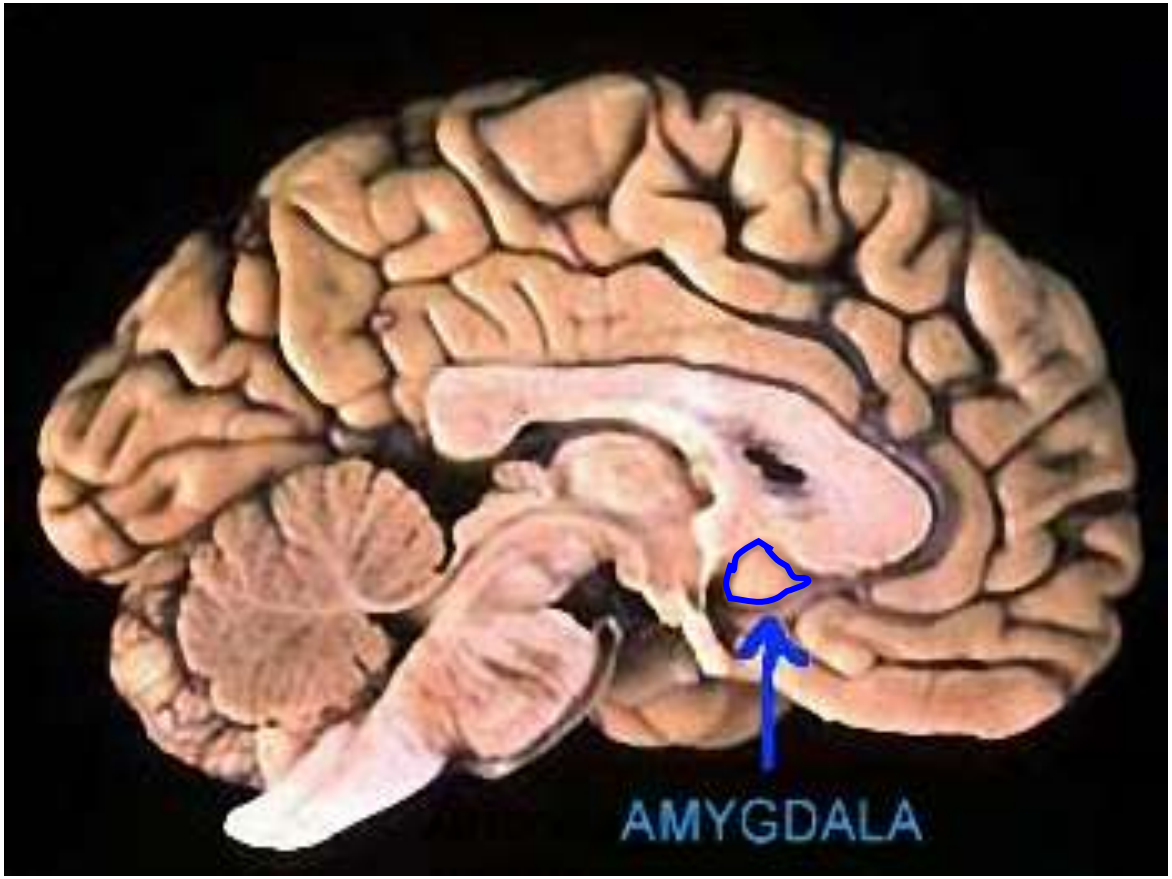
LeDoux, Scientific American, 1994

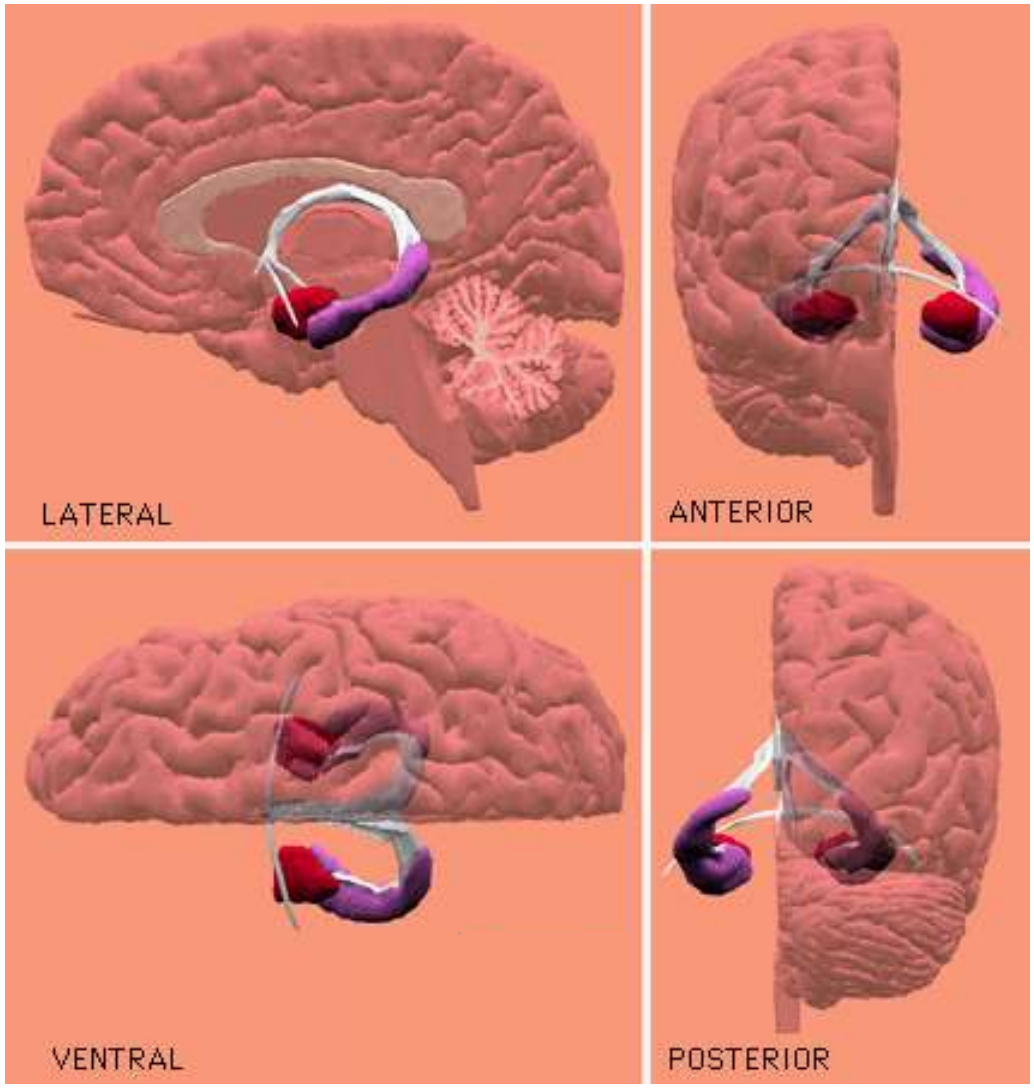












"Battlemind"

- In a dangerous situation you don't want to sit around and think. You want to act immediately using your amygdala and bypassing your frontal lobe.

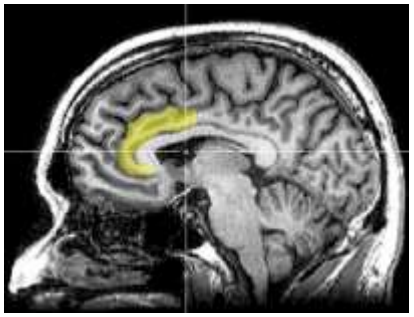
- In PTSD the brain acts like you are in a dangerous situation all the time. The amygdala is hyperactive and the frontal lobe functions poorly.

- Anger and poor concentration are related. They are both part of hyperarousal.

Neuroimaging in PTSD

- Amygdala – hyperactivity, responsivity is associated with PTSD symptom severity
- Frontal cortex – volume loss, responsivity is inversely associated with PTSD symptom severity
- Hippocampus – volume loss, decreased neuronal and functional integrity

Anterior cingulate cortex



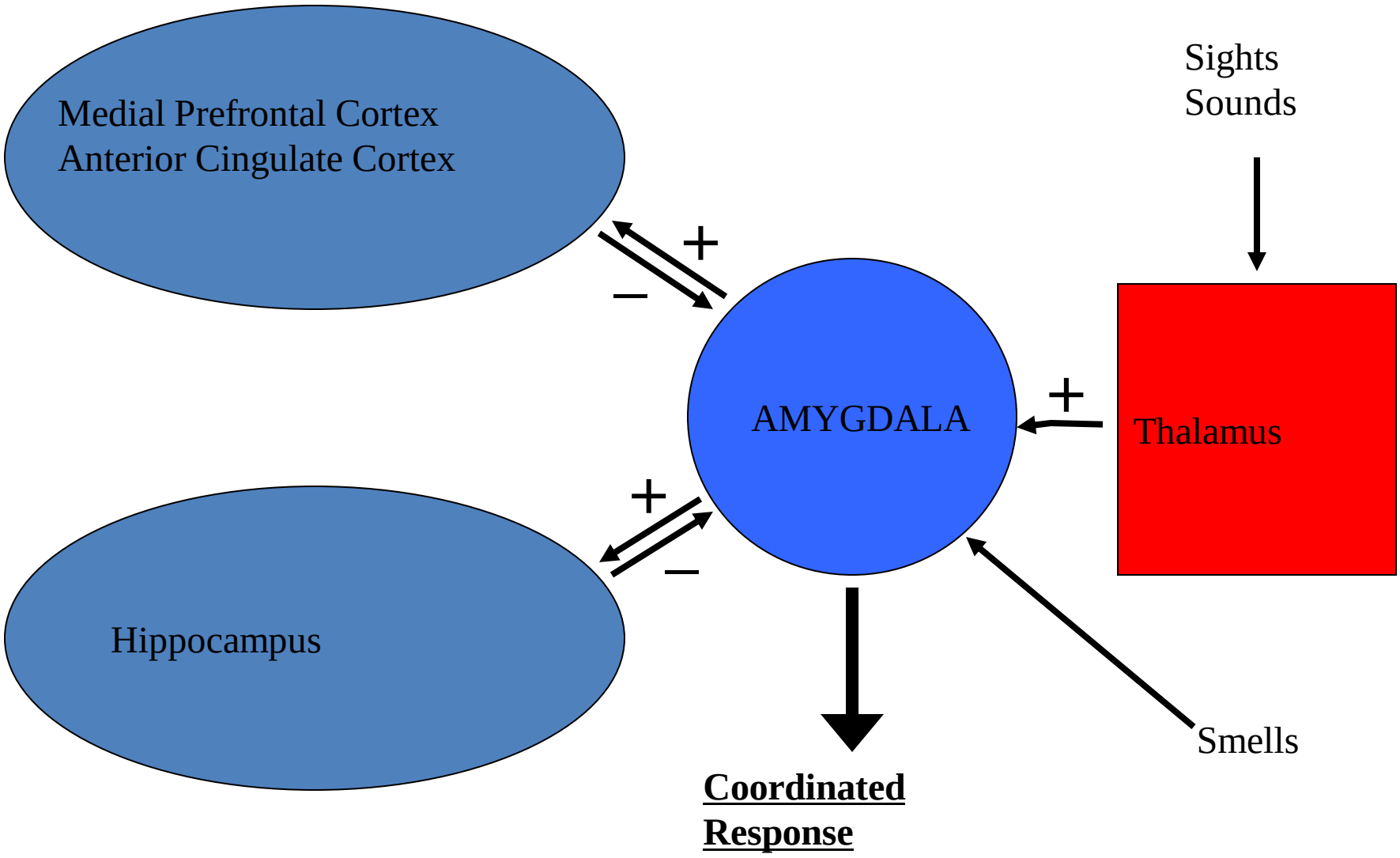
- Interprets emotional stimuli and processes responses
- Sympathetic ANS – “accelerator”
- Parasympathetic ANS – “brakes”
- Anterior cingulate cortex – “clutch”

“Speechless Terror”

- Suppression of Broca’s area during traumatic reexperiencing (Rauch et al.)
- Construction of narrative promotes reencoding of traumatic memories
- Subcortical memories - somatosensory
- Cortical memories – verbal, symbolic

Sri Lanka

Coordination of Threat Response



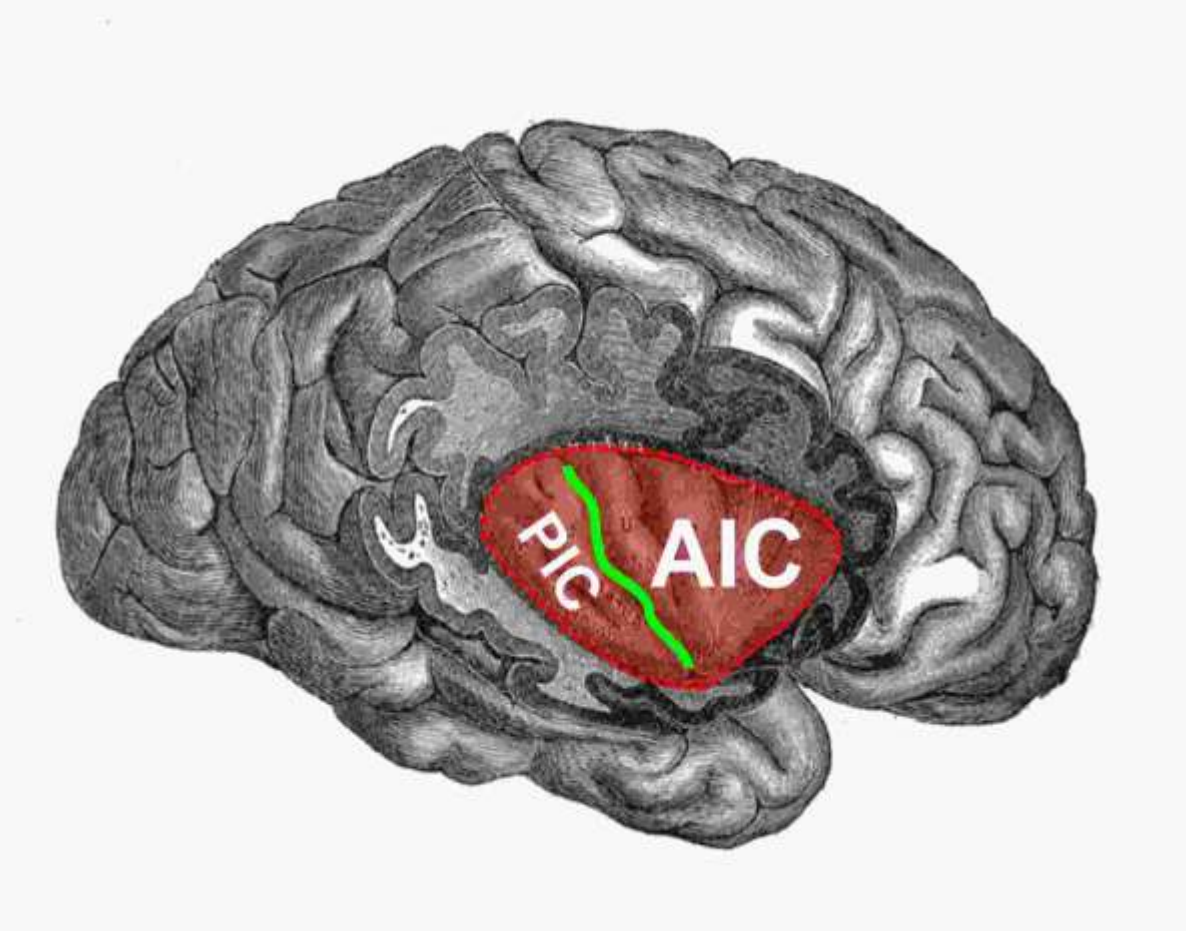
Institute of Medicine

"…scientific evidence on treatment modalities for PTSD does not reach the level of certainty that would be desired for such a common and serious condition among veterans… additional high quality research is essential for every treatment modality."

Treatment guidelines

- Treating people with PTSD is both challenging and rewarding.
- Success requires creativity, flexibility, compassion, and clinical skill.
- Be aware of secondary traumatization.

Insular cortex



Processing of internal bodily signals (interoception).

Integration of mental map and sensory information to create sense of self.

My Dissociation Model (2011)

RAPIDS

HYPERAROUSAL + DISSOCIATION

- Racing thoughts
- Affect dysregulation
- Personality parts
- Impulsivity
- Dissociation
- Somatization

WATER

INTEGRATION OF EMOTIONAL STATES

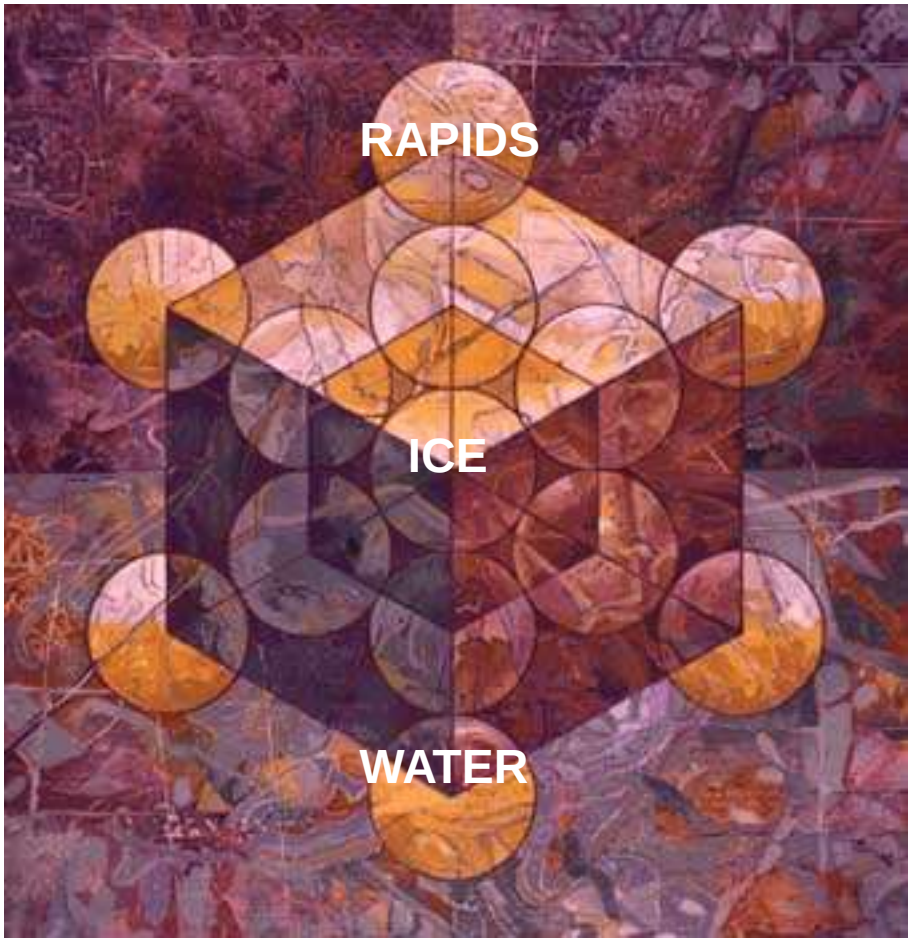
- Window of
- Affective
- Tolerance &
- Emotional
- Regulation

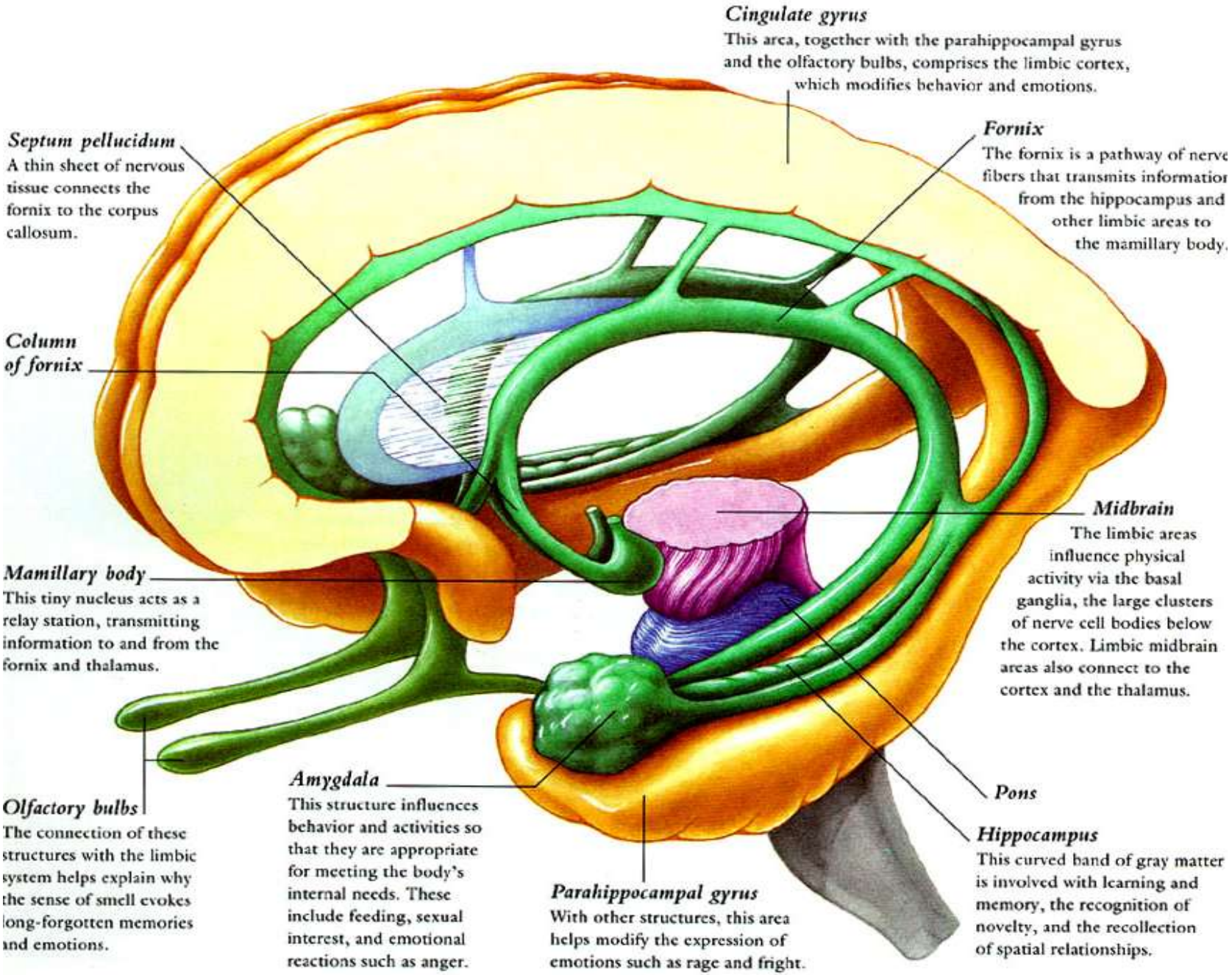
FROZEN

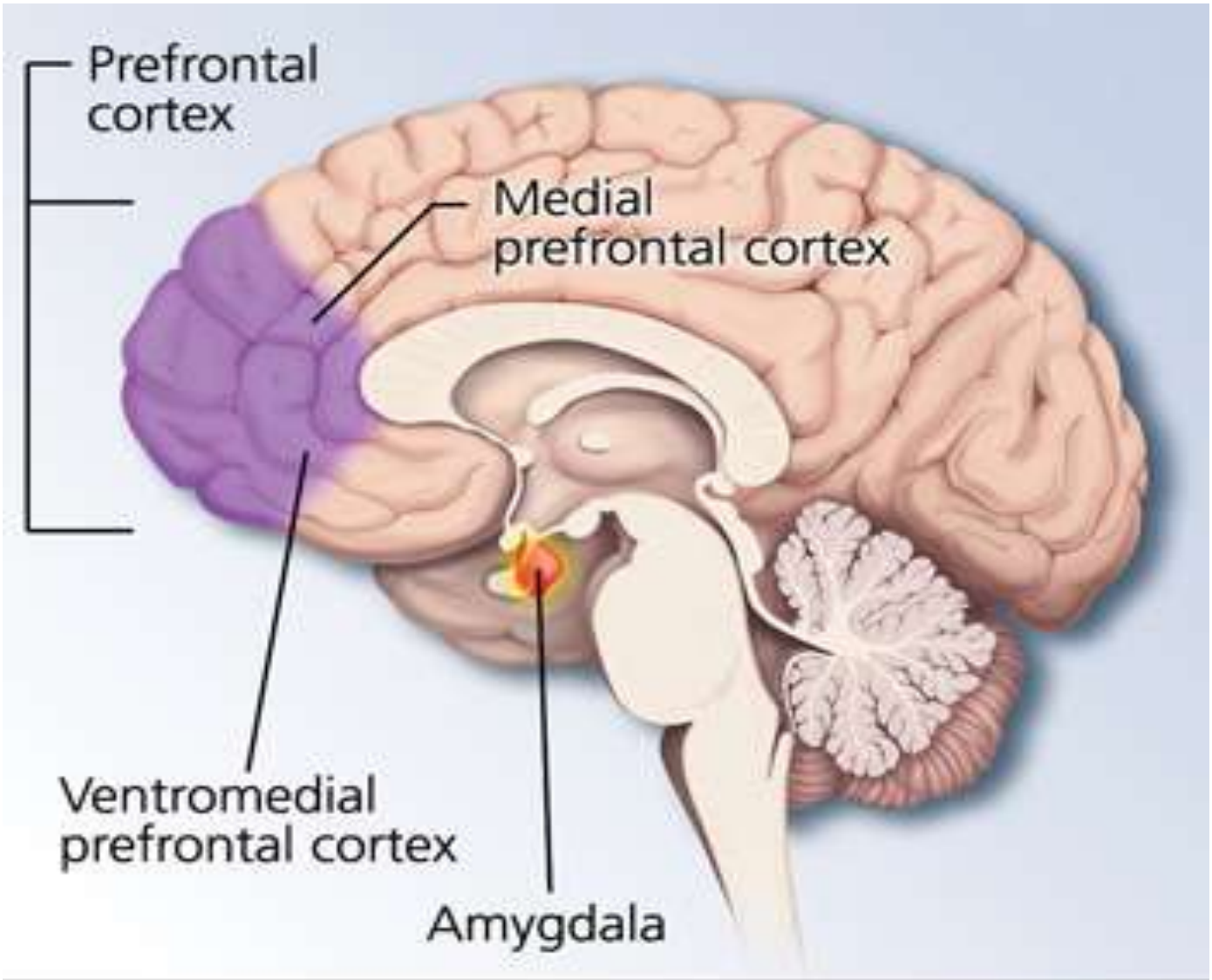
HYPOAROUSAL - DISSOCIATION

- Freeze
- Reaction
- Oblivious
- Zombie like
- Emotionally
- Numb

Biology of Perception

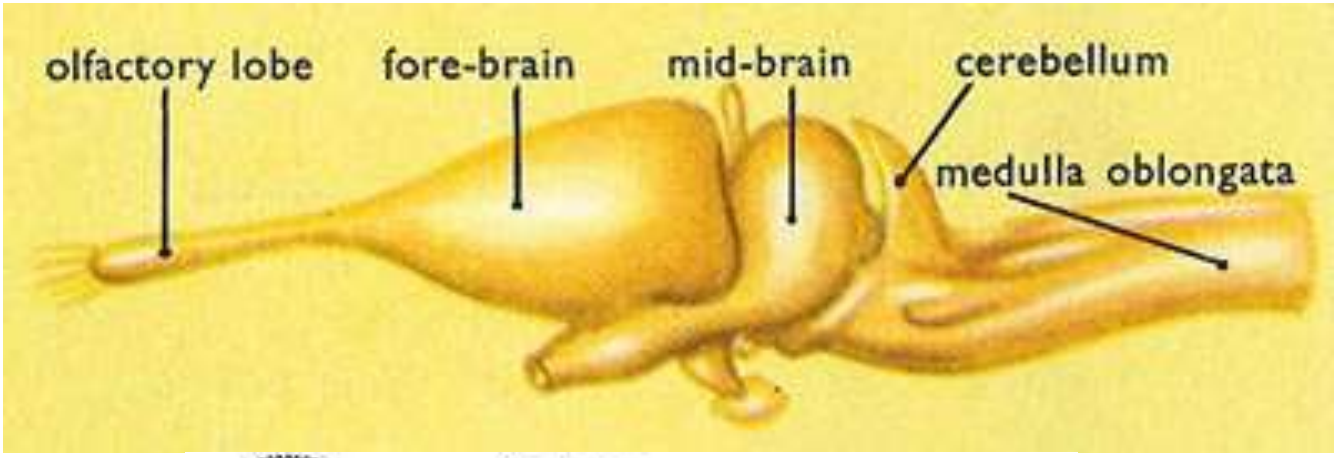


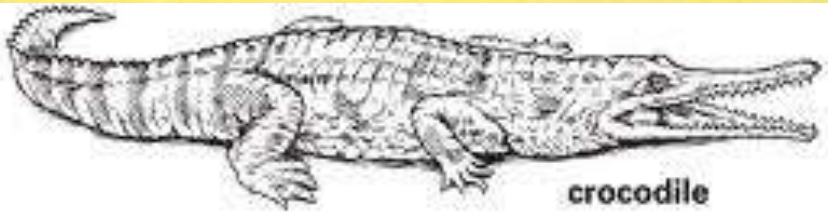


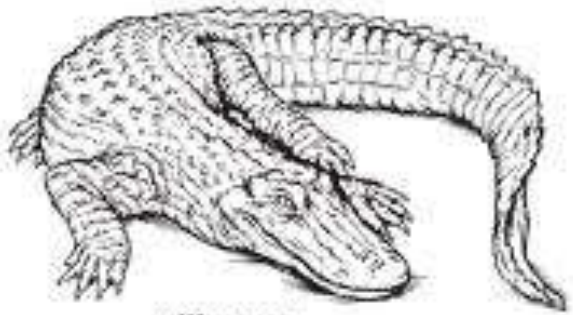


Brain Structures Involved in Dealing with Fear and Stress

Reptilian Brain*

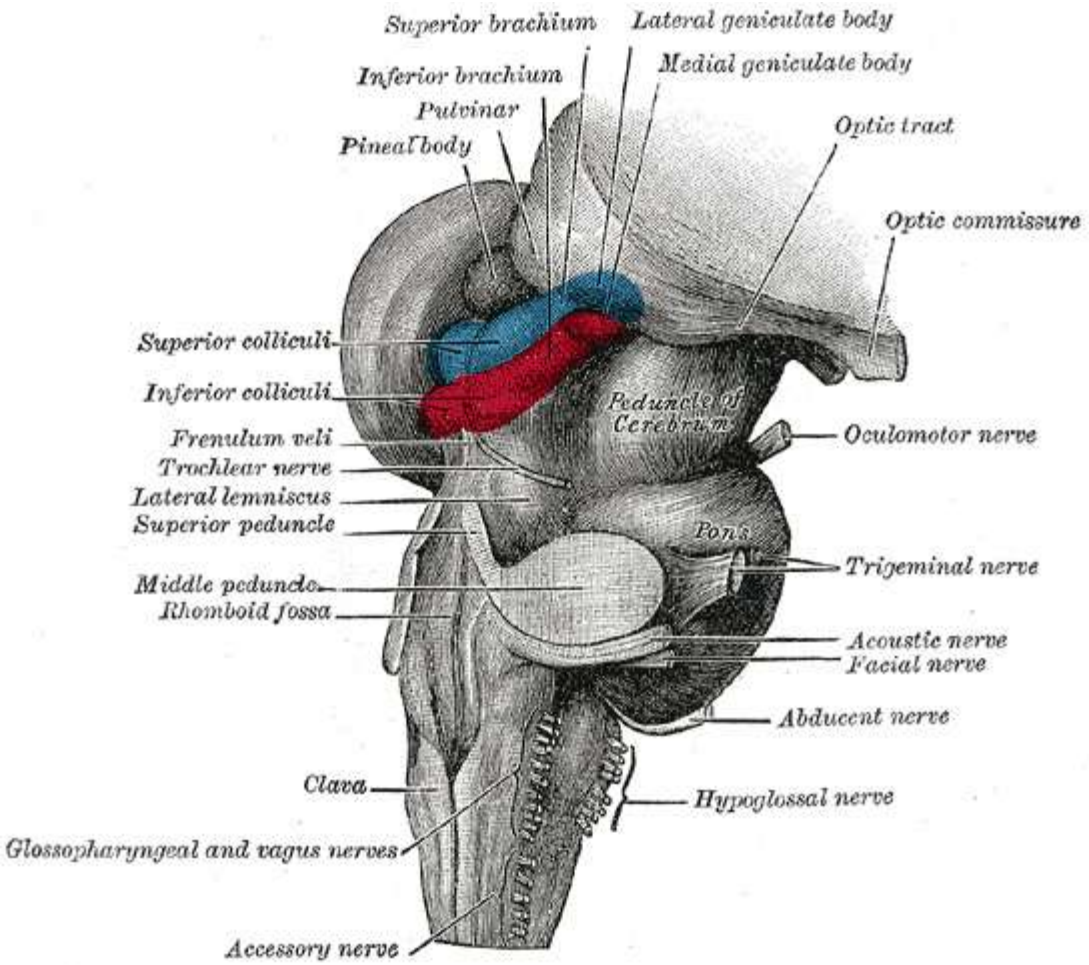




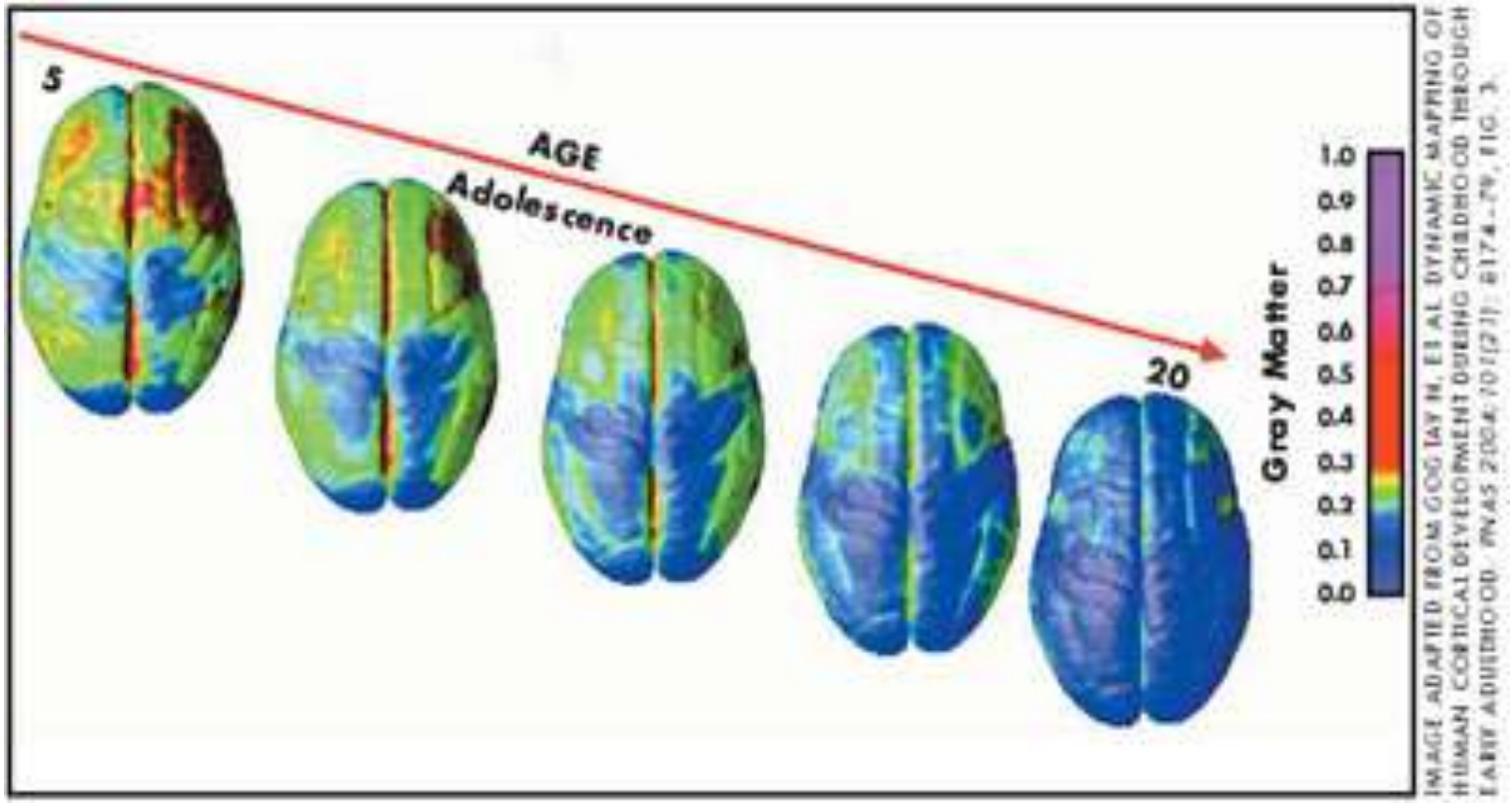


*note similarity to our brainstem which is engaged when threatened either externally or in our imagination.

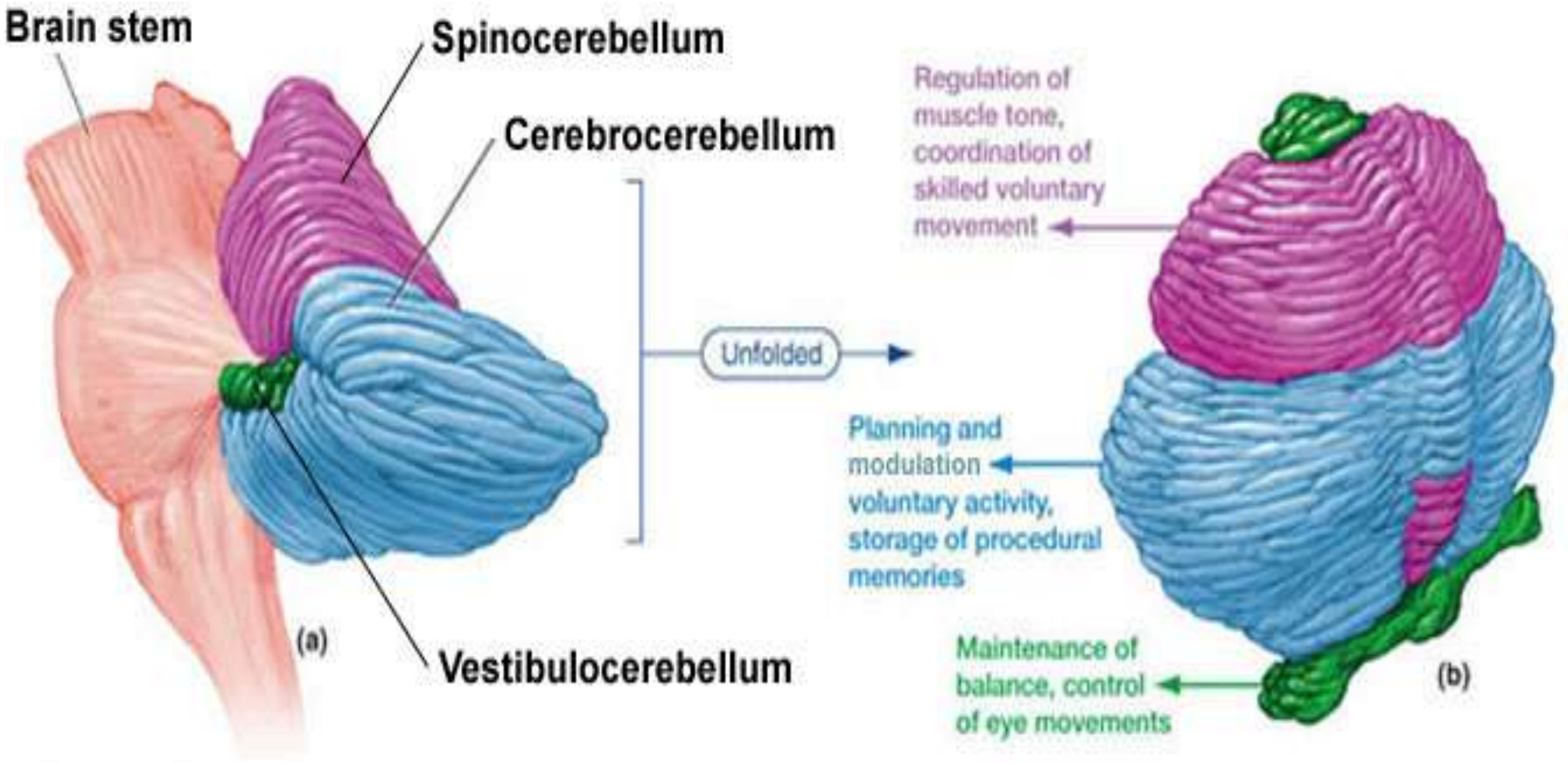
The Brain Stem



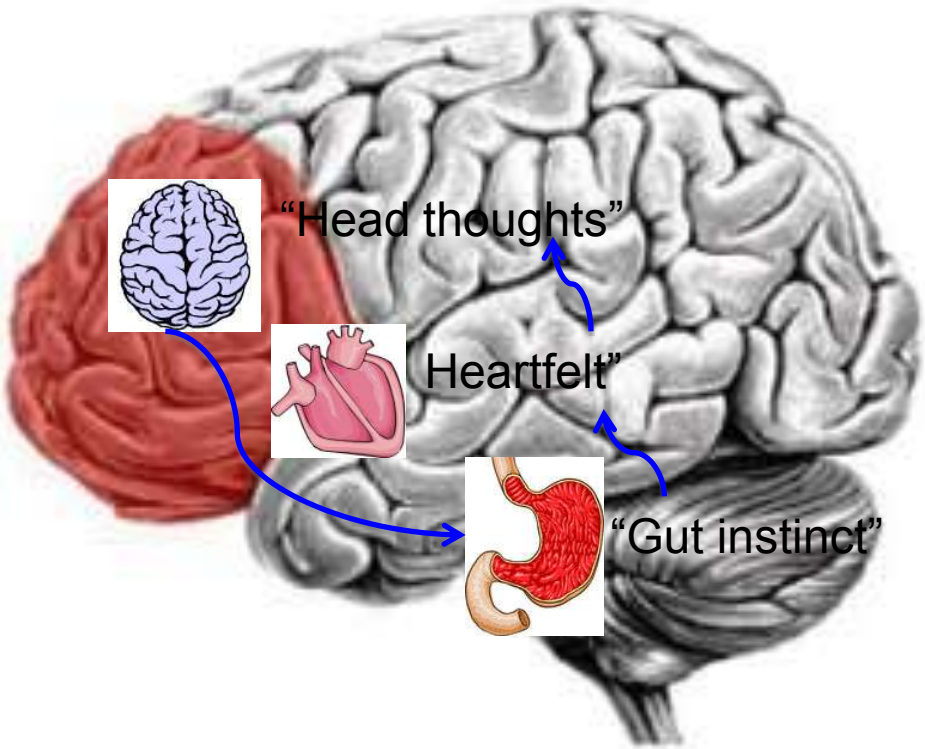
ADOLESCENT BRAIN DEVELOPMENT



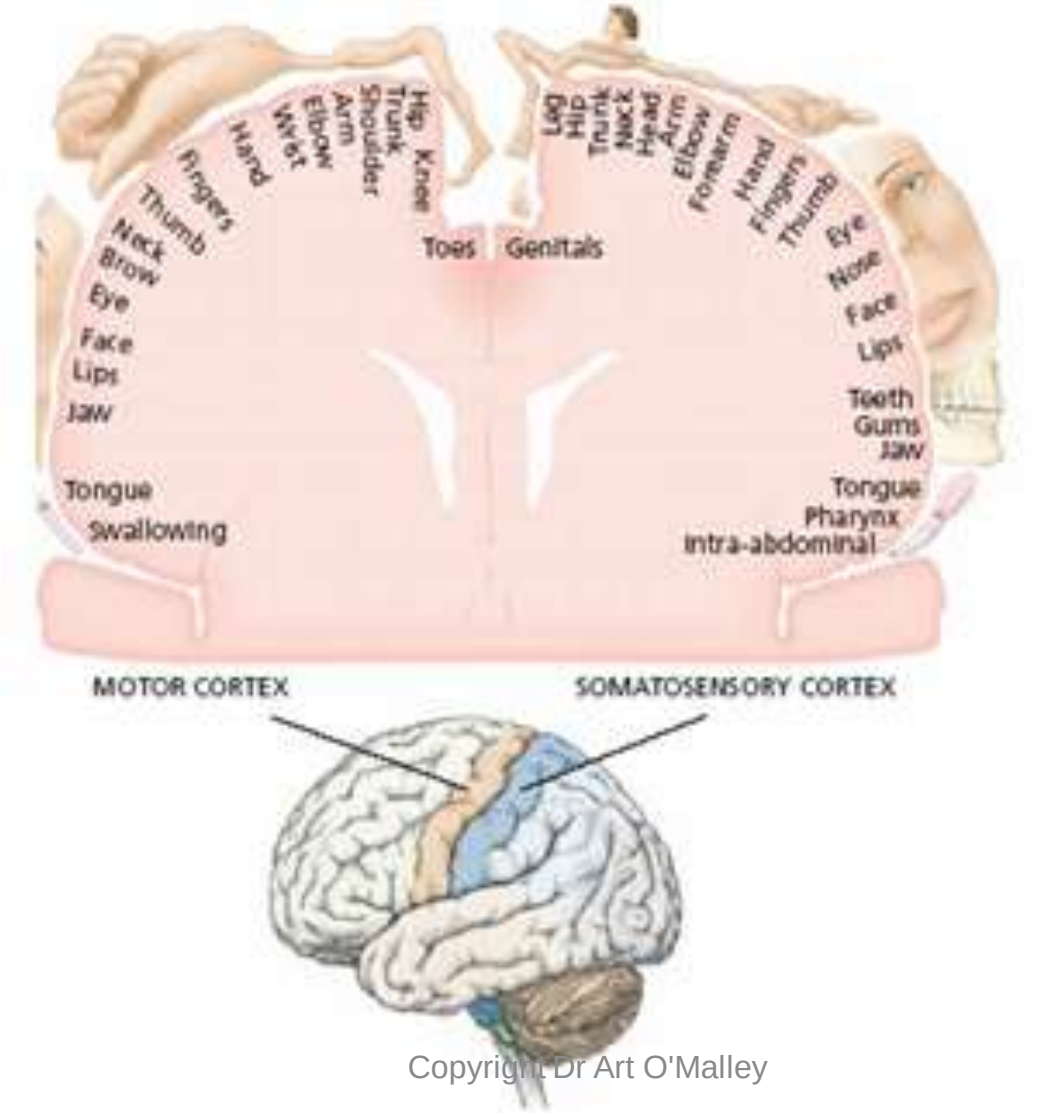
Cerebellum (Little Brain)



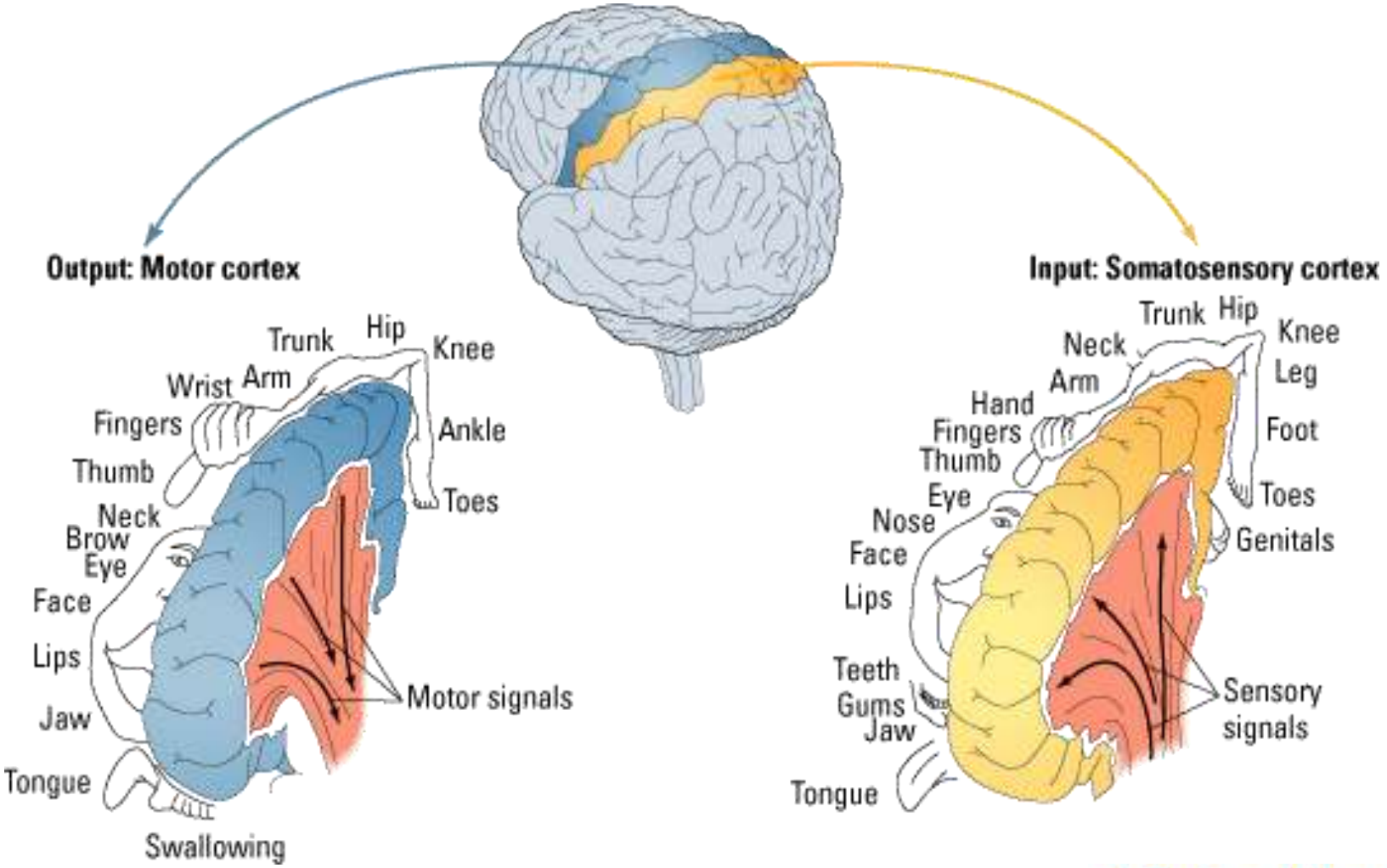
Three brains in one



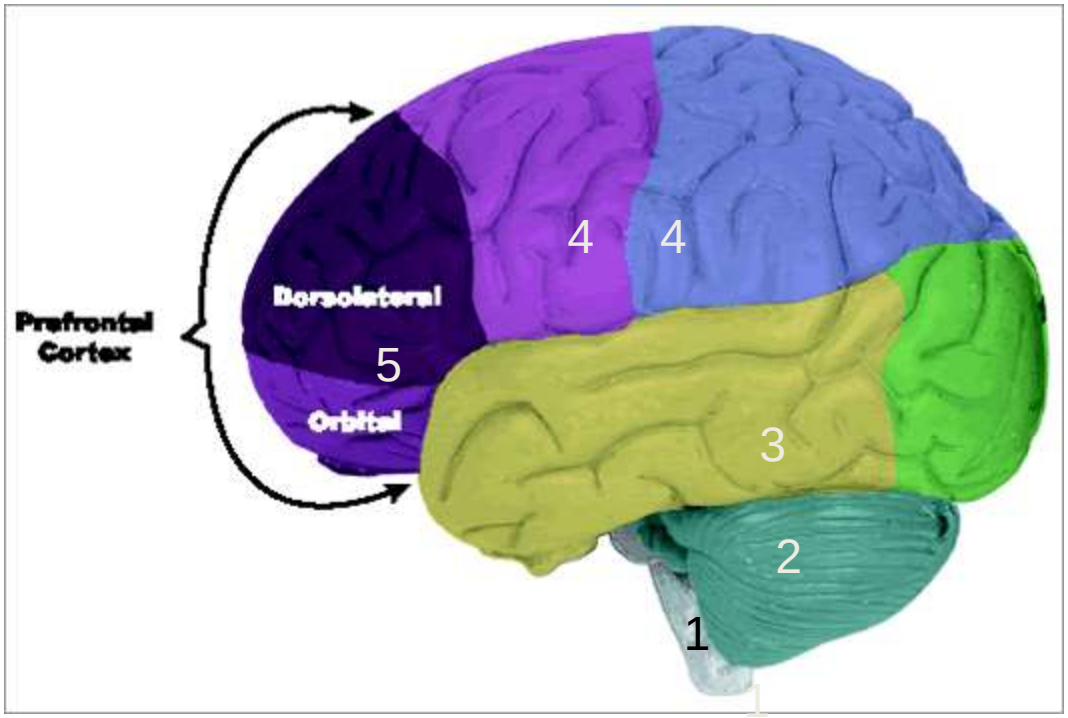
Interoceptive body maps



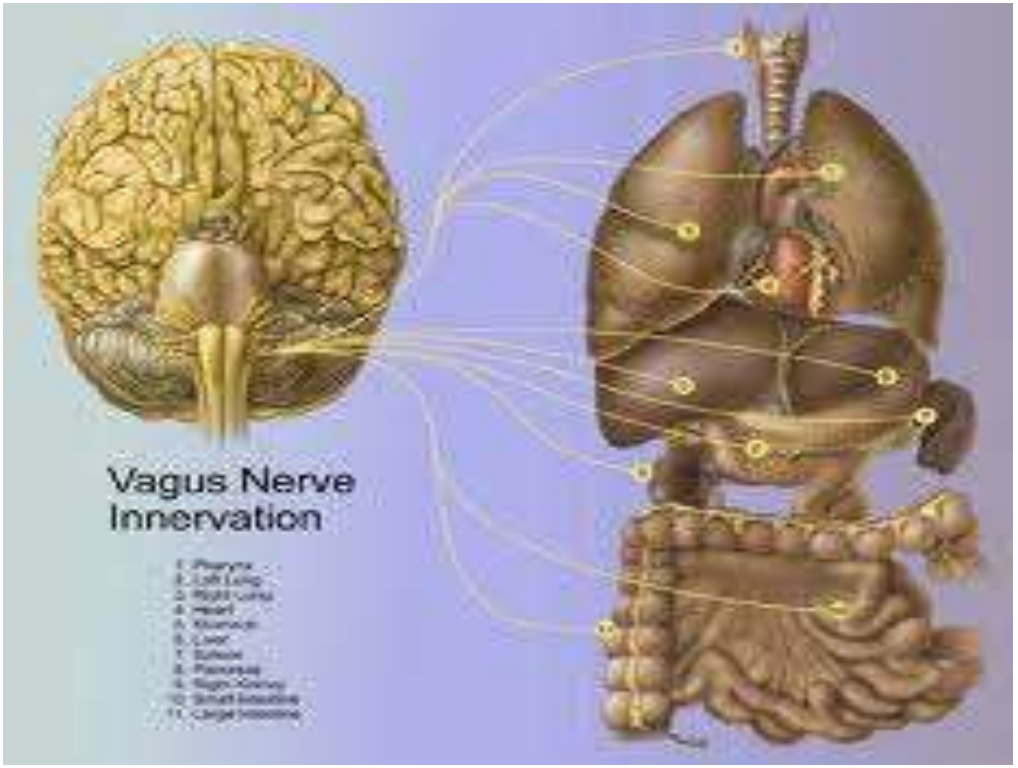
Sensory Input & Motor Output



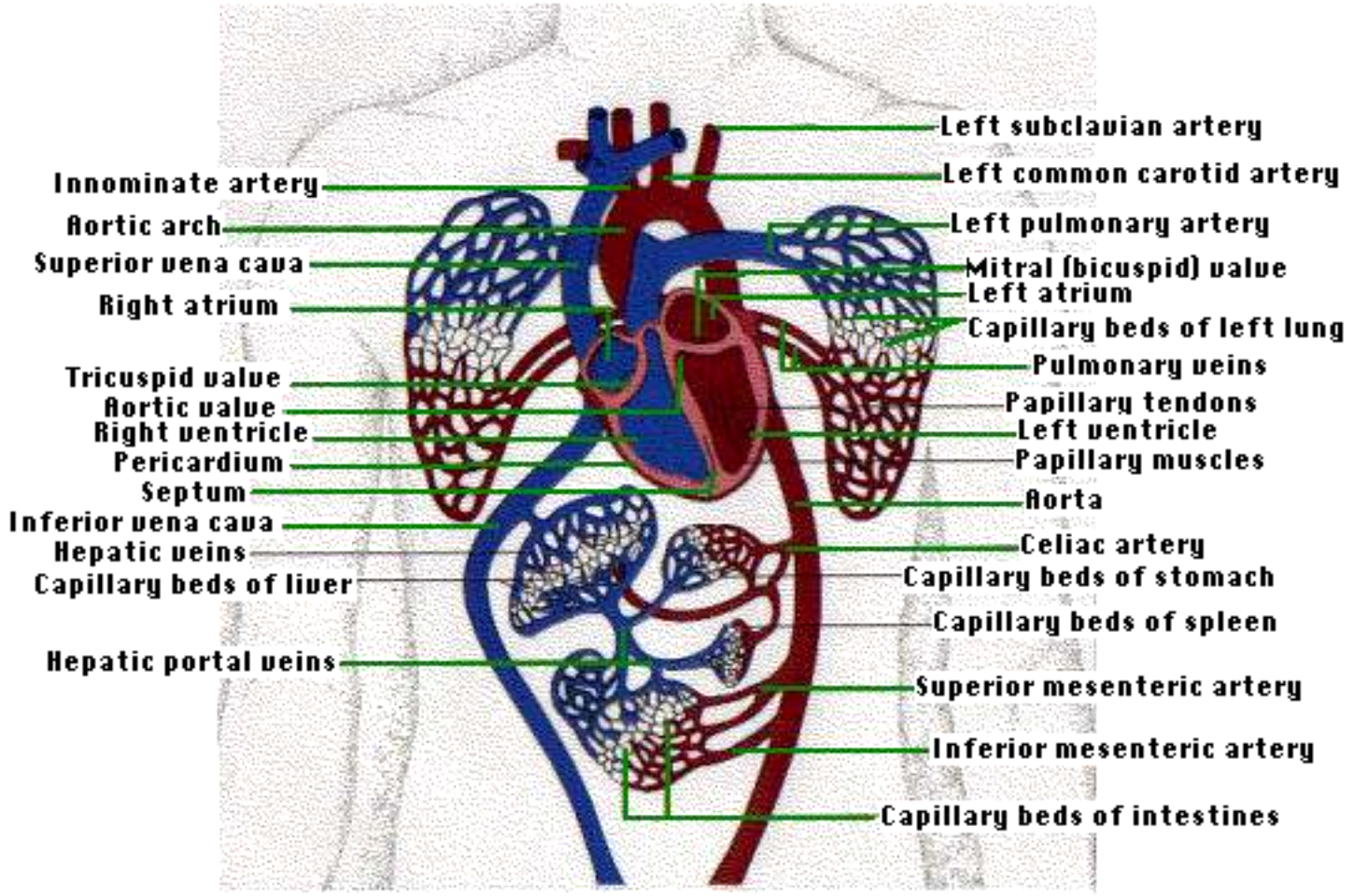
Quintessential brain (2011)



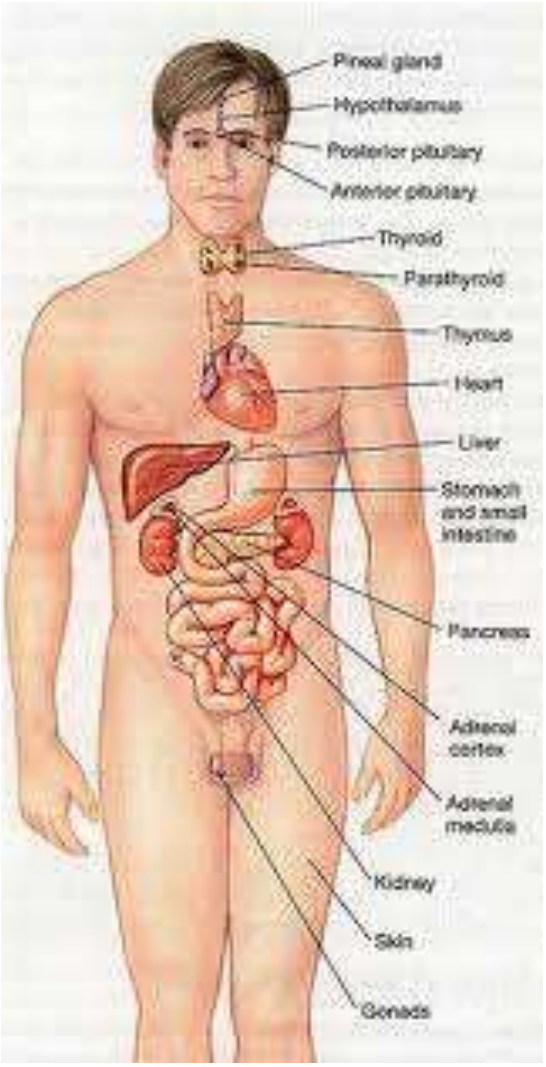
Gut-Heart-Brain Connections

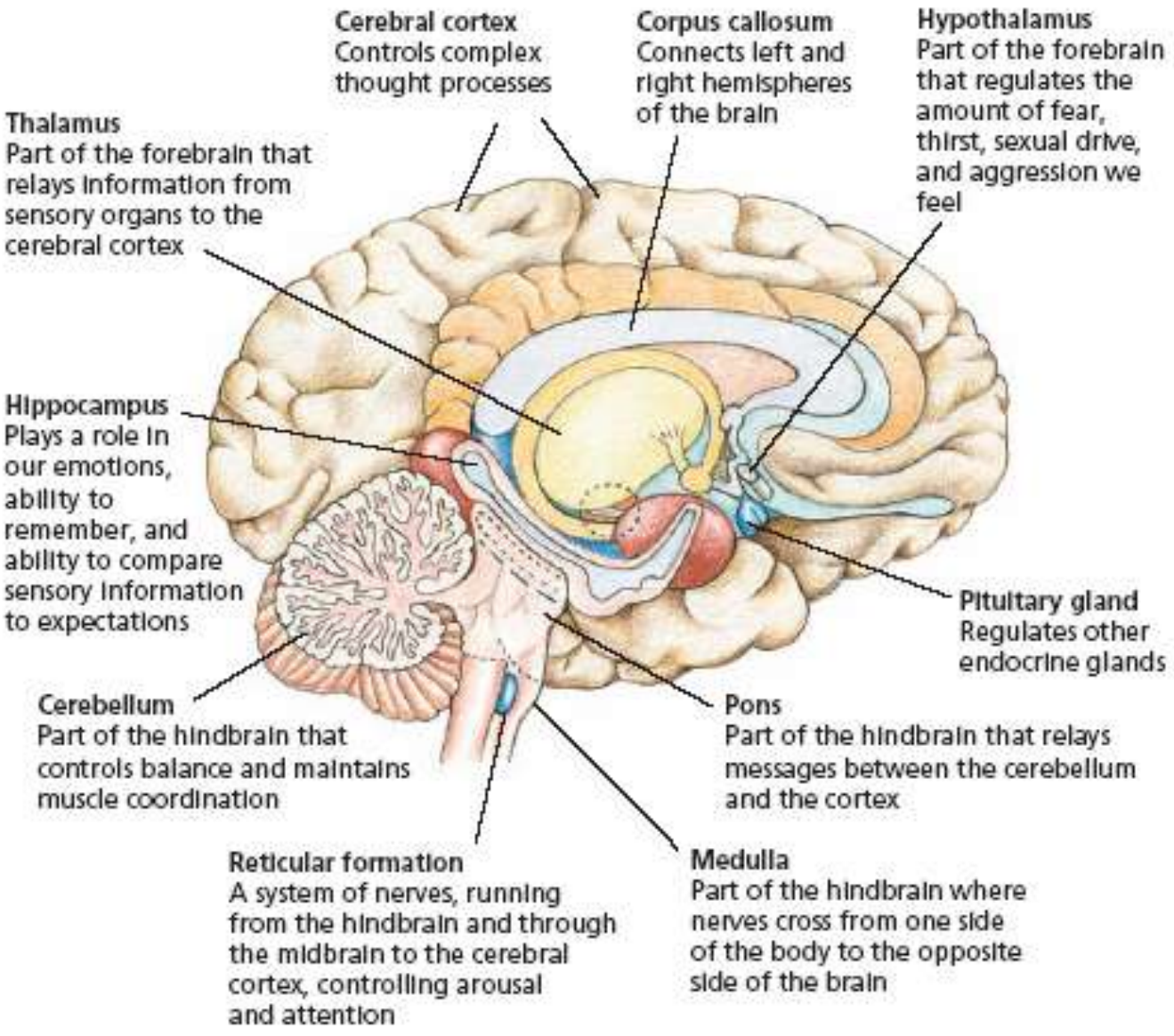


Arterial and Venous blood flow through capillaries

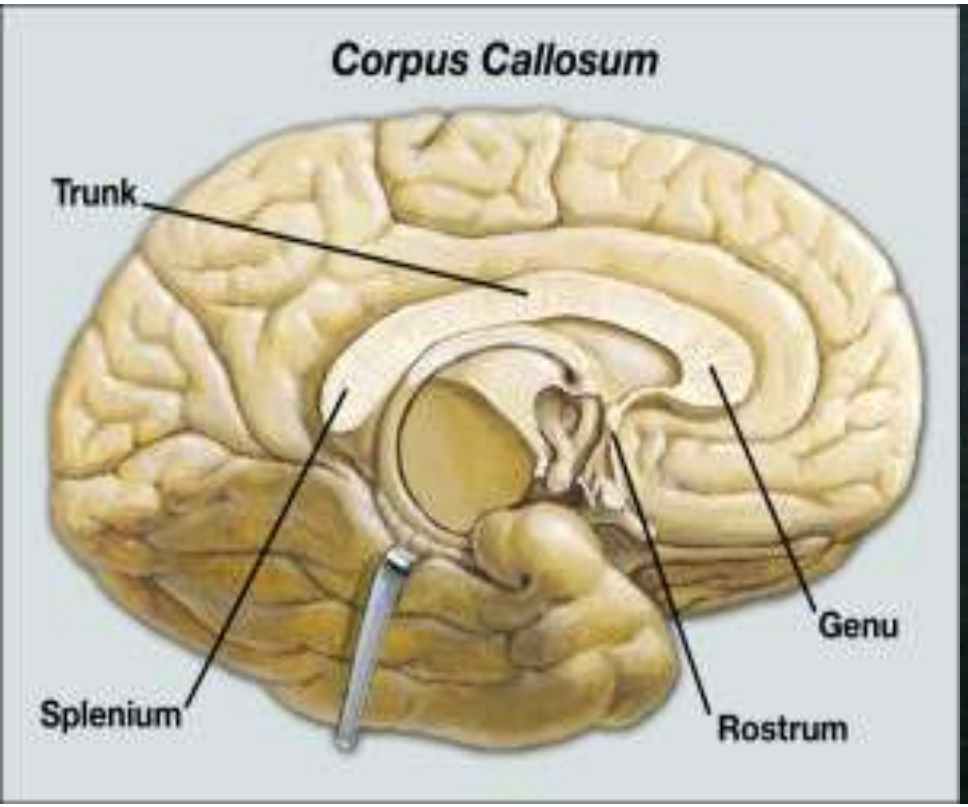


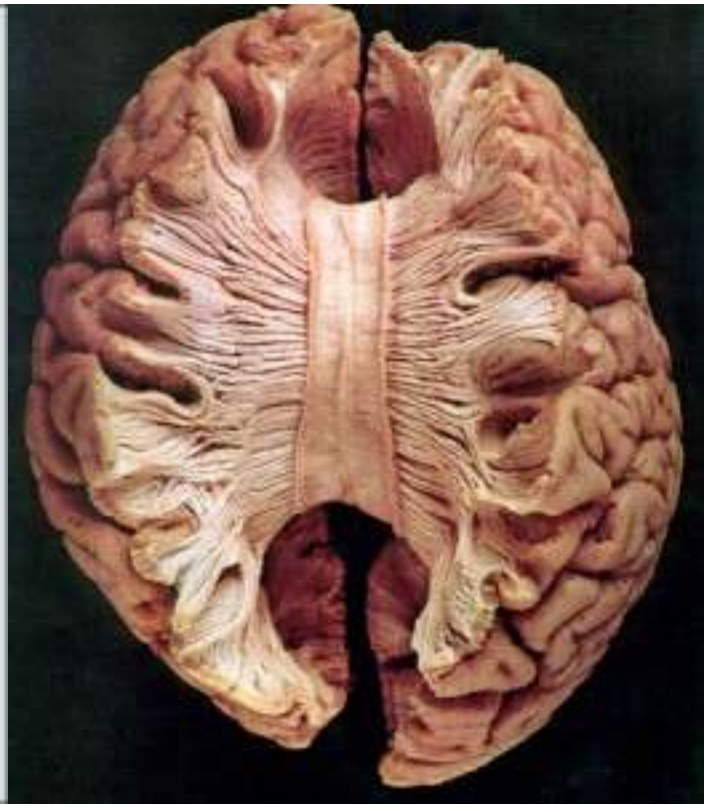
Mapping of chakras to body's endocrine system





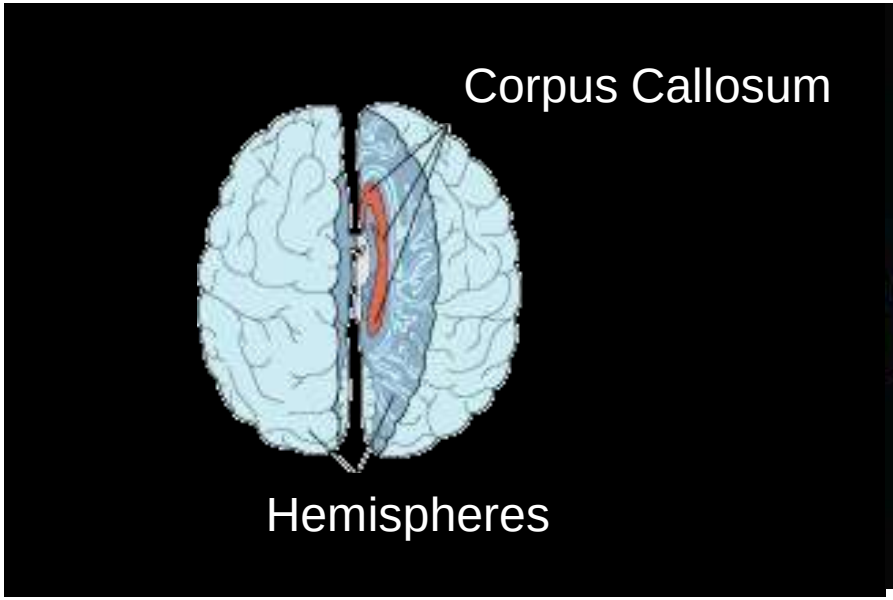
CORPUS CALLOSUM largest tract in the brain

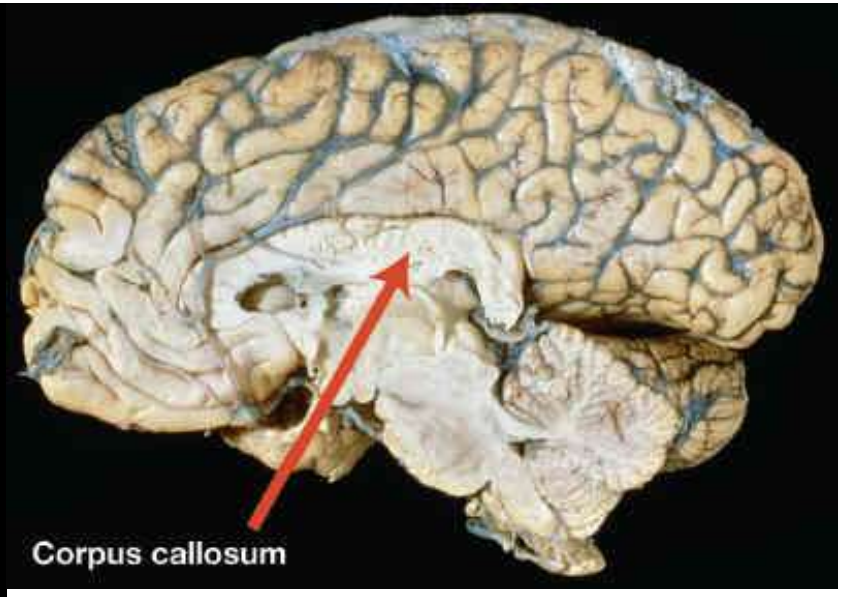




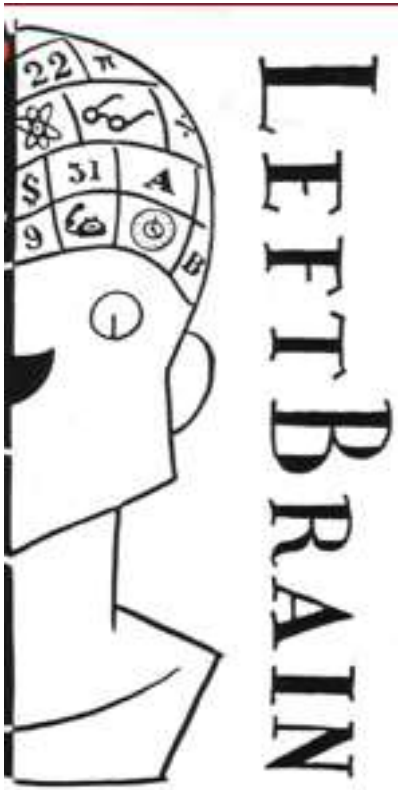
Cerebral Hemispheres

- Cerebral hemispheres - the two sections of the cortex on the left and right sides of the brain.
- Corpus Callosum - thick band of neurons that connects the right and left cerebral hemispheres.





- Left side of the brain: (OBJECTIVE)
  - seems to control language, writing, logical thought, analysis, rational conceptual, mathematical abilities,
  - symbols abstract objective intellect.
  - Coping ability
  - processes information
  - sequentially,
  - serial convergent
  - Planning,
  - problem solving.
  - Verbal,
  - narrative memory



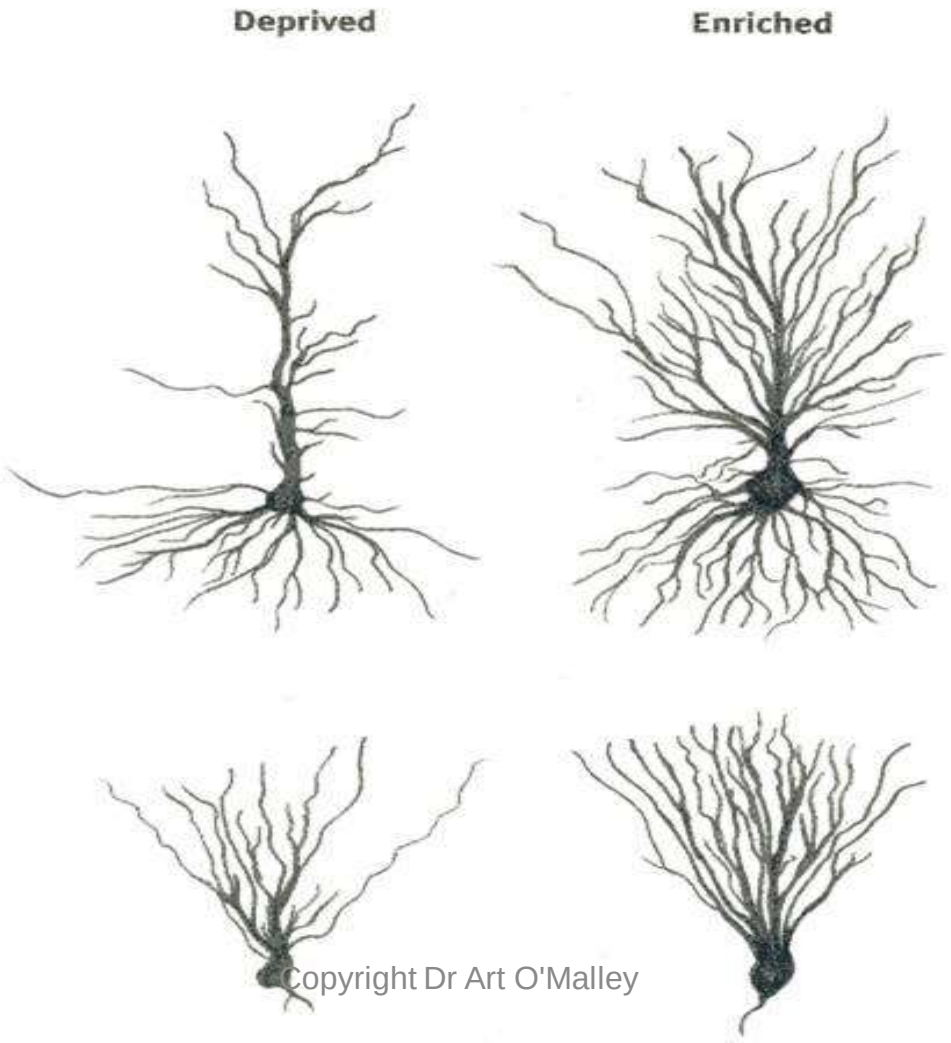
- Right side of the brain (SUBJECTIVE)
  - controls emotional expression,
  - spatial perception,
  - recognition of faces,
  - patterns,
  - melodies, and emotions,
  - processes information globally,
  - visuo-spatial
  - impulsive
  - cannot speak.
  - Nonverbal language metaphor
  - Instinctive survival responses
  - emotional, sensory memory intuition
  - Simultaneous parallel
  - divergent

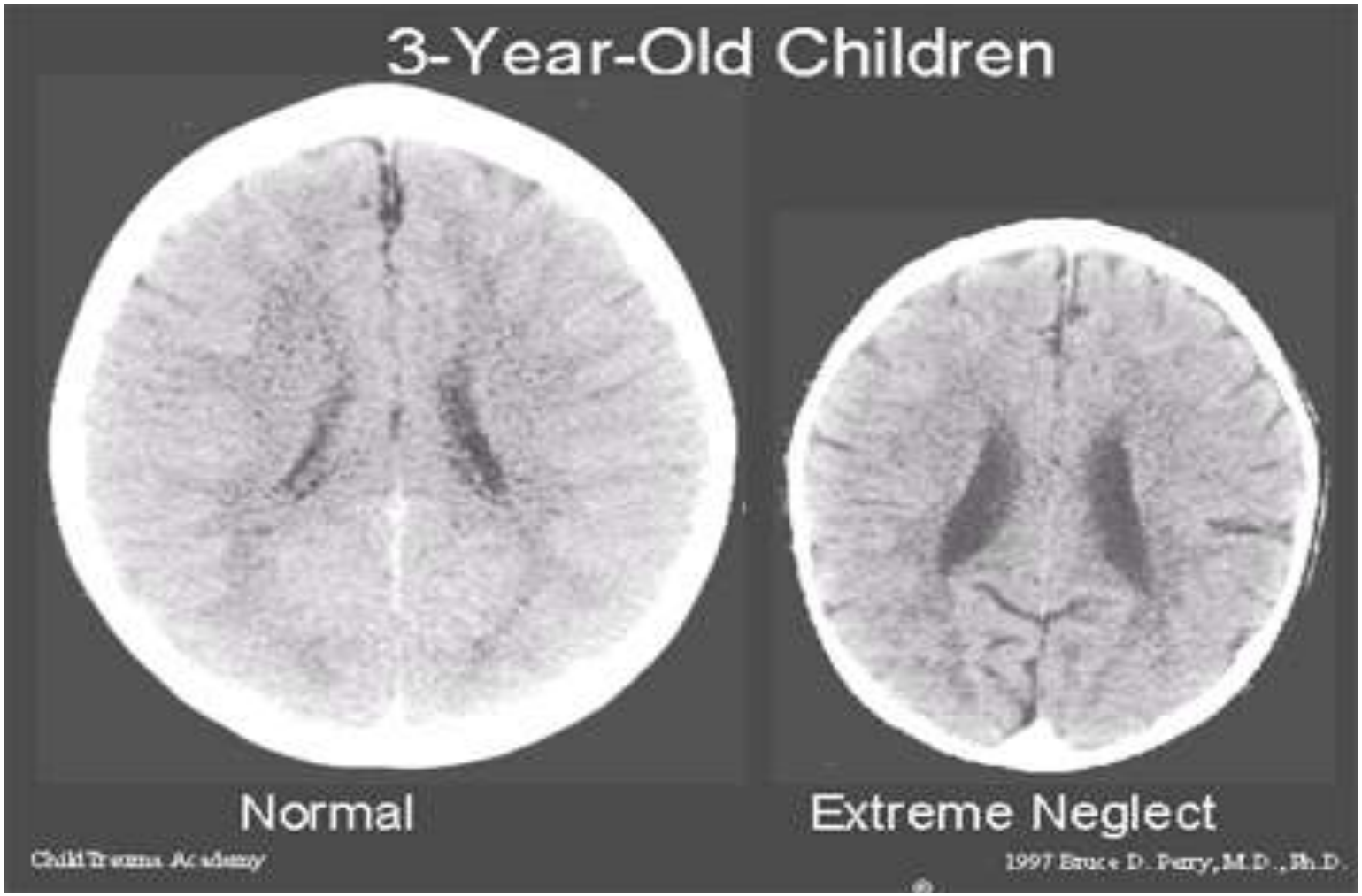
Types of Trauma (Terr)

- I single traumatic experience
  - Hyperarousal intrusive memories
  - flashbacks

- II repeated exposure to extreme stressors
  - Dissociation denial numbing
  - Self hypnosis and rage

Donald Hebb





Cerebellar Volume following trauma

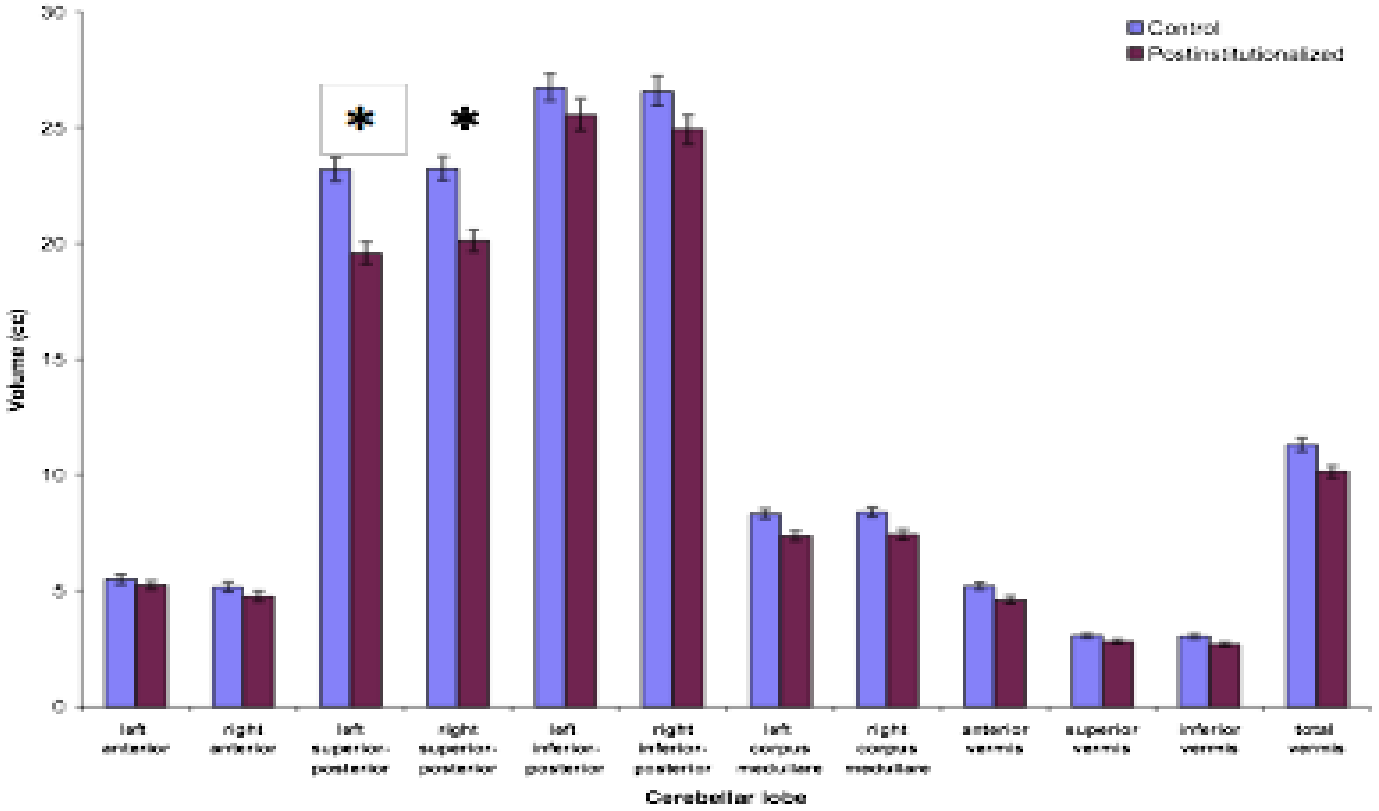


Figure 2. Group comparison of cerebellar regional volumes. * indicates statistically significant differences between the Control and Postinstitutionalized groups.

Early onset trauma

- 5 year old who was referred because of difficulties with adoption
- Outline of treatment
- TFT
- WWW
- BPI
- Systems approach
- BART

Combat related PTSD

- Dissociative subtype more severe
- High scores on Dissociative Experiences Scale (Puttnam)
- Juggernaut driver involved in ‘cheese slicer’ incident where driver of oncoming vehicle killed instantly:
- Failure to respond to 90 sessions CBT
- Initial response to BART psychotherapy

Borderline Personality Disorder

- Often presents with co morbid PTSD or developmental trauma disorder
- Patients' amygdalae deactivated
- Reduced pain sensitivity
- Hence repeated Non Suicidal Self Injury (NSSI)

Dissociative Subtype

- Complex neural network involved
- Top-down memory suppression occurs involving brain structures:
  - Dorsolateral/ventrolateral PfC
  - Anterior cingulate cortex
  - Presupplementary motor area
  - Dorsal premotor cortex
  - Intraparietal sulcus
  - Right putamen
  - Hippocampal inhibition bilaterally

Horowitz & impact of events scale

- State of intrusive feelings and compulsive actions
- State of denial with emotional numbing and constricted ideation
- Thus over or under modulation of affective response to traumatic stress
- Emotional reprocessing is overwhelmed by extreme traumatic input

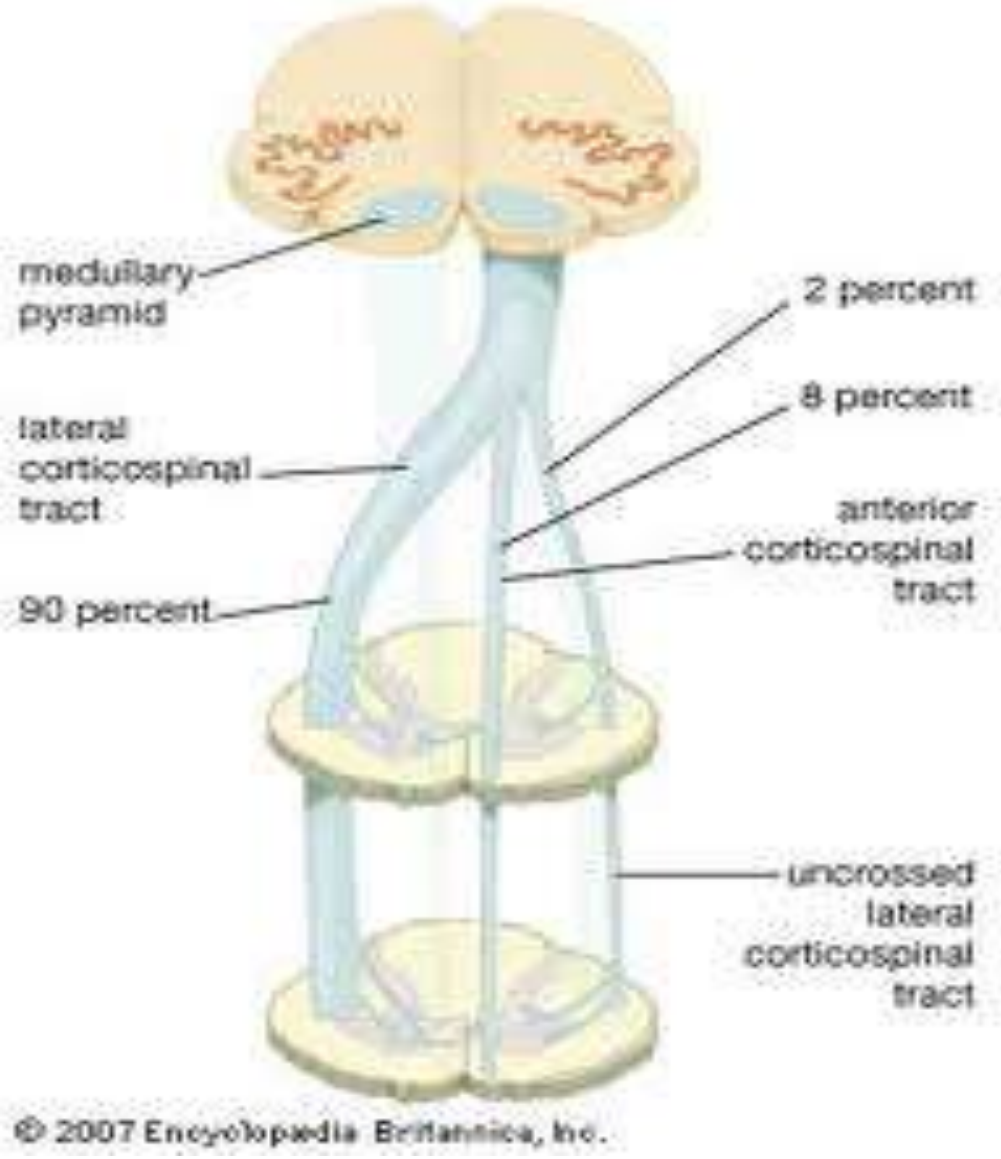
Implications, Treatment & Research

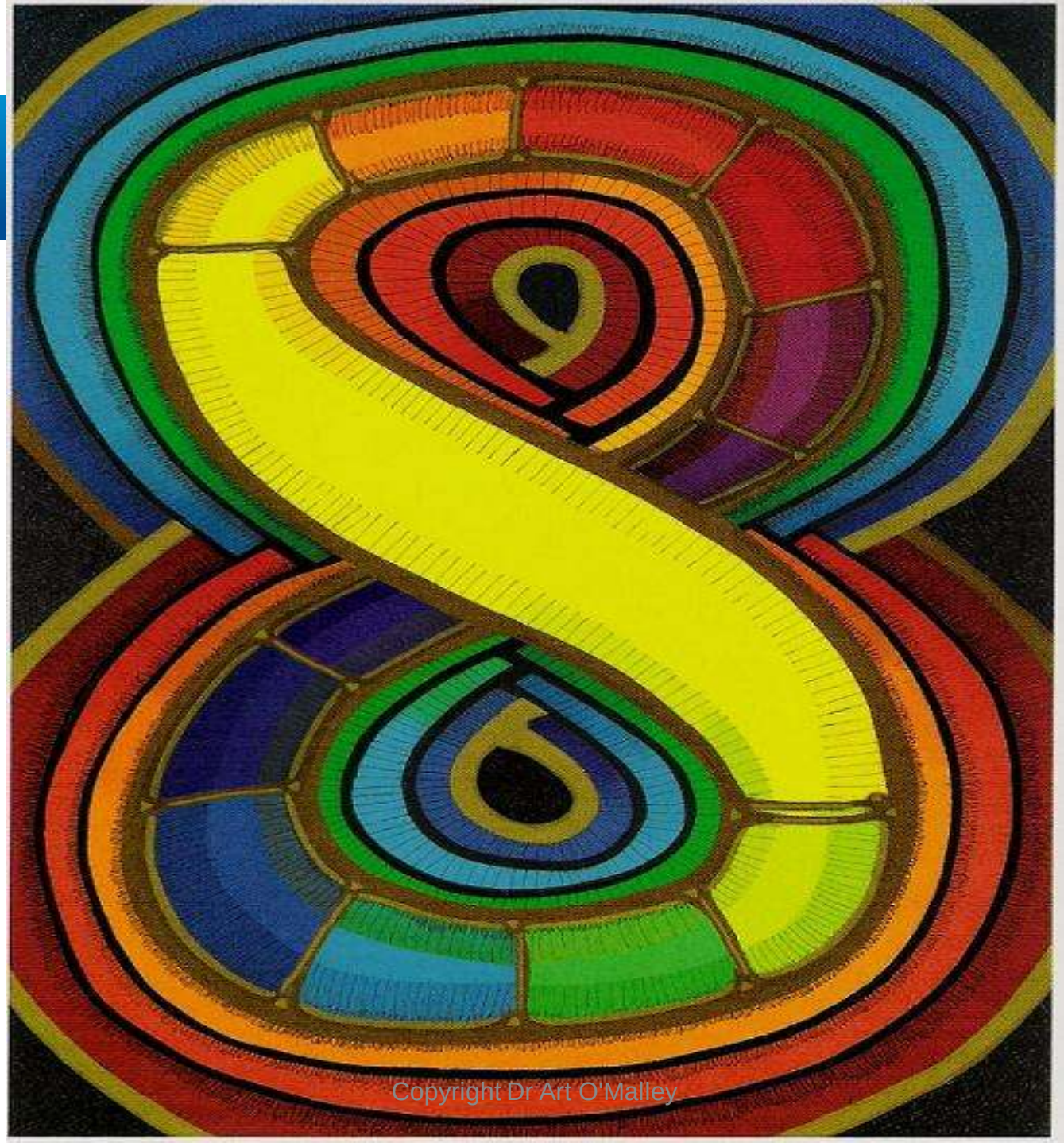
- Imaginal exposure to trauma related stimuli
- Dissociative and numbing symptoms prevent engagement
- Mood regulation and grounding skills
- Modify disordered attachment schemas
- Develop competence in social interactions

Basic Skills

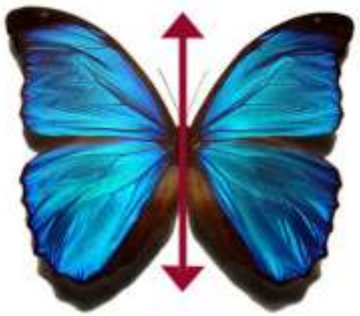
- Relaxation, mindfulness training, coping skills, anger management and grounding
  - Tolerate negative emotion
  - Use social support
  - Calm/soothe self
  - Moderate self-loathing
  - Control destructive impulses (self-harm, violence, substance abuse)
  - Articulate feelings
  - Maintain hope

Bilateral innervations from periphery to brainstem

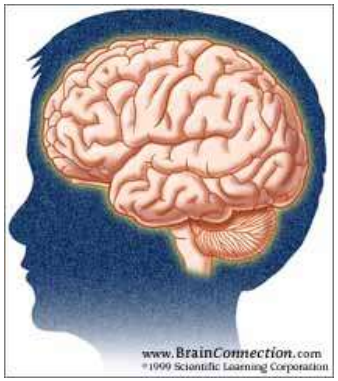




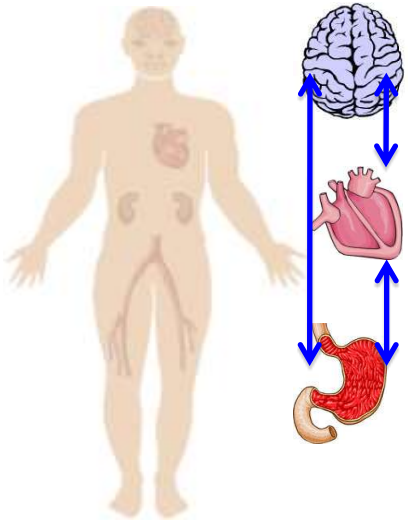
BART S1



BILATERAL



AFFECTIVE



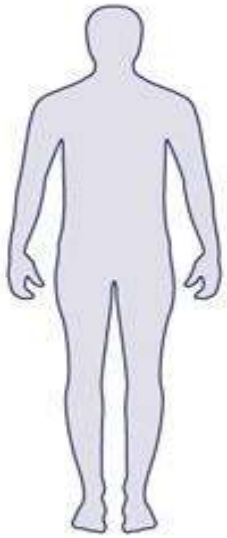
REPROCESSING

TRAUMA

Bilateral affective reprocessing (1)

- Activation of the
- Felt images of the body (primordial body feelings; gut reaction or instinct
- Feelings of emotions
- Engagement of
- Core self, cerebral cortex and consciousness leading to
- Transformation and
- Integration of somatic maps (brainstem & cerebellum) of
- Visceral
- Experience

BART S2



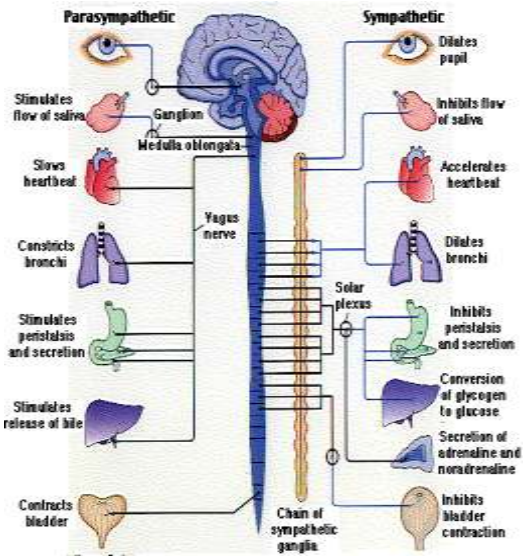
BODY'S ACCELERATED RECOGNITION *of* THOUGHTS

A Better View

Bilateral affective reprocessing (2)

- Autonomic arousal in the aftermath of trauma
- Focus on
- Feelings
- Emotions which are
- Contained &
- Transformed via
- Imagination and
- Viewed repeatedly until
- Experienced as factual

BART S3

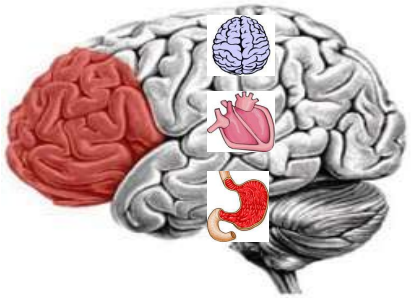


BRAIN'S A.N.S *is* RESILIENT *and* TOGETHER

Bilateral affective reprocessing (3)

- Arousal without chaos or rigidity (within window of tolerance)
- Fine tune senses for effective
- Feedback
- Efficacy of self
- Connecting cerebellum
- Transfer
- Interpret
- Verbalized
- Experiences

BART S4



BRAIN'S AXONS REWIRED *for* TRANSMISSION

Bilateral affective recovery (4)

- Activation (within window of tolerance)
- Frequency optimized
- For
- Efficient
- Conscious
- Transmission
- Increased
- Vibratory
- Experiences

BART S5 Trauma therapy

BETTER

ACTIVE

RECOVERED

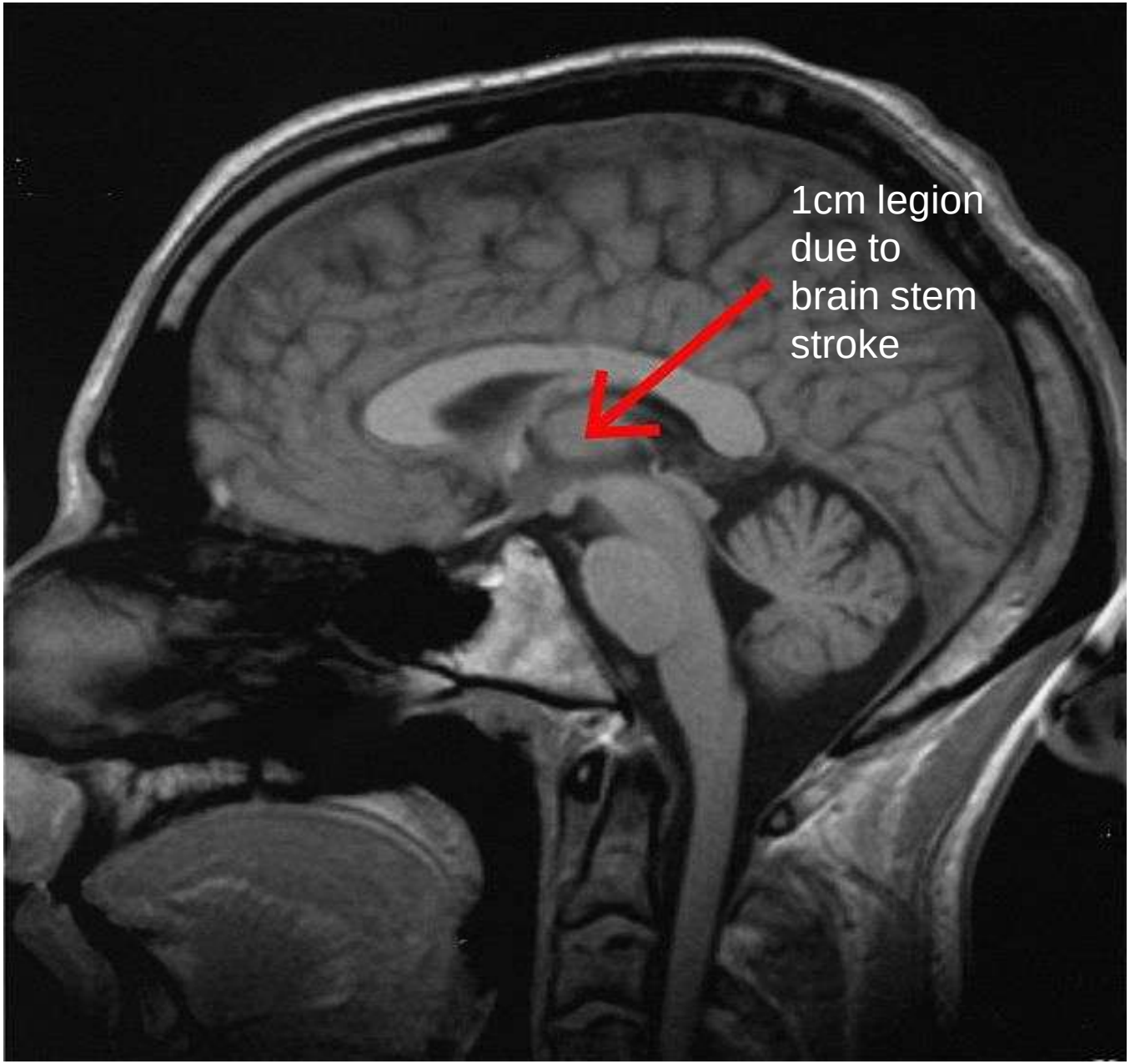
TRIUMPHANT

BART Trauma therapy (1-5)

- Better integration of top down and bottom up processing
- Active most trauma stored initially at gut level
- Recovered knowledge like our home i.e. built from our earliest experiences through childhood, adolescence and into adulthood
- Triumph of integration, Proto, core and autobiographical self become one (Damasio)

CASE HISTORY

- boy aged 6, collapsed in school (Nov. 2008)
- diagnosed with a stroke with 1cm lesion in brain on fMRI (low attenuation in region of left thalamus/ internal capsule)
- admission to hospital – personality change
- 10 sessions CBT but symptoms persisted
- Following 2 BART sessions made full recovery
- related to repeated attempts to get blood and pain from right-sided weakness



12 year old boy

- Impulsive and hyperactive
- School expulsion shooting BB gun at teacher
- Unaware of danger
- Aggressive, angry
- Cruelty to animals
- Disclosed sexual abuse to schoolmates
- Upset and punching walls
- Referral made to Rape & Sexual Abuse Centre refused to accept him as too young

Developmental history

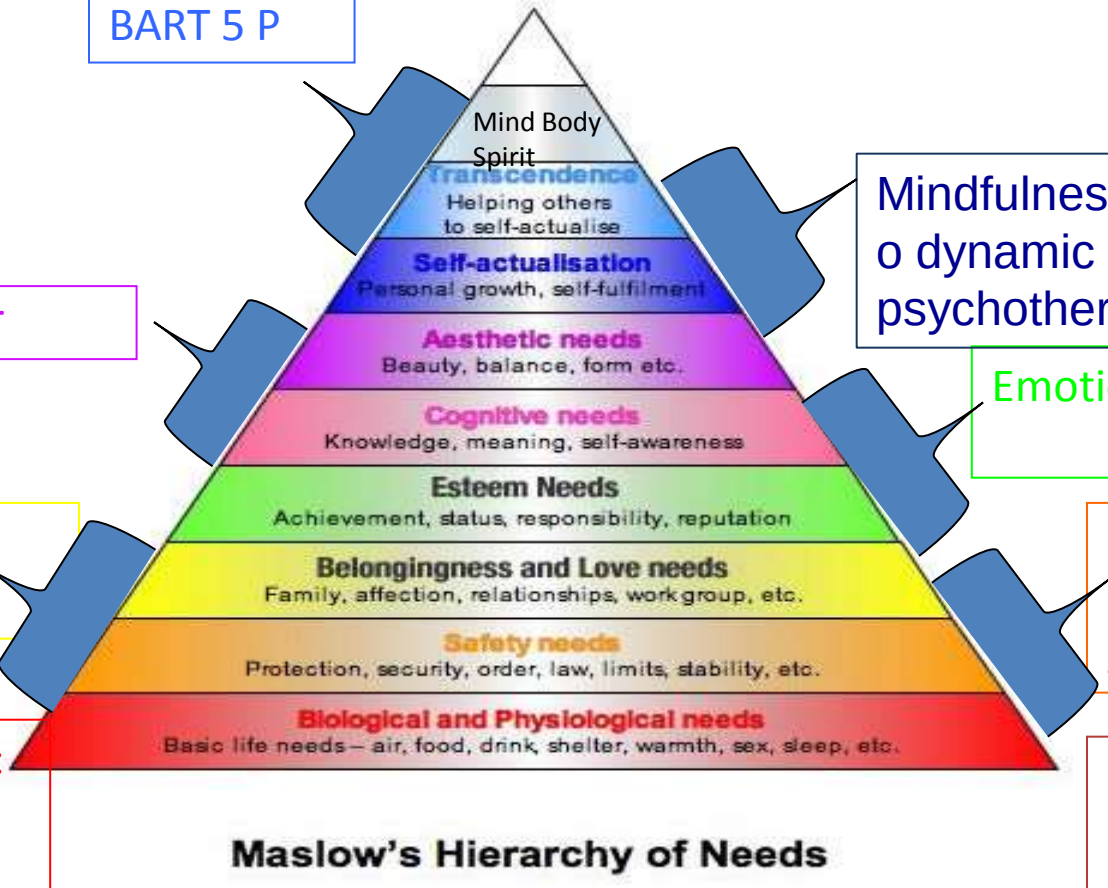
- Born at 28 weeks gestation
- Put on apnoea monitor because of cot death risk until the age of 2
- Mother developed cervical cancer and post operative adhesions
- Subsequently experienced domestic violence witnessed by son who rang the ambulance

BART sessions

- Mother processed her emotions in relation to son's birth and own diagnosis of cancer Anger at refusal of surgeons to reoperate
- Session 2 Son processed anger, shame, scared feelings and fear when threatened with knife and sexually abused
- Feelings reprocessed from heart to throat to finally feeling, 'good all over'
- Session 3 completed on 10/10/11
- Patient felt, "better and amazing"

BART S1 – S5

BART 5 P



Maslow's Hierarchy of Needs

Mindfulness/psych o dynamic psychotherapy

Cognitions/ CBT

Emotions /EMDR

Self Regulation/ Arousal

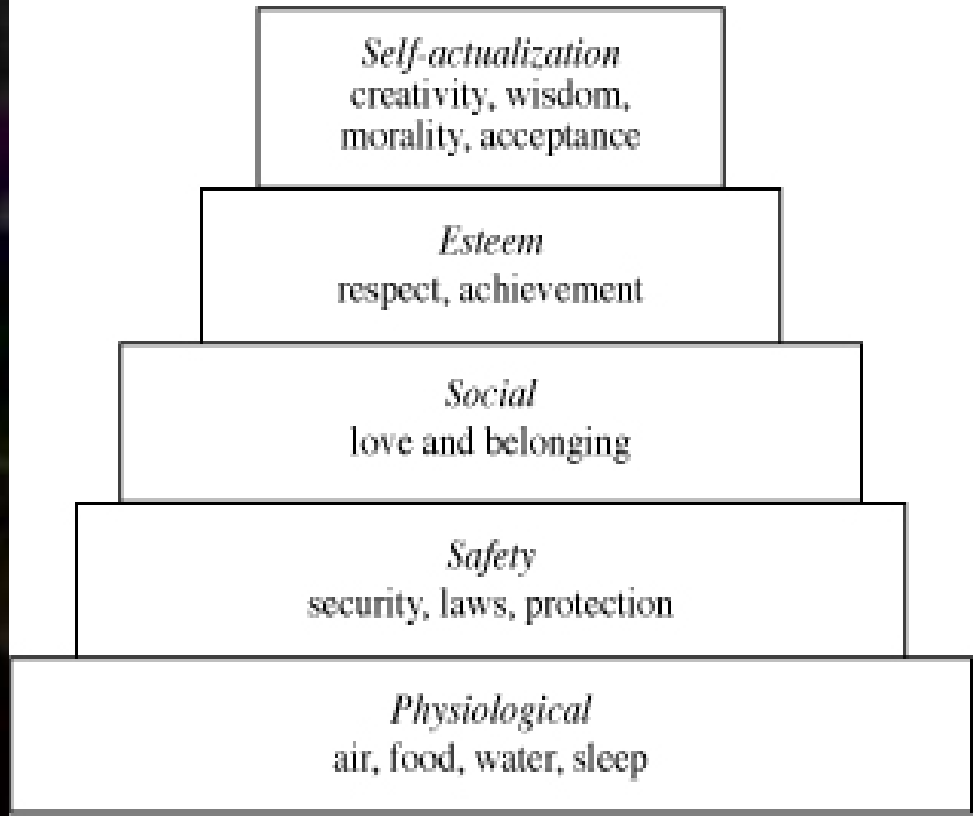
Sensory Motor Approach

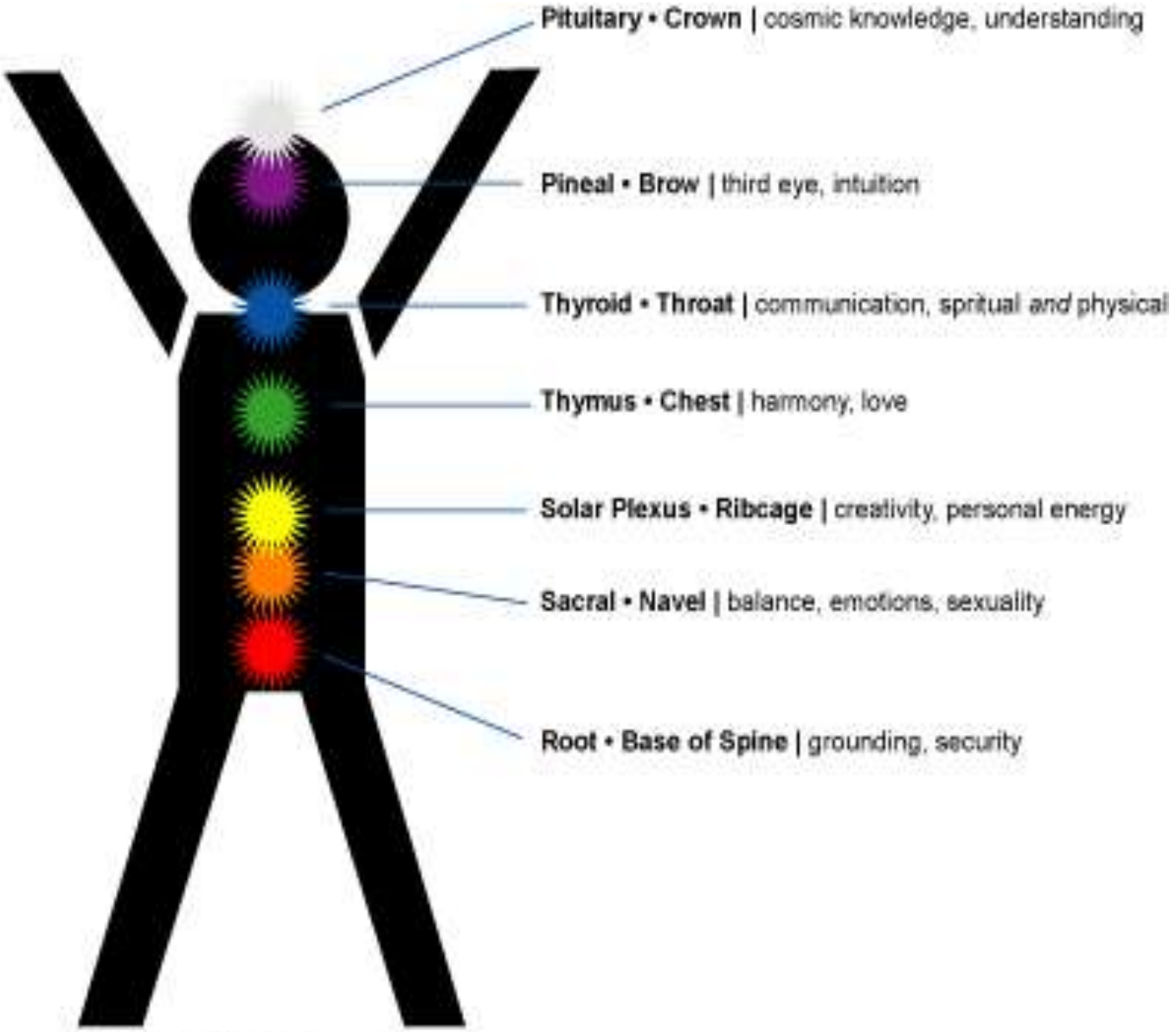
Internal/ Somatic States embodied

Grounding/ Breathing safe state 5 elements

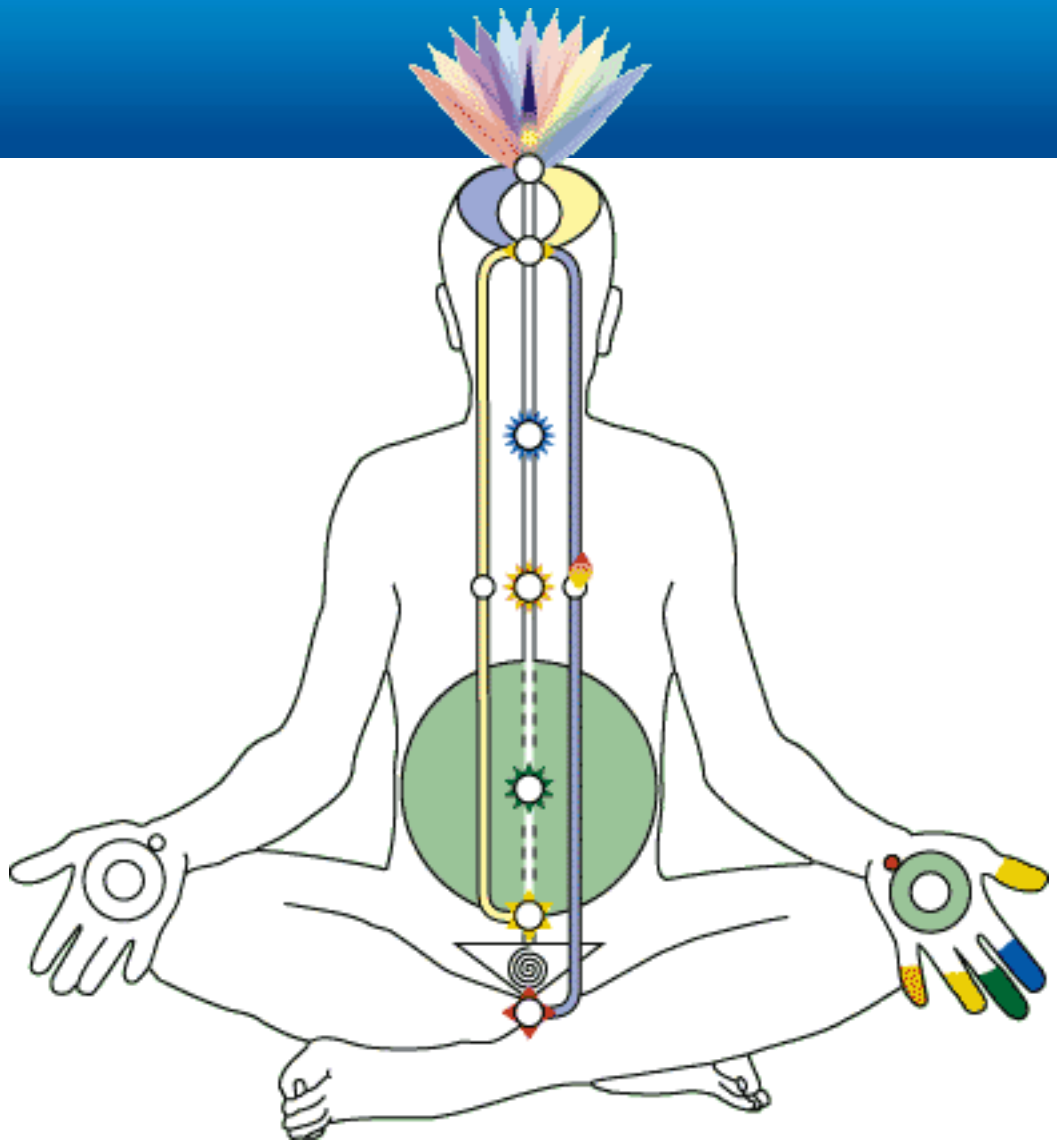
A Better View

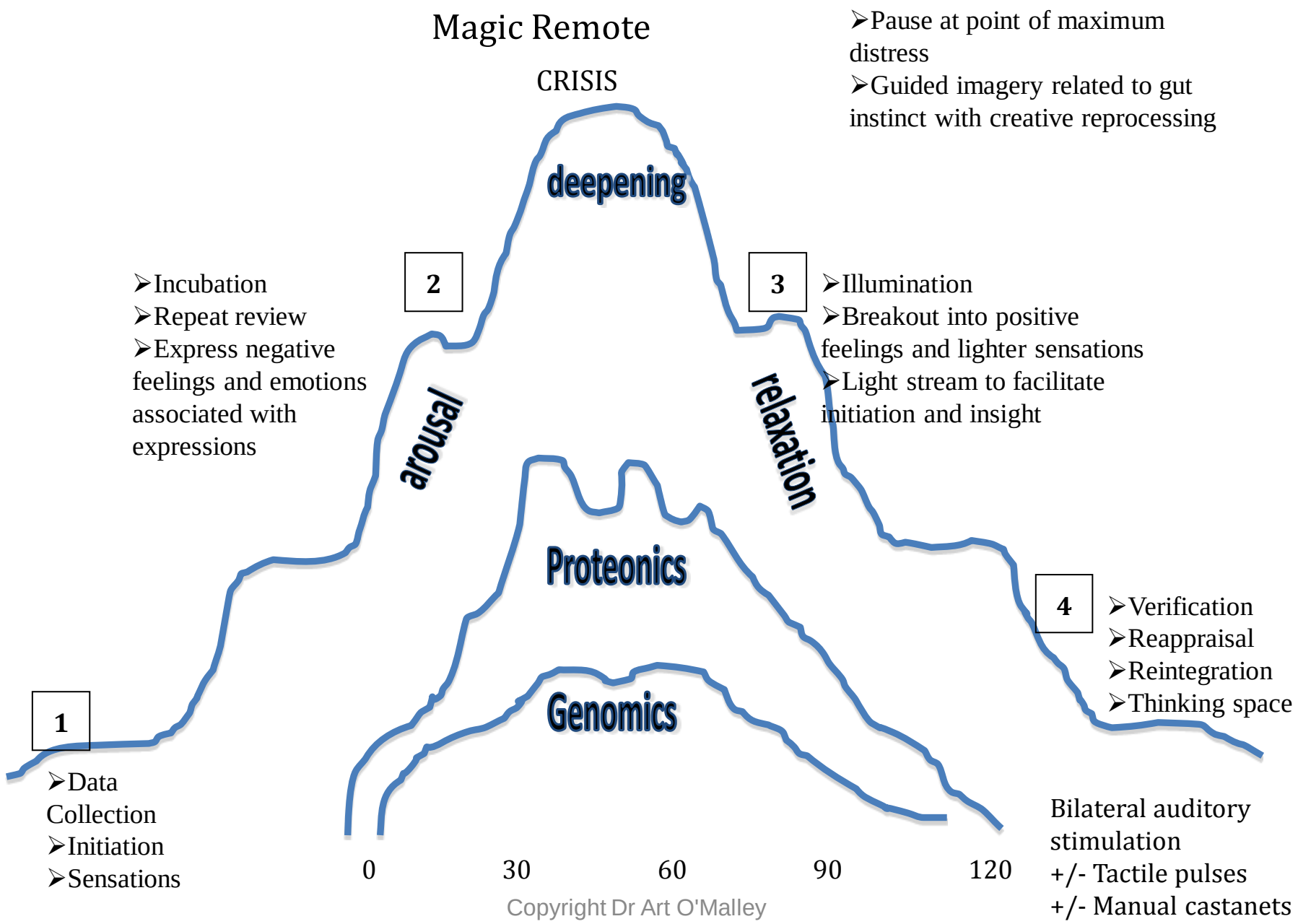
CHAKRAS: MASLOW'S HIERARCH





A diagram representing Chakras.





Conclusions

- Distinguish types of PTSD symptoms
- Effect of trauma on key brain structures:
- PFC, insular cortex thalamus, superior Colliculus
- Periaqueductal grey brainstem, heart and gut
- Window of affective tolerance and emotional regulation (WATER) in relation to frozen & rapids
- Increased activation PFC means inhibition of limbic system blood flow
- Overmodulation of emotions leading to complex dissociative symptoms

Conclusions (continued)

- Introduced to a new model of therapy conceptualized as a neurobiological trauma therapy or BART S1 – S5
- Trauma focused therapy is a generic term
- BART'5 trauma therapy is the specific protocol that I have developed to allow therapists to safely contain and treat the most severe and complex acute and chronic trauma
- Developmental trauma disorder DSM V, ICD 11
- Trauma spectrum disorder TSD latest concept

Current and Future Research

- Use of impact of events scale (IES) acute and chronic versions to select patients with similar symptom patterns
- Validate the newer treatment options
- Skills training in affect and interpersonal regulation reported (STAIR Cloitre et al 2010)
- Bilateral affective reprocessing, resilience & recovery therapy BART Trauma therapy
- Research the optimum frequency of bilateral activation for information processing

B OK A1.0

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- Thank you
- Any Questions