

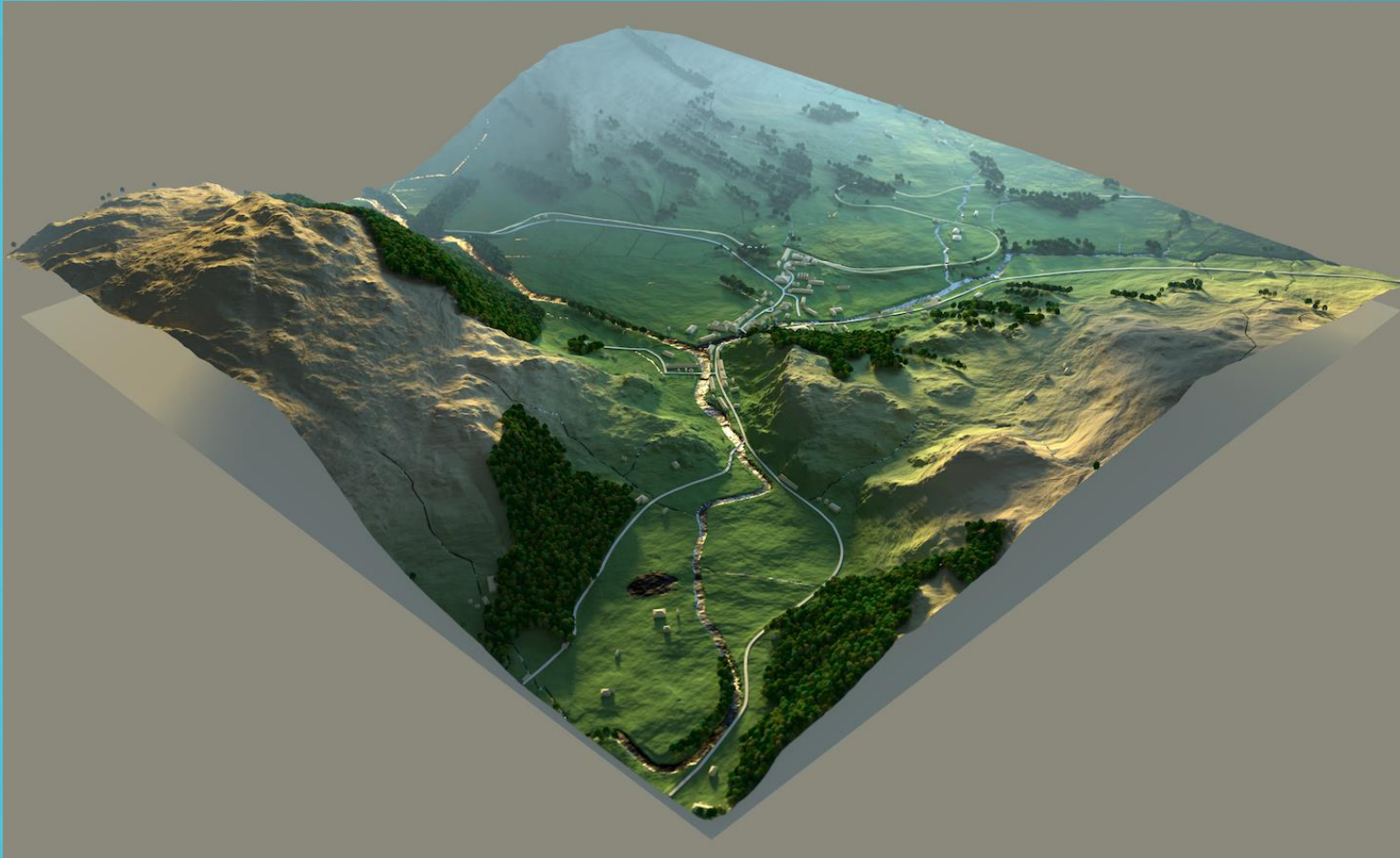
# **A Neuroplasticity "Brain Retraining" Approach to Treating Chronic Illnesses**

**Ashok Gupta MA(Cantab), MSc**





# The Map is Not The Territory - NLP





A microscopic image showing several neurons with prominent cell bodies and long, branching dendrites and axons, set against a dark blue background. The neurons are stained in a light blue/cyan color, making them stand out. One neuron in the upper right is particularly large and detailed, showing a dense network of branching processes. Other neurons are visible in the background, some in focus and others blurred.

100,000,000,000 Neurones in the brain!





How does our modern way of living increase inflammatory bias?



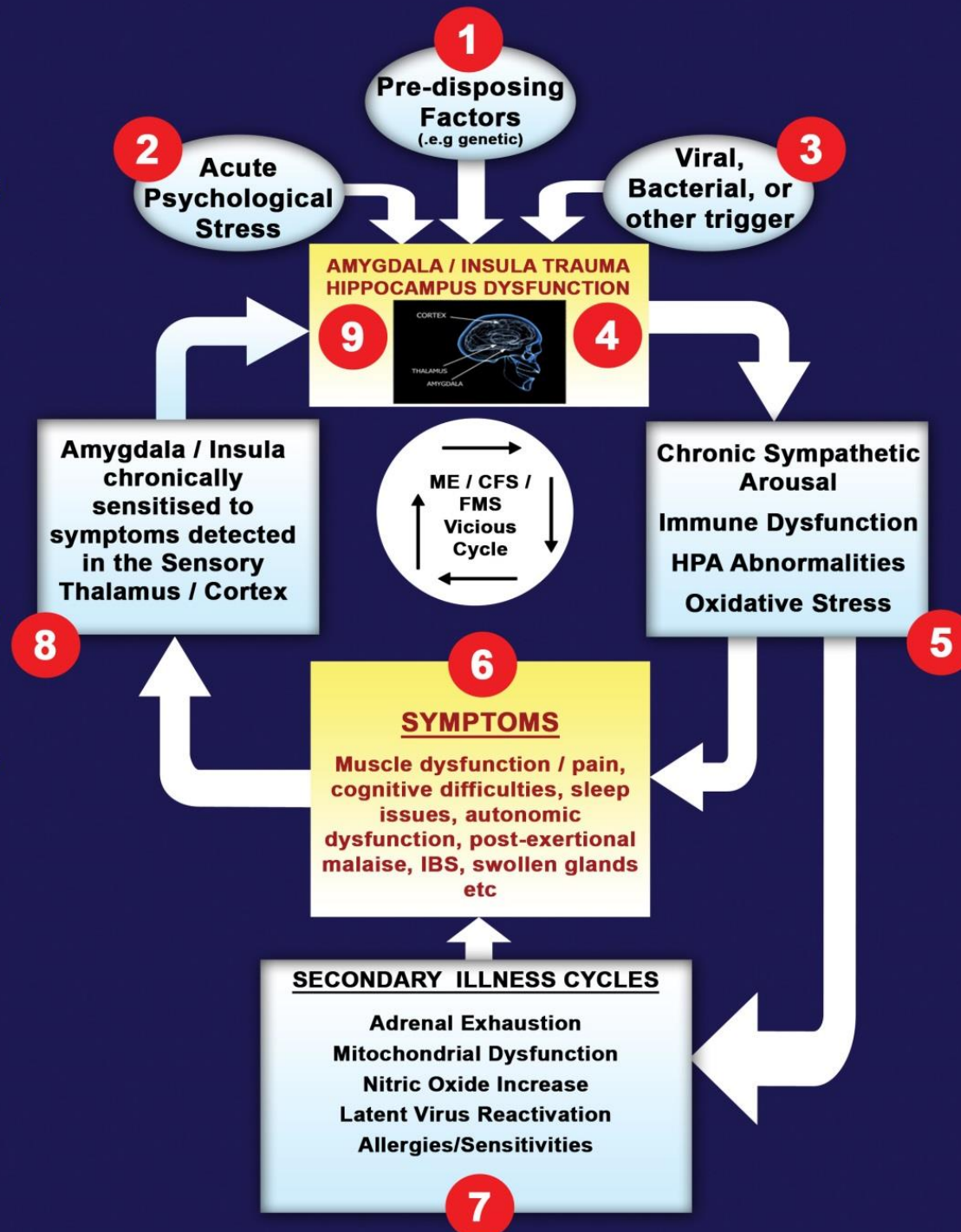
Diet? Sleep? Mind? Pollution/Chemicals?

## Precipitating Factors



**Precipitating Factors**

**Perpetuating Factors**

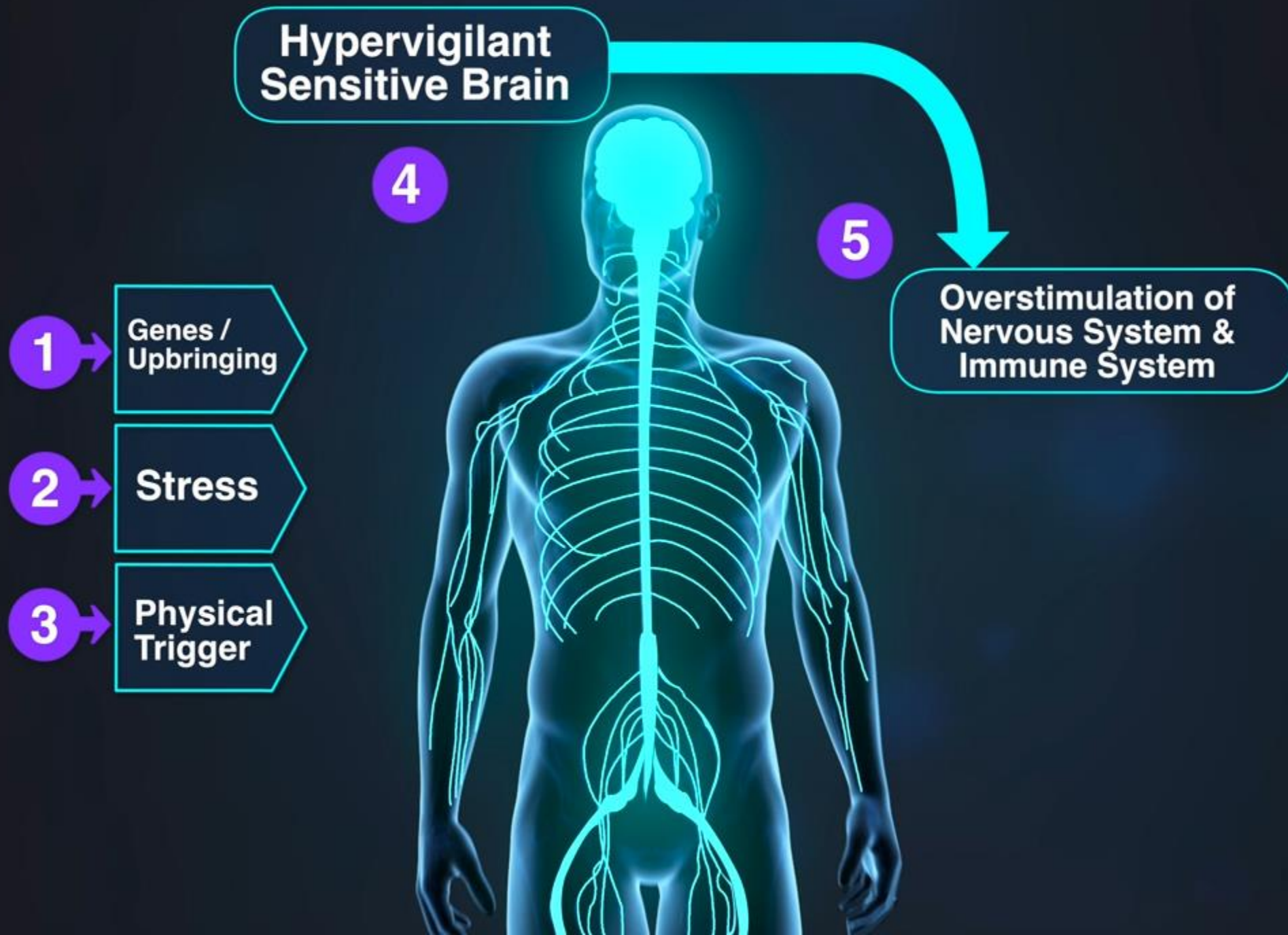


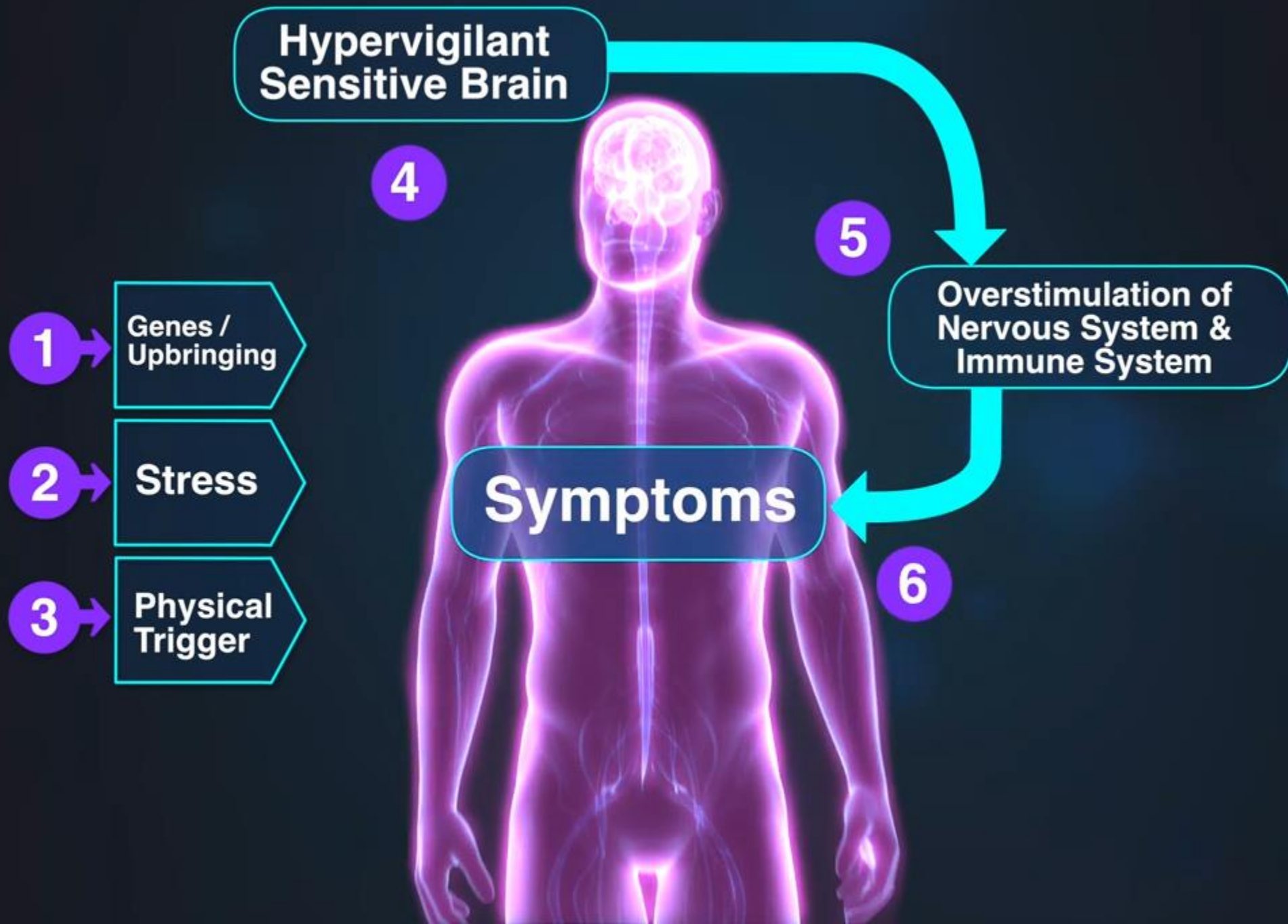


## Hypervigilant Sensitive Brain

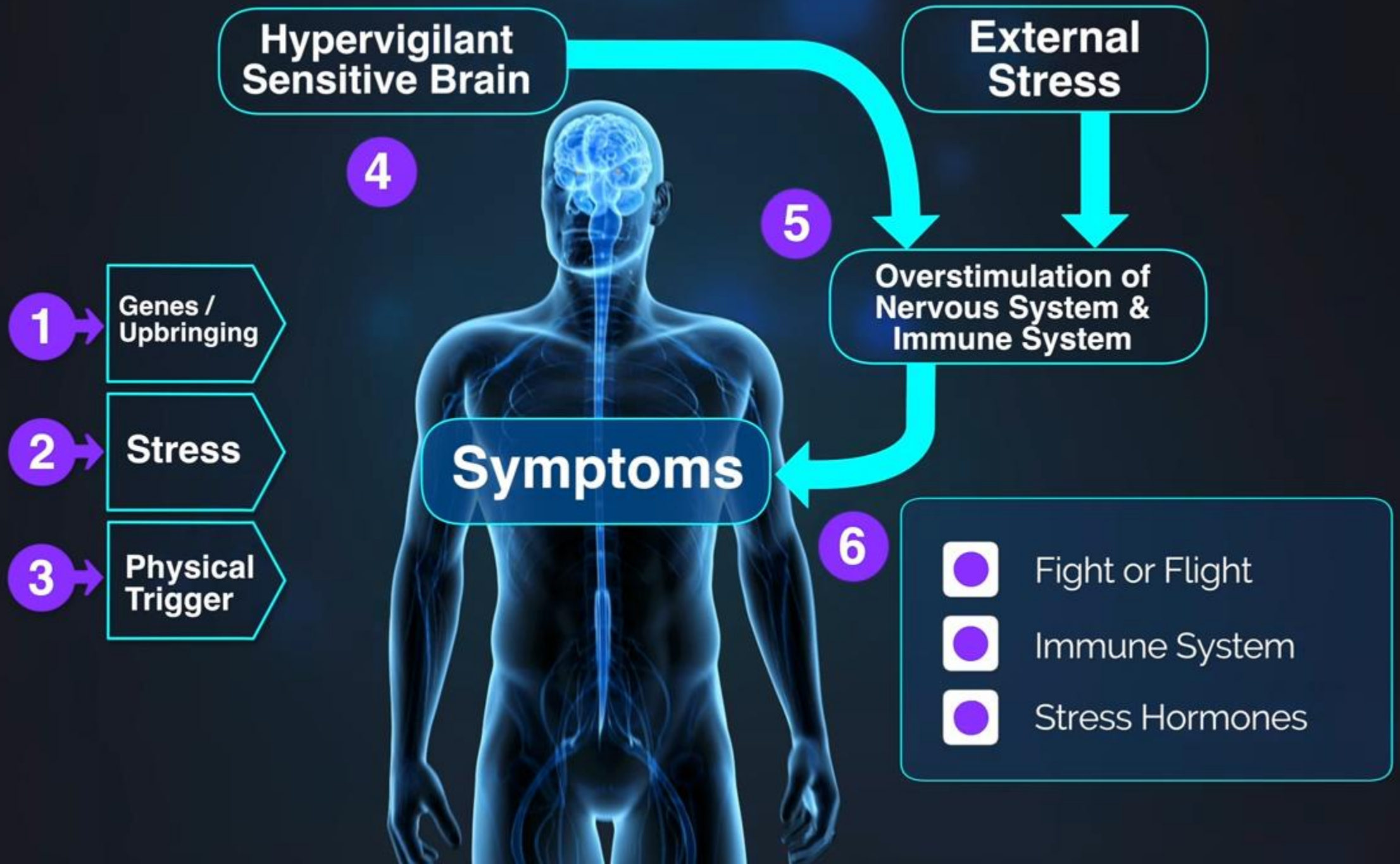


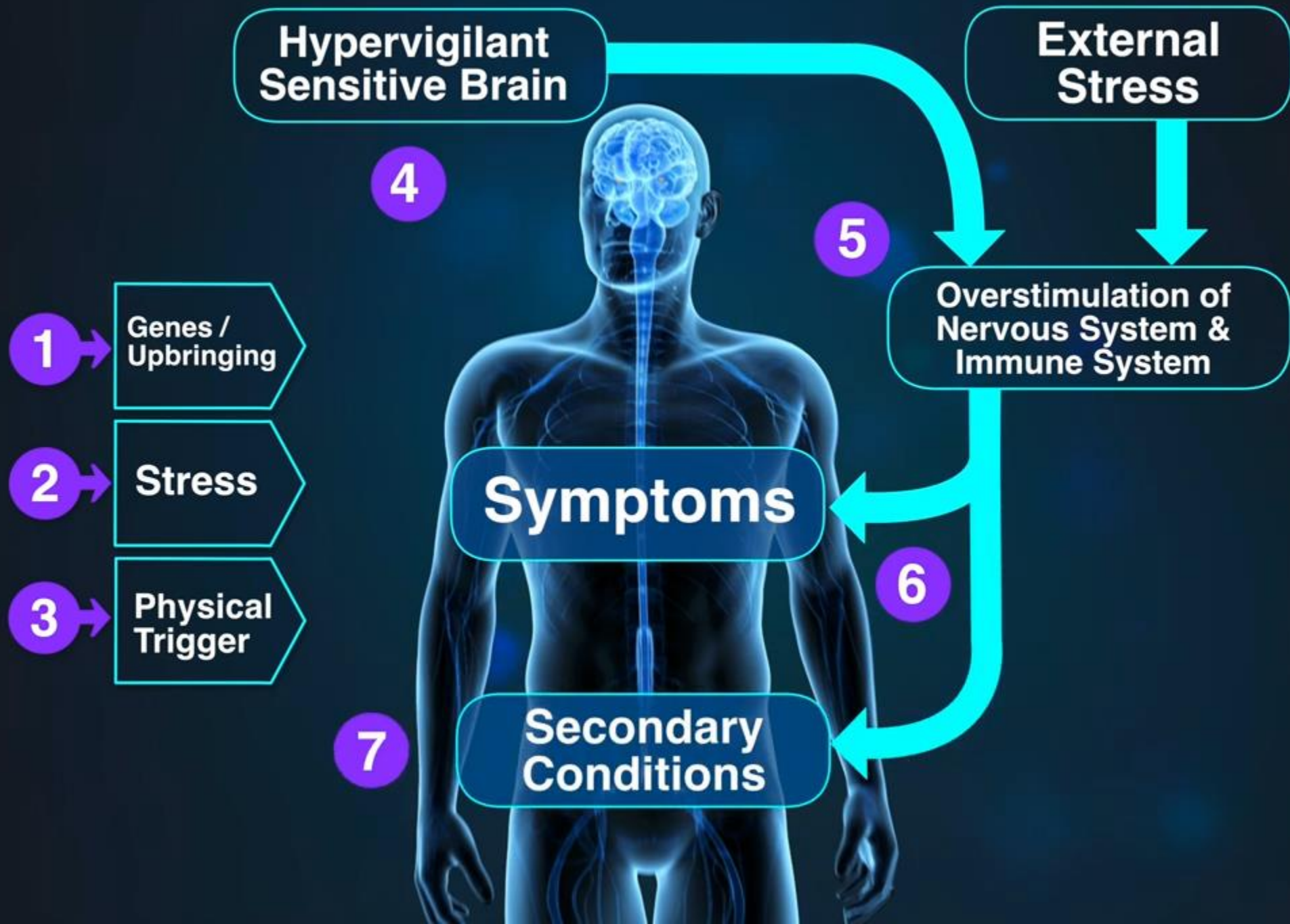




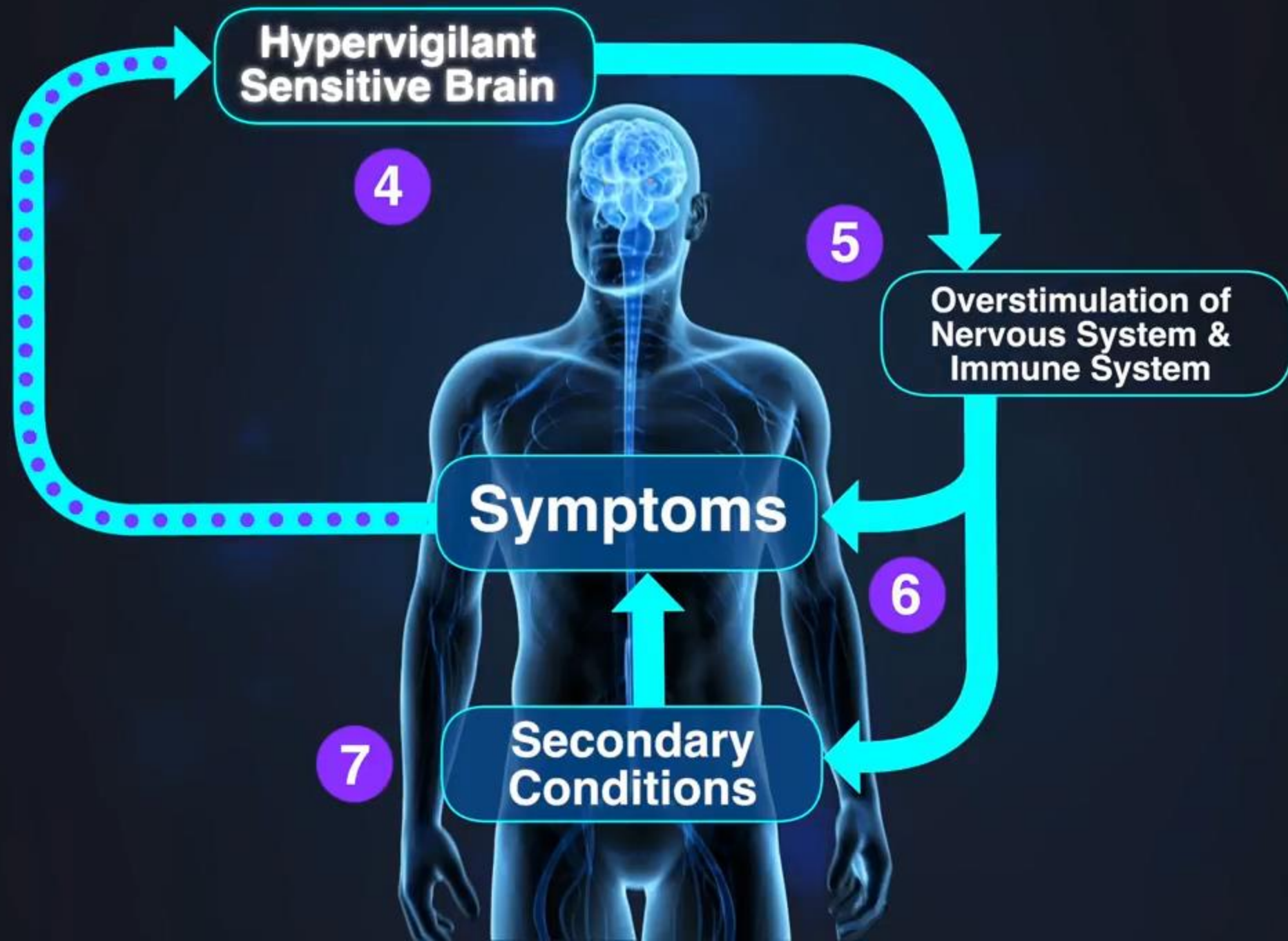




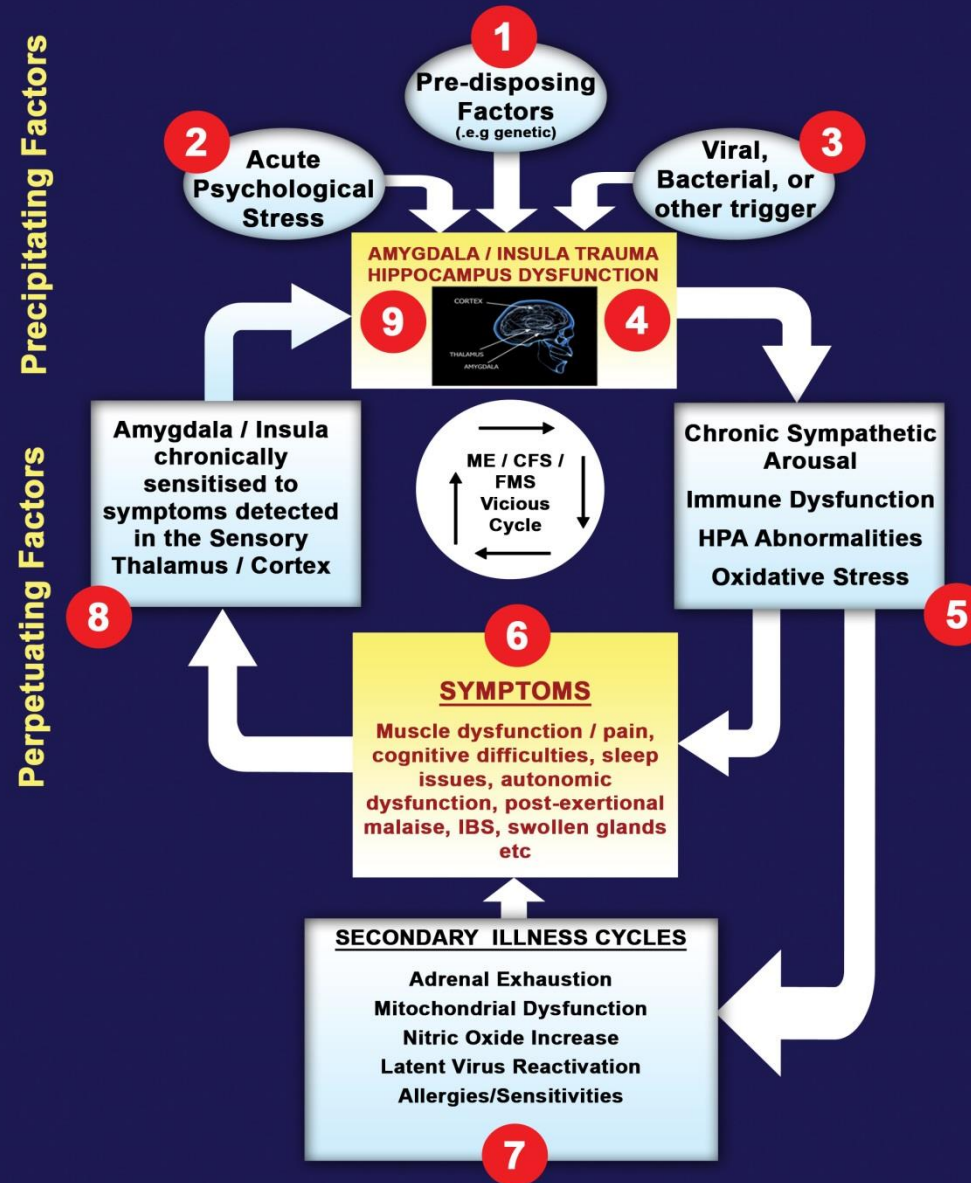






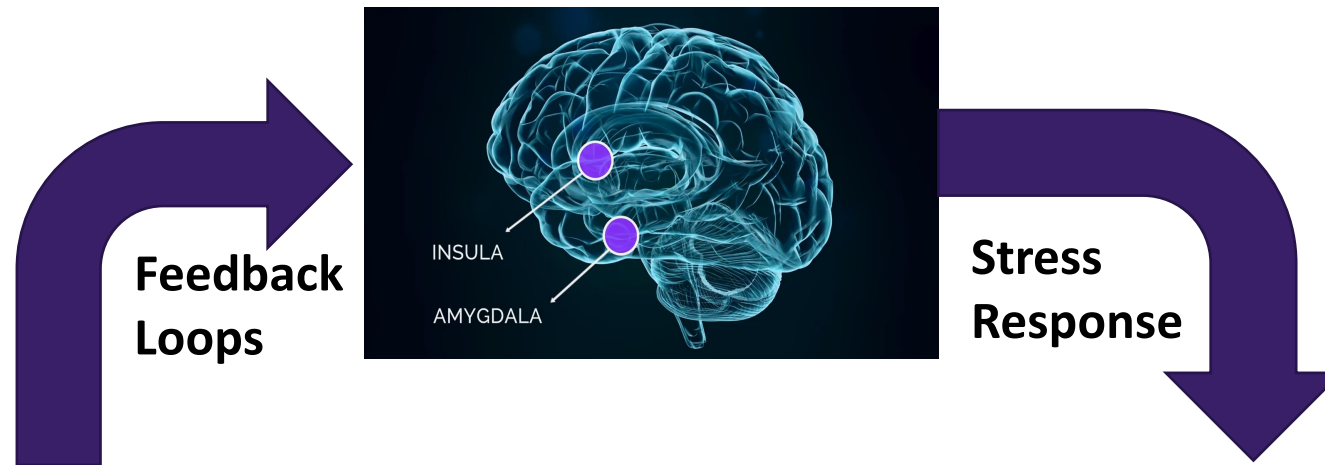


## AMYGDALA / INSULA HYPOTHESIS FOR ME/CFS





# Brain/Gut Interaction after Sympathetic Hyperarousal



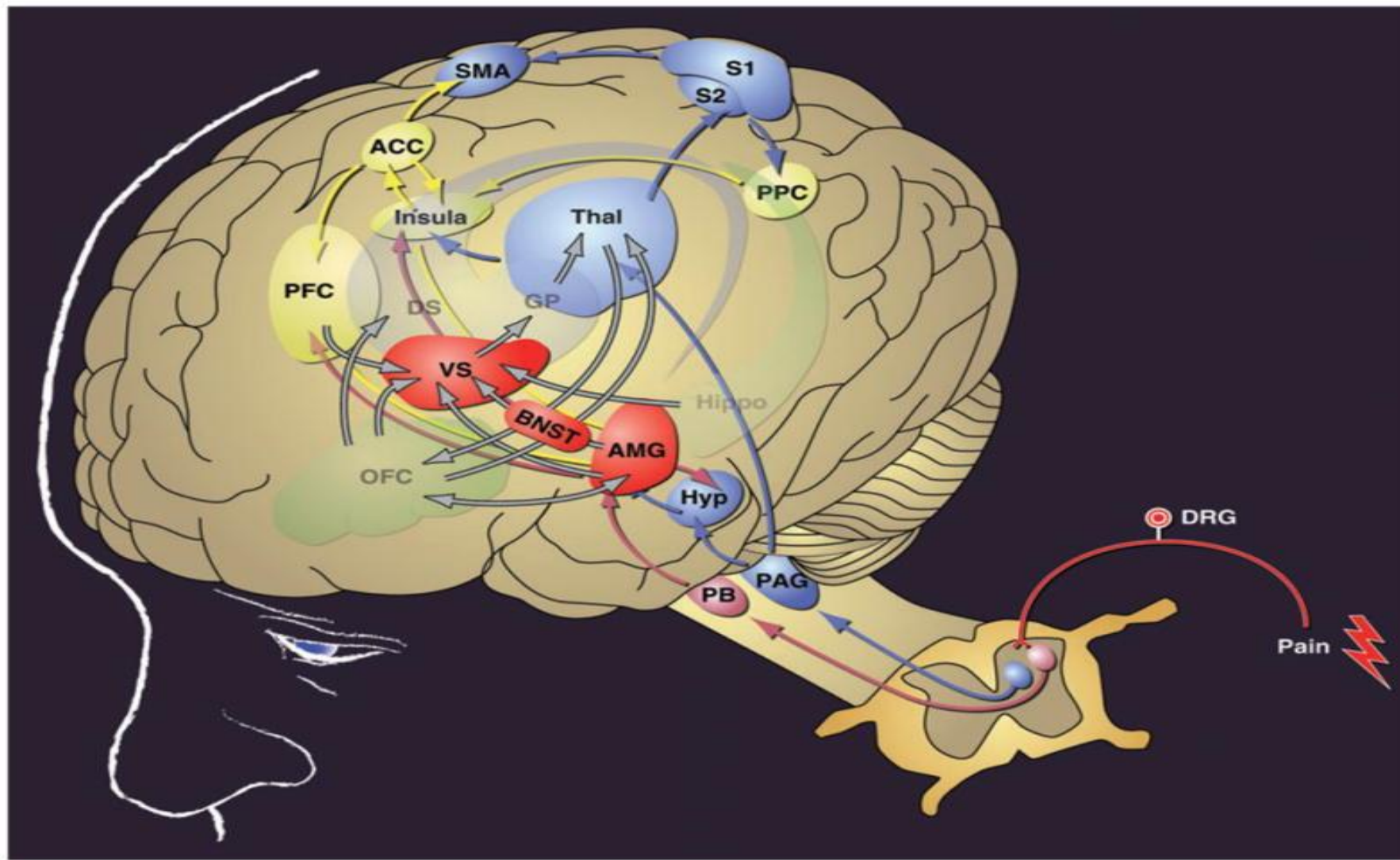
## CAUSES OF GUT CHALLENGES

1. HPA Axis triggering Cortisol, directly weakening immune system
2. Cortisol can weaken gut lining causing “leaky gut”
3. Stress reduces secretions such as bile, enzymes and stomach acid
4. Direct affect on gut bacteria and effects of “biofilm”
5. Impairment of gut motility, causing food to stagnate
6. Cortisol, Adrenaline and Noradrenaline causing Tightening of gut
7. Fluctuating sugar levels
8. Detoxification systems shutting down

# Chronic Illness Observations

- Brain inflammation and swelling, as well as atrophy
- Brain generalizes the stimuli that indicate presence of the danger
- Detoxification systems shut down during severe sympathetic responses
- Peripheral Sensitisation vs Centralised Sensitisation
- Local and global inflammation



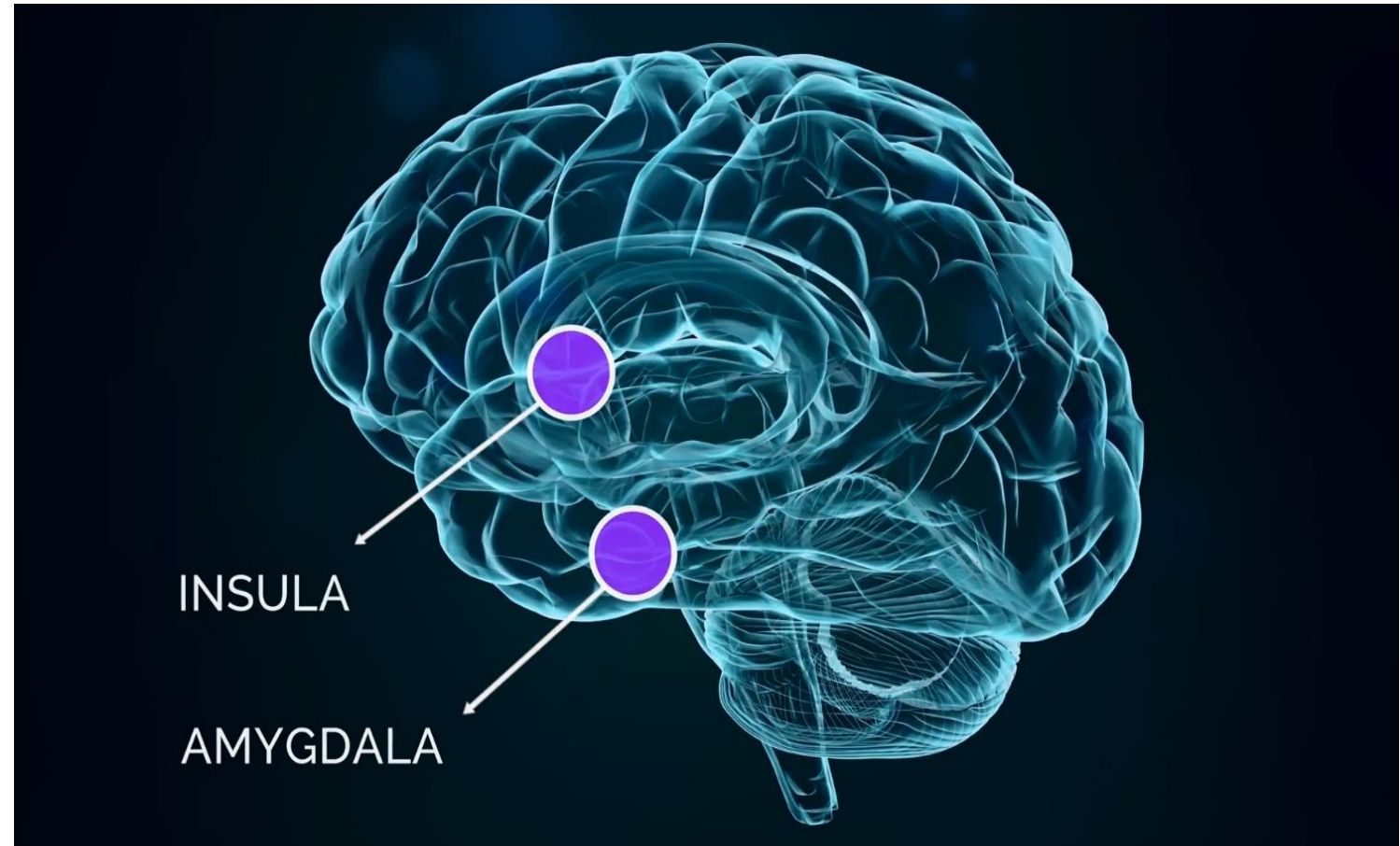


ACC = anterior cingulate cortex; AMG = amygdala; BNST = bed nucleus of the stria terminalis; DRG = dorsal root ganglion; DS = dorsal striatum; GP = globus pallidus; Hippo = hippocampus; Hyp = hypothalamus; Insula = insular cortex; OFC = orbitofrontal cortex; PAG = periaqueductal grey; PB = parabrachial nucleus; PFC = prefrontal cortex; PPC = posterior parietal cortex; S1, S2 = somatosensory cortex; SMA = supplementary motor area; Thal = thalamus; VS = ventral striatum

# The Amygdala & Insula

The Amygdala & the Insula system do not differentiate between threats:

- Emotional
- Physical
- Chemical
- Biological





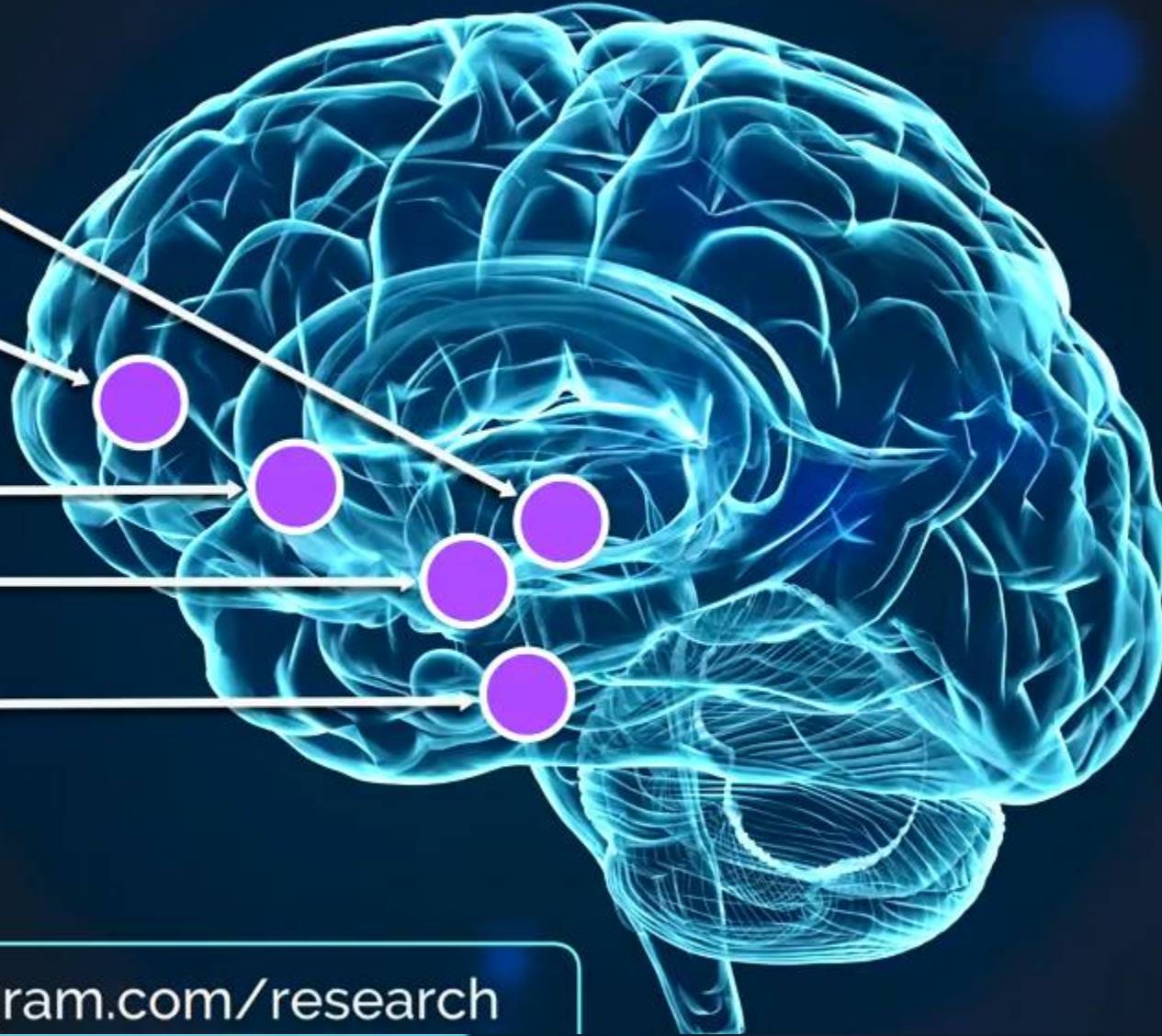
THALAMUS

PREFRONTAL CORTEX

ANTERIOR CINGULATE

HYPOTHALAMUS

HIPPOCAMPUS

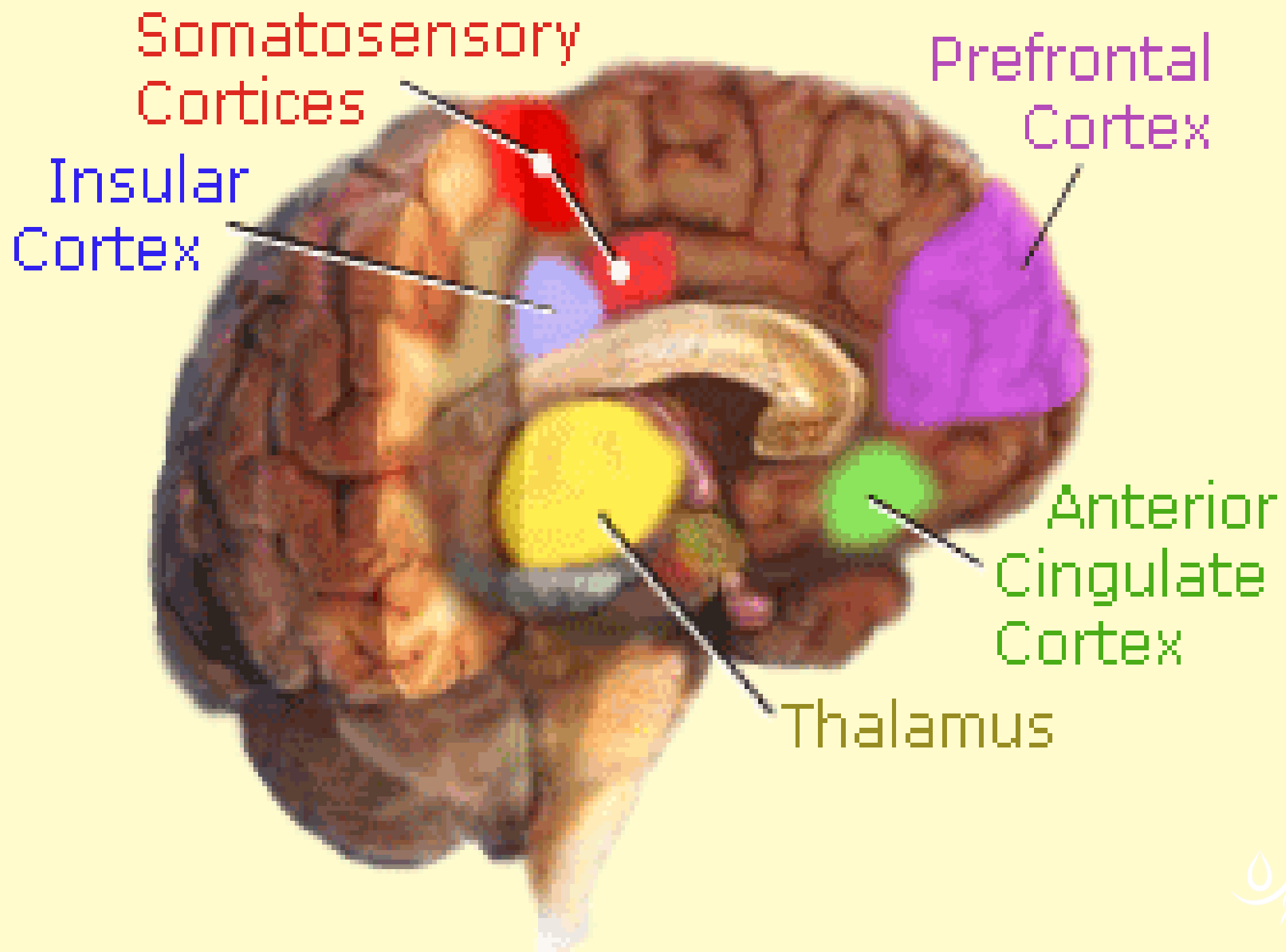


[www.guptaprogram.com/research](http://www.guptaprogram.com/research)

# Brain regions involved in Chronic Illnesses?

- Amygdala
- Insula
- Anterior Cingulate
- Hippocampus
- Thalamus
- Pre-frontal cortex
- Somatosensory cortex





# Role of Insula

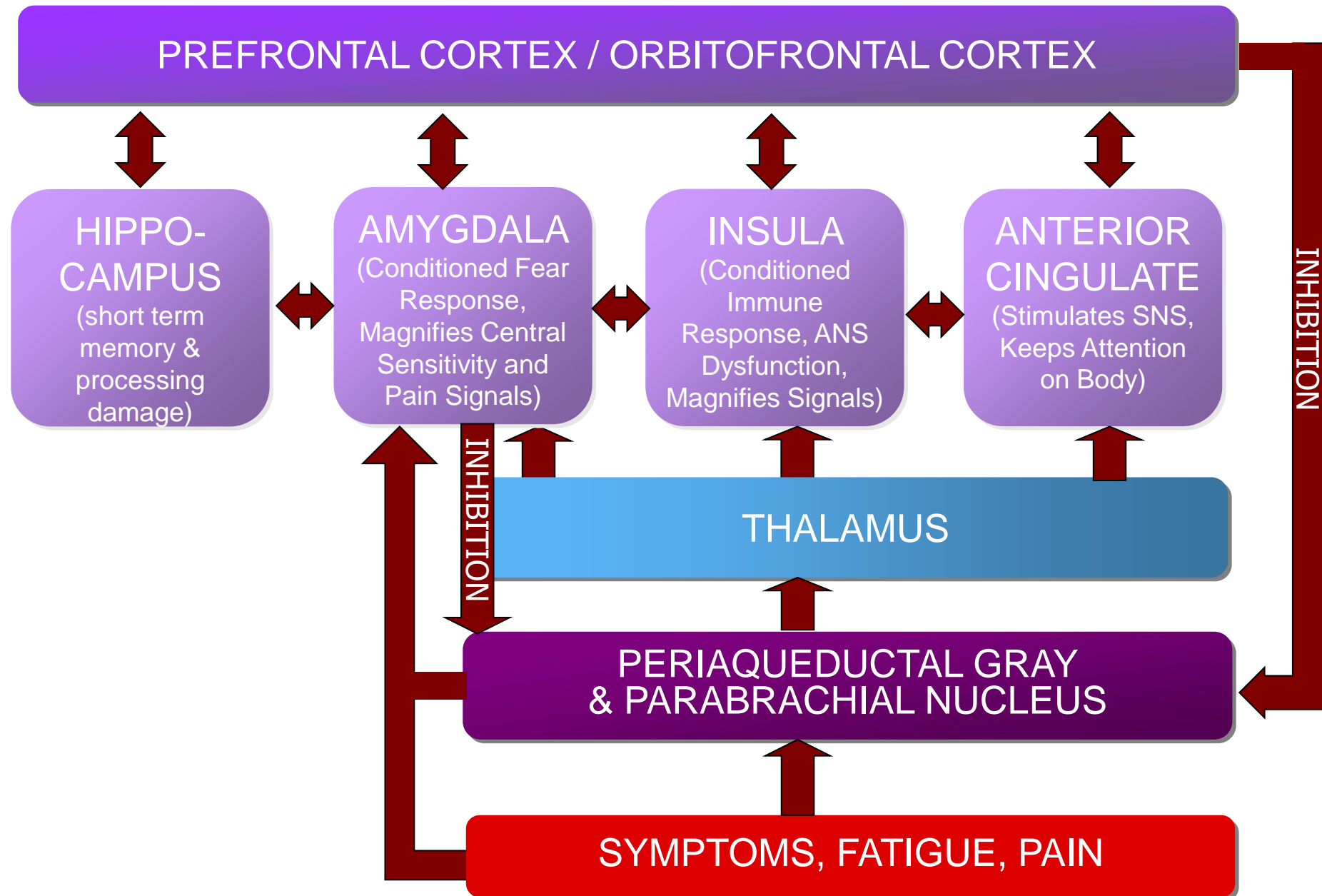
- produce an *emotionally relevant context for sensory experience*
- Sensations are judged as to its degree
- conveying homeostatic information to consciousness
- interoceptive awareness of body states
- autonomic functions
- regulating the immune system



# Role of Anterior Cingulate

- **Attention**
- Autonomic functions
- Stimuli processing
- Emotional reaction to pain
- Pain inhibition network

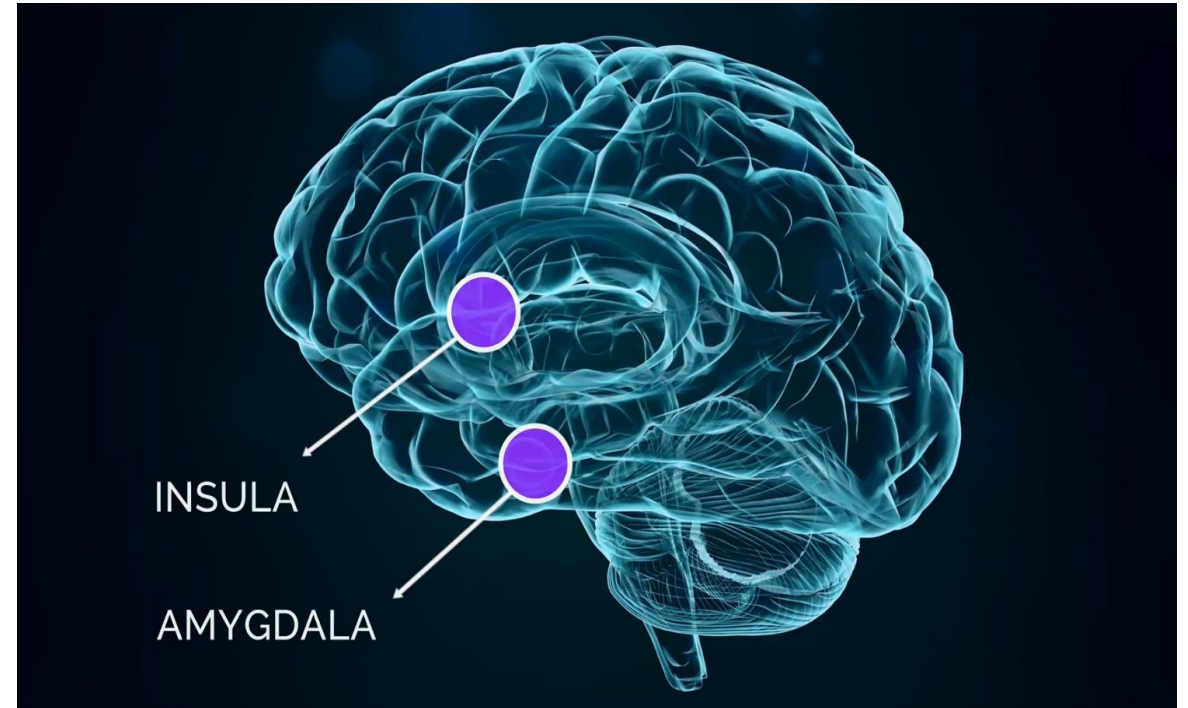
# NICS NEUROLOGICAL MODEL





# Amygdala & Insula Conditioning

When the brain is aroused it will feel vulnerable to milder threats, and errs on the side of caution; it over-protects



# Evidence pointing towards brain dysfunction

- Many brain abnormalities found including
  - Decreased grey matter volumes in Anterior Cingulate Cortex and Pre-Frontal Cortex, Amygdala and Hippocampus
  - Increased grey matter volume in cerebellum, for sensory processing
  - Increased activity in the Insula, Amygdala, Anterior Cingulate Cortex and Thalamus
- Inflammation and abnormalities throughout the viscera
- Studies showing abnormalities in amygdala function in MCS
- Stanford – EEG Delta Wave Function
- Animal Models



Animal studies by Dr Pachero-Lopez support conditioning in the Amygdala and Insula in response to immunological threats







## Post-Covid “Long Haul” Patients

- 5-10% of Patients may experience symptoms for months after recovering from Covid-19 (Zoe Symptom Study)
- Secondary pandemic of what we are terming "Chronic Post-Covid-19 Syndrome" or "CPCS"
- Cytokine Storm may trigger ME/CFS due to hyper-inflammation



# Amygdala and Insula Retraining – The Neuroplasticity Approach

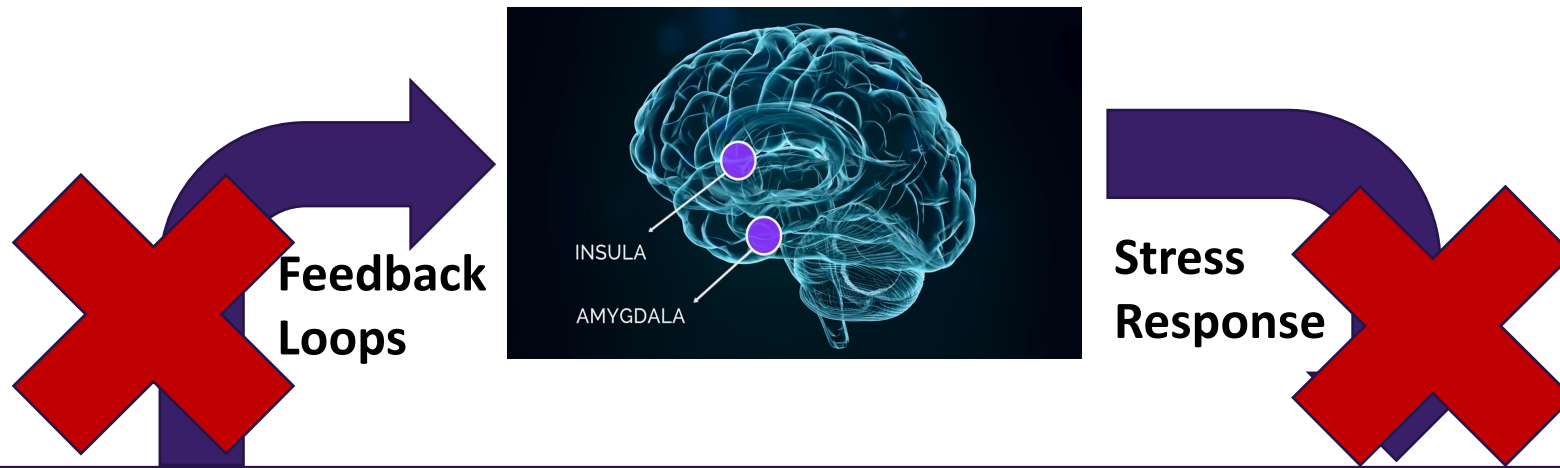


# Brain Retraining

- The brain becomes conditioned to react to chemicals
- BUT The brain is inherently re-wireable
- Neurons from the pre-frontal cortex to the amygdala and insula



# Perpetuation of SIBO after Sympathetic Hyperarousal



## CAUSES OF SIBO

1. HPA Axis triggering Cortisol, directly weakening immune system
2. Cortisol can weaken gut lining causing “leaky gut”
3. Stress reduces secretions such as bile, enzymes and stomach acid
4. Direct affect on gut bacteria and effects of “biofilm”
5. Impairment of gut motility, causing food to stagnate
6. Cortisol, Adrenaline and Noradrenaline causing Tightening of gut
7. Fluctuating sugar levels
8. Detoxification systems shutting down



# Research



## THE 3-R's OF RECOVERY

1. Retraining



2. Relaxing the  
Nervous System



3. Re-Engaging with Joy



# Mindfulness-Based Program Plus Amygdala and Insula Retraining (MAIR) for the Treatment of Women with Fibromyalgia: A Pilot Randomized Controlled Trial

- October 2020 Journal of Clinical Medicine 9:3246

## Results

- **Close to 40% Reduction in Fibromyalgia FIQ scores within 8 weeks**
- **50% Increase in perceived health status (EQ-VAS)**
- M+AIR demonstrated significantly greater reductions in functional impairment, clinical severity, anxiety, and depression, as well as higher improvements in health-related quality of life, mindfulness, and self-compassion at post-treatment and follow-up, mostly with large effect sizes
- A significant decrease in pain catastrophizing was found at follow-up, but not at post-treatment, with large effects sizes.





**47%**

**Increase in  
Perceived Health  
(EQ-VAS)**

**(16% in Control Group)**



**37%**

**Reduction in  
Fibro (FIQ) Scores**

**(0% in Control Group)**



**46%**

**Reduction in  
Pain  
Catastrophizing**

**(9% in Control Group)**



**45%**

**Reduction in  
Anxiety (HADS-A)**

**(15% in Control Group)**



**41%**

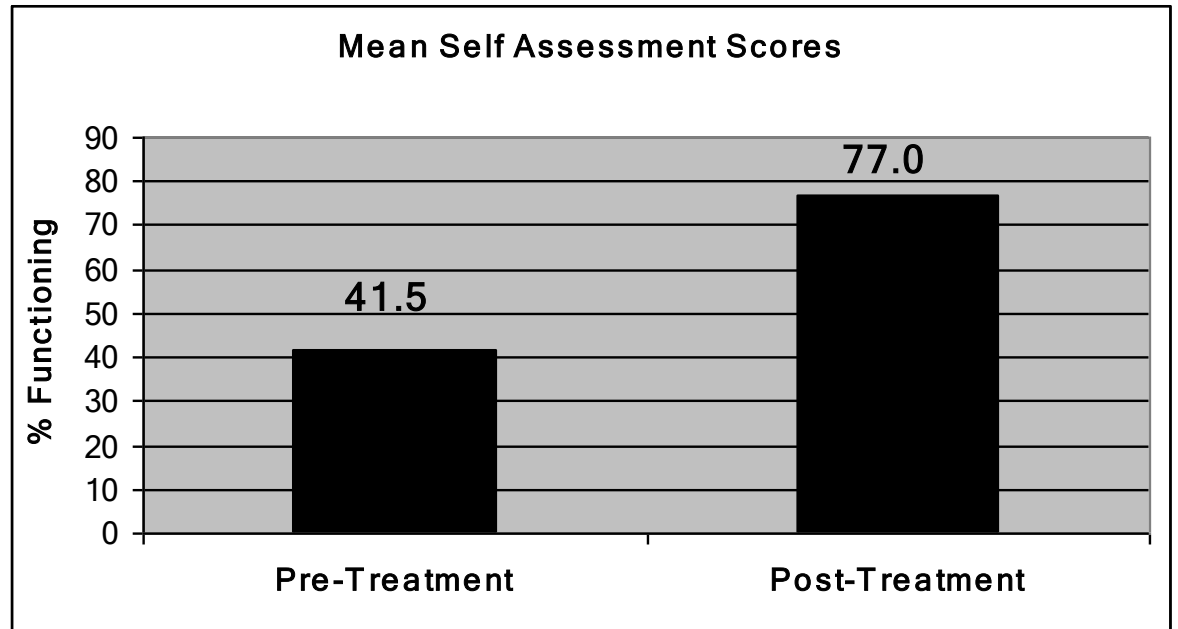
**Reduction in  
Depression  
(HADS-B)**

**(6% in Control Group)**

**Results  
(on average)**

# Clinical Audit Published Sept 2010

- Methodology
- Mean Age – 37.8 Yrs
- Mean years of illness – 10.5 Yrs
- Results
  - 92% of patients improved
  - Two-thirds of patients at 80-100% recovery
  - Many patients back in full time work



# Future Research

- Fund-raising
- Full medical trial on Patients

- Contact Details:

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