Is It All in The Brain?!

Integrating Brain Retraining "Neuroplasticity" Approaches into Your Practice for Improved Client Outcomes

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V1.4

A small body of determined spirits fired by an unquenchable faith in their mission can alter the course of human history.

~ Mahatma Gandhi

Chronic Inflammatory Illnesses

Neuro-Immune Conditions

- ME/Chronic Fatigue Syndrome (CFS)
- Long Covid
- Lyme Disease
- Irritable Bowel Syndrome (IBS)
- Adrenal Fatigue
- Certain Autoimmune Conditions

Environmental & Sensitivity-Related Conditions

- Mold Illness
- Mast Cell Activation Syndrome (MCAS)
- Multiple Chemical Sensitivities (MCS)
- Chronic Inflammatory Response Syndrome (CIRS)
- Small Intestinal Bacterial Overgrowth (SIBO)
- Drug Withdrawal
- Electrical Hyper Sensitivity (EHS)
- Food Sensitivities

Autonomic & Pain-Related Conditions

- Fibromyalgia
- Dysautonomia
- Anxiety/Panic
- Burnout
- Pain Syndromes / Migraines
- Postural Orthostatic Tachycardia Syndrome (POTS)

What We'll Cover Today

I. The "Neuro-Immune" Hypothesis for Chronic Conditions

II. Evidence Supporting the "Neuro-Immune" Hypothesis

III. Published Research

IV. Integrating Brain Retraining into Clinical Practice

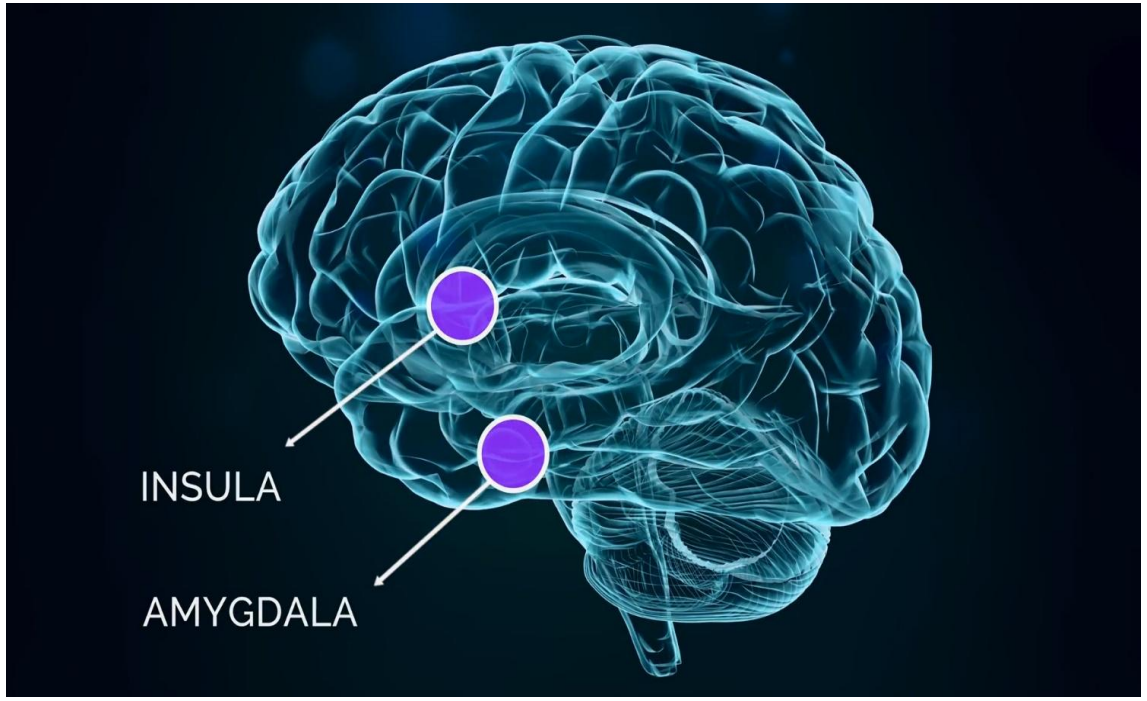
Section I

The “Neuro-Immune” Hypothesis for Chronic Conditions

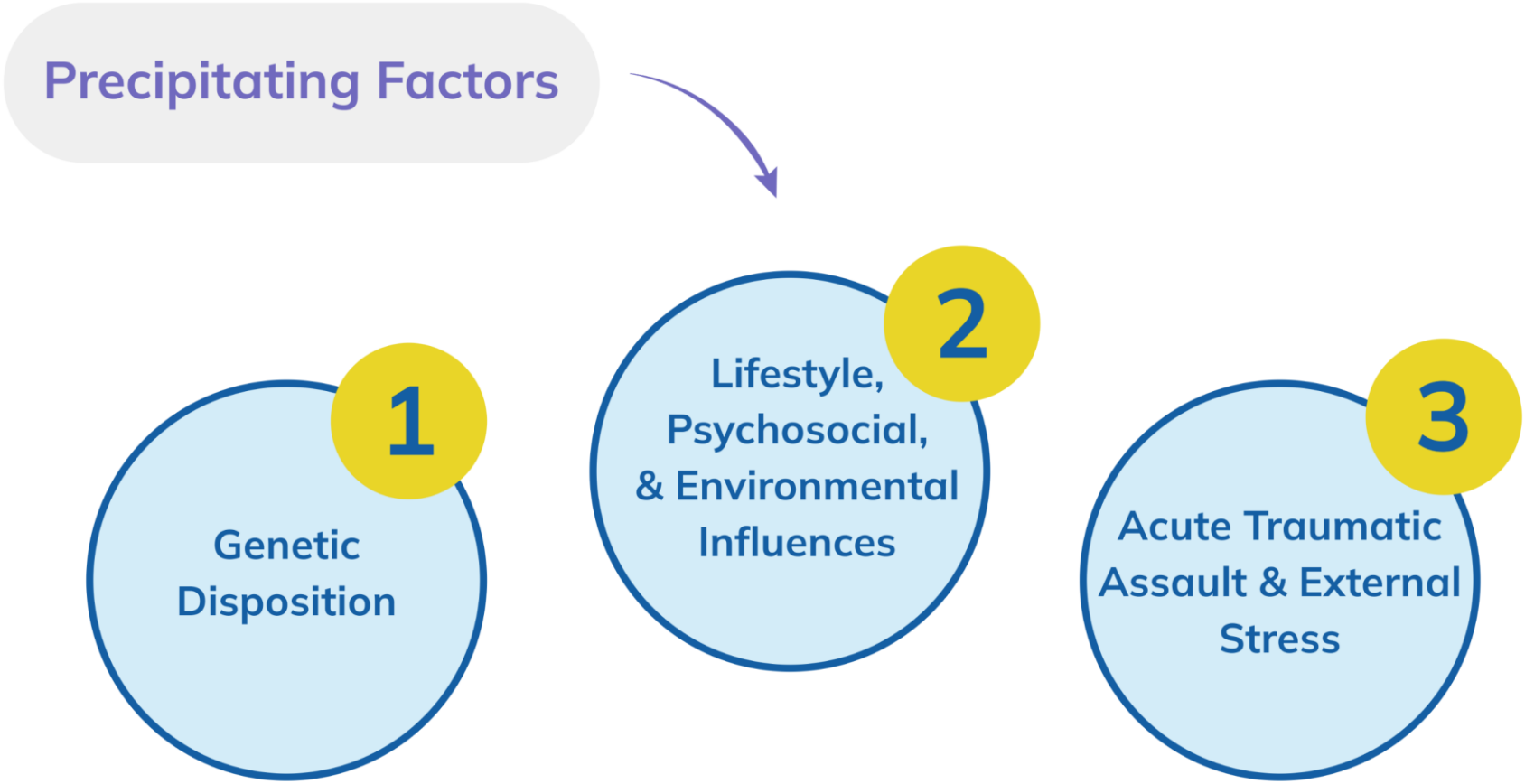
Why Are We Here?

The Amygdala & Insula Do *Not* Differentiate Between Threats

- ✓ Emotional
- ✓ Physical
- ✓ Chemical
- ✓ Biological

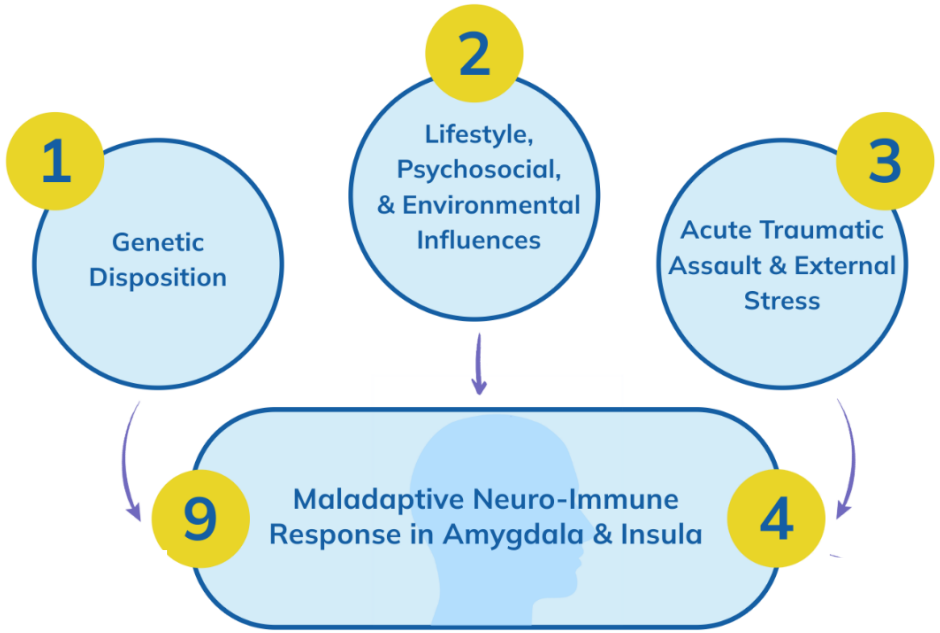


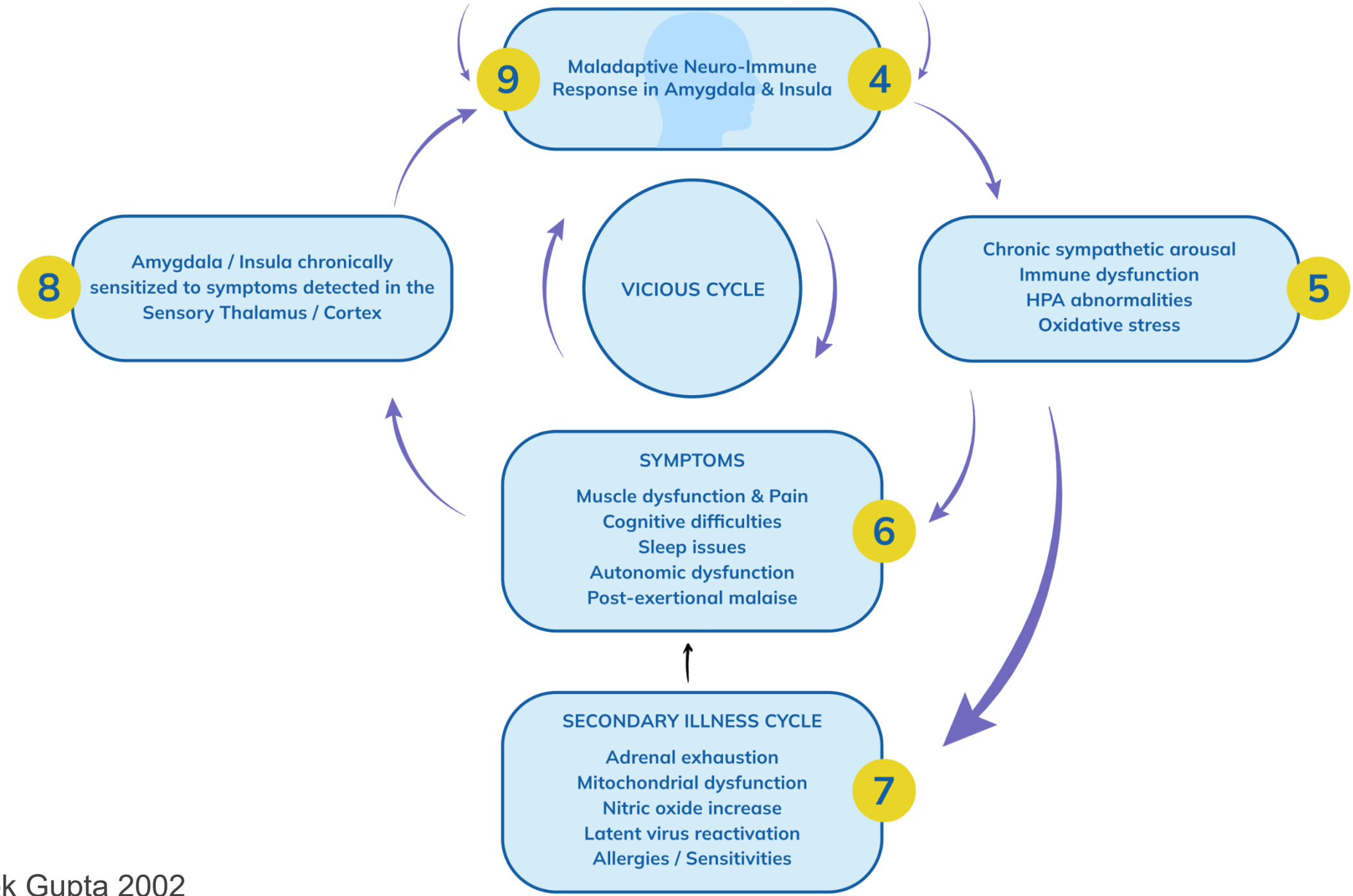
The Neuro-Immune Hypothesis



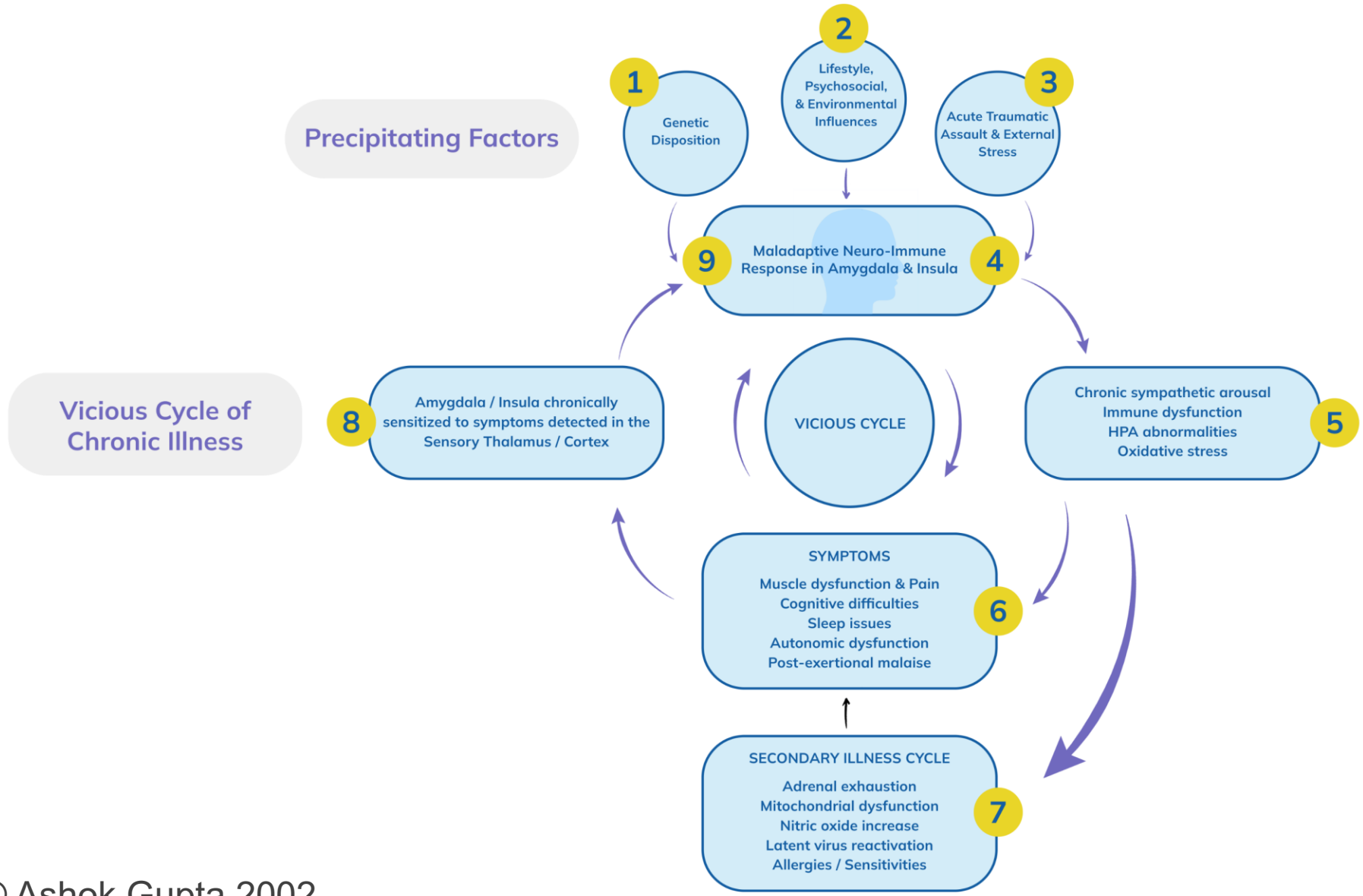
The Neuro-Immune Hypothesis for Chronic Illness

Precipitating Factors

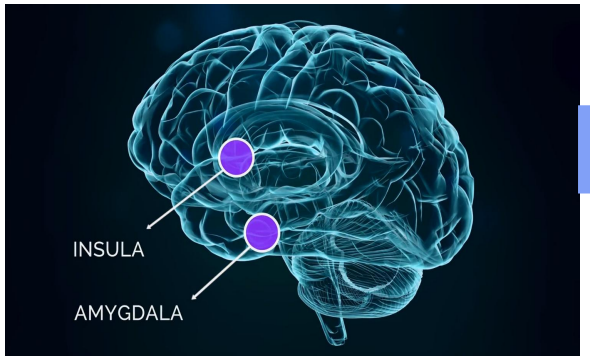




The Neuro-Immune Hypothesis for Chronic Illness



Brain/Gut Interaction after Sympathetic Hyperarousal



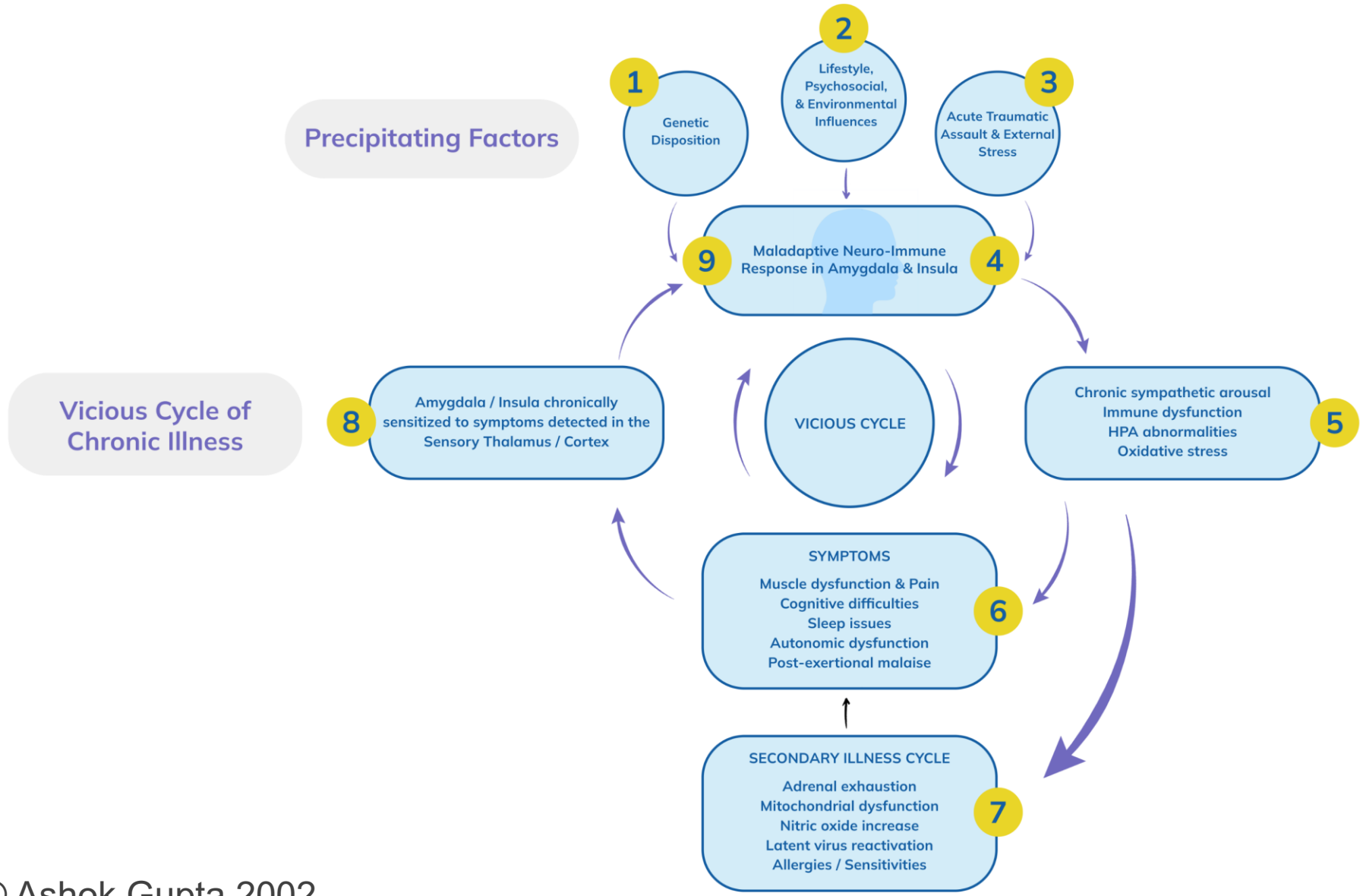
Feedback Loops

Stress Response

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 effect 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

The Neuro-Immune Hypothesis for Chronic Illness



THE 3-R's OF RECOVERY

1. Retraining

2. Relaxing the Nervous System

3. Re-Engaging with Joy

Section II

Evidence Supporting the Neuro-Immune Hypothesis

Evidence Pointing Towards Brain Dysfunction

- ✓ Inflammation and abnormalities throughout the viscera.
- ✓ Many brain abnormalities found including:
  - ME/CFS - Decreased grey matter volumes in anterior cingulate cortex and pre-frontal cortex.
  - Sensitivities: Increased grey matter volume in cerebellum, for sensory processing.
  - Chronic inflammatory conditions; Increased activity in the insula, amygdala, pre-frontal cortex, anterior cingulate and thalamus
  - Abnormalities in amygdala function in MCS

Animal Research Supports the Amygdala & Insula Premise

Conditioning in the amygdala and insula is a response to immunological threats

- Electrical activity in rat cortico-limbic structures after single or repeated administration of lipopolysaccharide or staphylococcal enterotoxin B.
  Raphael Doenlen, Ute Kru¨, Timo Wirth, Carsten Riether, Andrea Engler, Geraldine Prager, Harald Engler, Manfred Schedlowski and Gustavo Pacheco-Lopez. *Proceedings of the Royal Society B, 2010.*

- Neural Substrates for Behaviorally Conditioned Immunosuppression in the Rat.
  Gustavo Pacheco-Lopez, Maj-Britt Niemi, Wei Kou, Margarete Harting, Joachim Fandrey, and Manfred Schedlowski. *The Journal of Neuroscience, 2005*

Animal Research Supports the Amygdala & Insula Premise

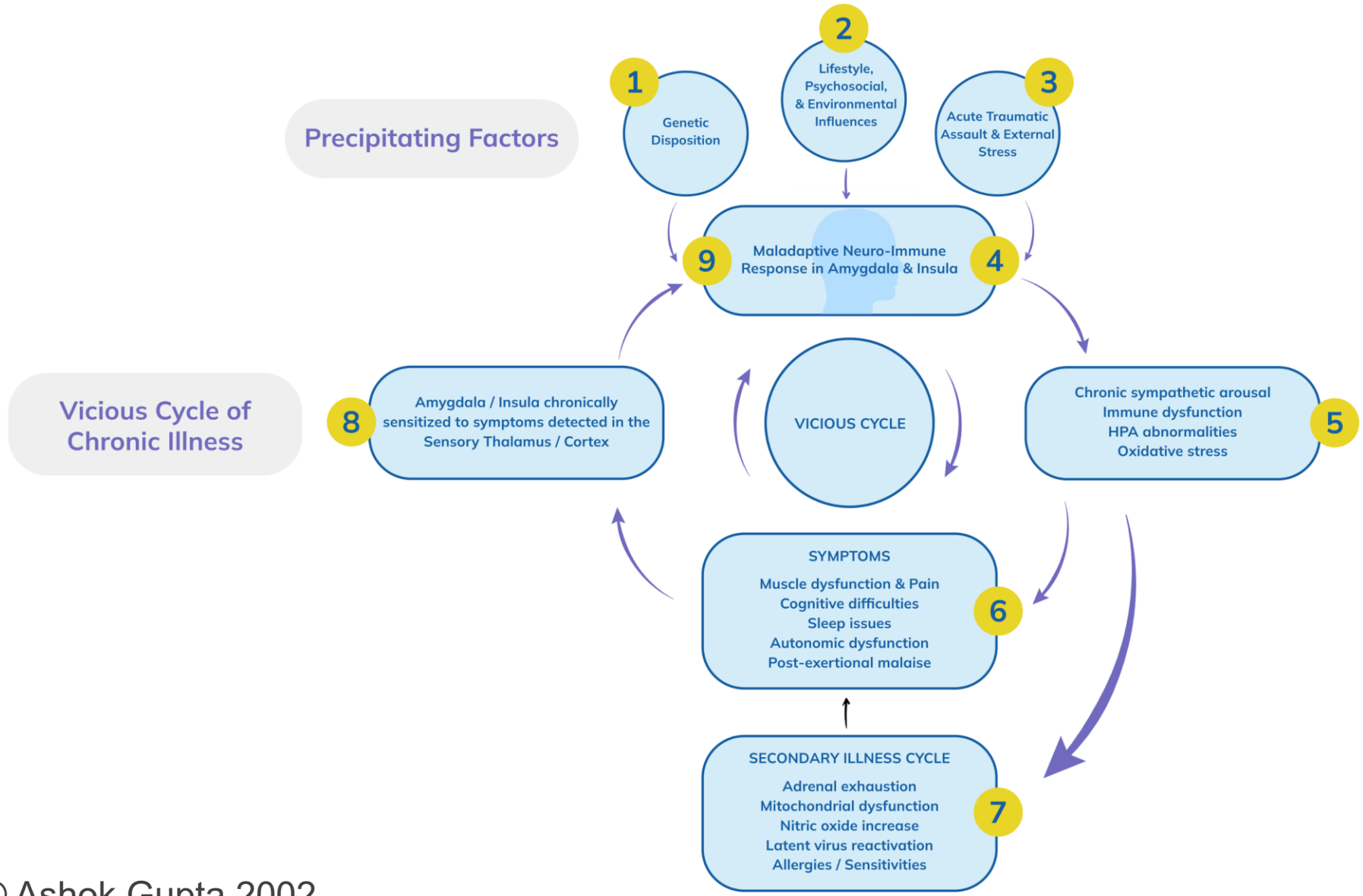
Immune reactivation in the Insula

SCIENTIFIC AMERICAN

"Many intestinal disorders, such as inflammatory bowel disease, are triggered by stress or strong emotions. The researchers think this causes neurons in the insular cortex to misfire, reactivating an immunologic memory and triggering a misguided immune response. They were able to successfully alleviate colitis in mice by simply decreasing activation in the insular cortex and suspect that placing human patients in a functional magnetic resonance imaging machine and teaching them to consciously reduce activity in that region could relieve gut inflammation with less dependence on medication."

Insular cortex neurons encode and retrieve specific immune responses: Tamar Koren, Re'ee Yifa, Mariam Amer, Oren Kobiler, Kobi Rosenblum, Asya Rolls. Cell VOLUME 184, ISSUE 24, P5902-5915.E17, NOVEMBER 24, 2021.

The Neuro-Immune Hypothesis for Chronic Illness



Brain/Gut Interaction after Brain Retraining

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Section III

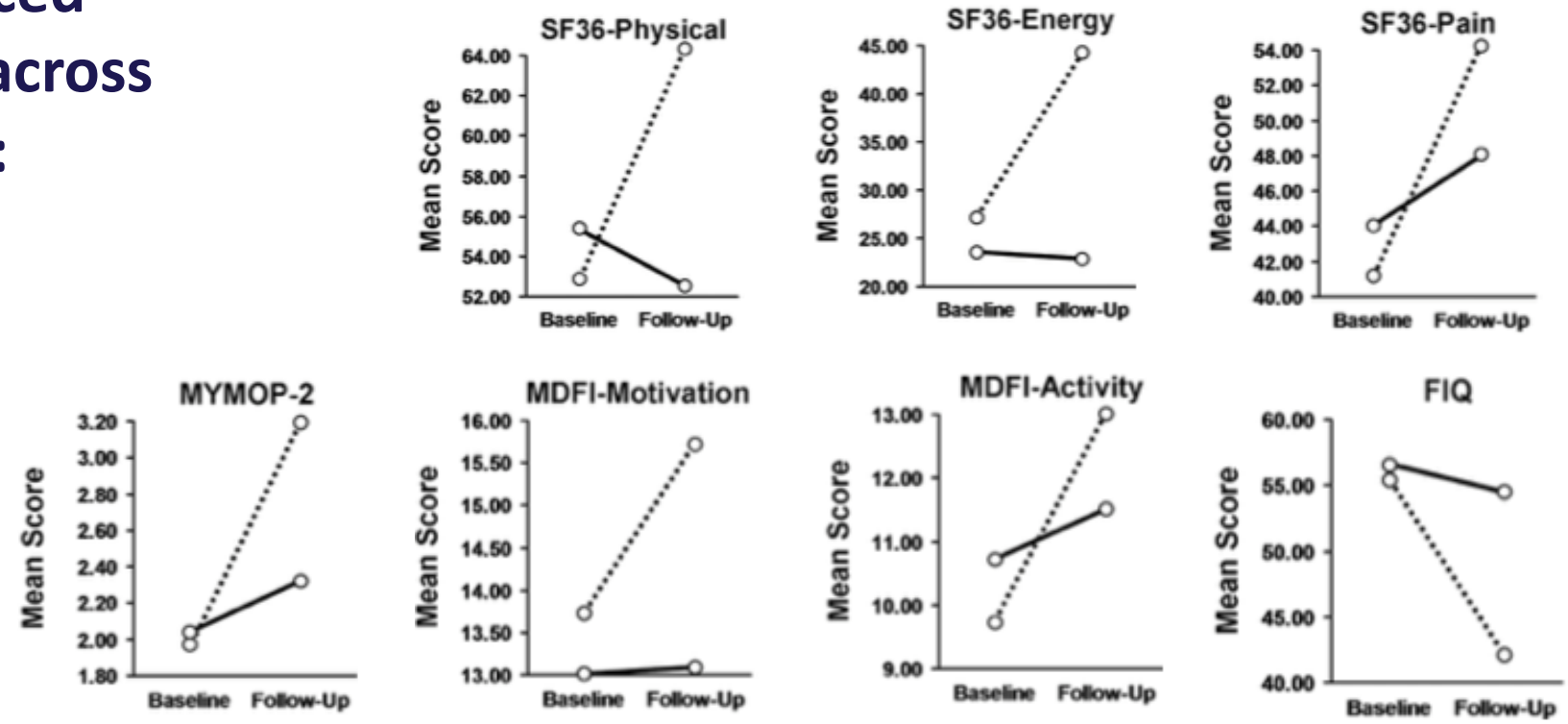
Published Research

2012 Mayo Clinic RCT: ME/CFS & Fibromyalgia

Compared to the control group, AIR participants experienced significant improvement across seven different measures:

- ✓ Physical health
- ✓ Energy
- ✓ Pain
- ✓ Symptom distress*
- ✓ Motivation
- ✓ Activity
- ✓ FIQ scores

Results after 12 Weeks



Dashed Lines = Intervention group (AIR + standard care)
Solid Lines = Control Group (standard care only)

*Measured by Measure Yourself Medical Outcome Profile (MYMPO-2).

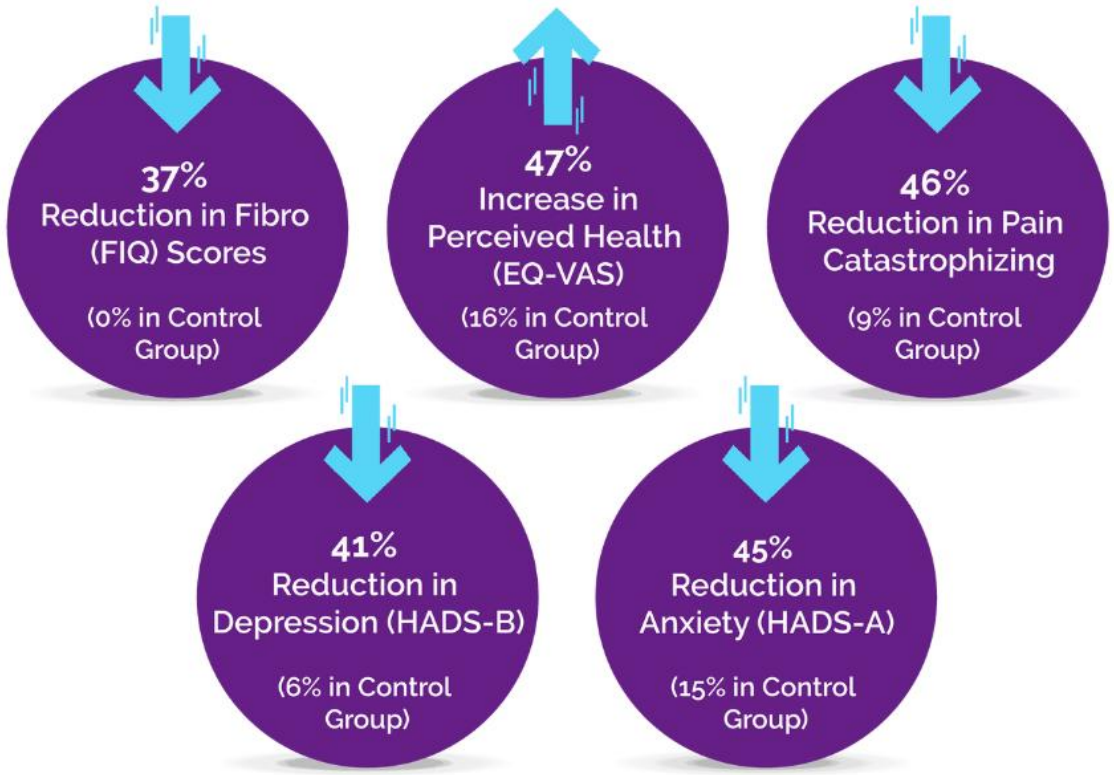
L. L. Toussaint, M. O. Whipple, L. L. Abboud, A. Vincent, and D. L. Wahner-Roedler, "A mind-body technique for symptoms related to Fibromyalgia and chronic fatigue," *Explore*, vol. 8, no. 2, pp. 92–98, 2012.

2020 University of Zaragoza RCT: Fibromyalgia

Compared to an active control group, M+AIR* participants experienced significant improvement across five different measures:

- ✓ **FIQ scores**
- ✓ **Perceived health**
- ✓ **Pain catastrophizing**
- ✓ **Depression**
- ✓ **Anxiety**

Results after 8 Weeks



*Intervention Group = M+AIR (Mindfulness-Based Program Plus AIR)
Control Group = Relaxation Therapy Intervention (structural equivalent of M+AIR)

*Mindfulness meditation is just one component of AIR. It was specifically called out in the study title due to funding from a mindfulness organization.

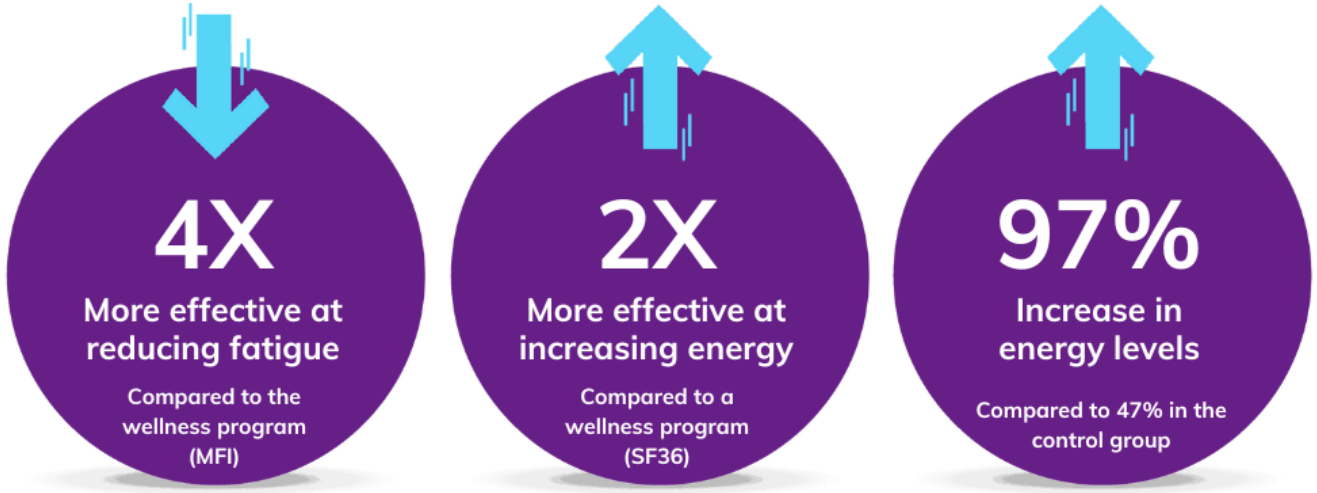
J. P. Sanabria-Mazo, J. Montero-Marin, A. Feliu-Soler et al., "Mindfulness-based program plus amygdala and insula retraining (MAIR) for the treatment of women with Fibromyalgia: A pilot randomized controlled trial," *Journal of Clinical Medicine*, vol. 9, no. 10, pp. 32–46, 2020.

2023 Luther College RCT: Long COVID

Compared to an active control group, AIR participants experienced significant improvement across two different measures:

- ✓ **Fatigue**
- ✓ **Energy**

Results after 12 Weeks



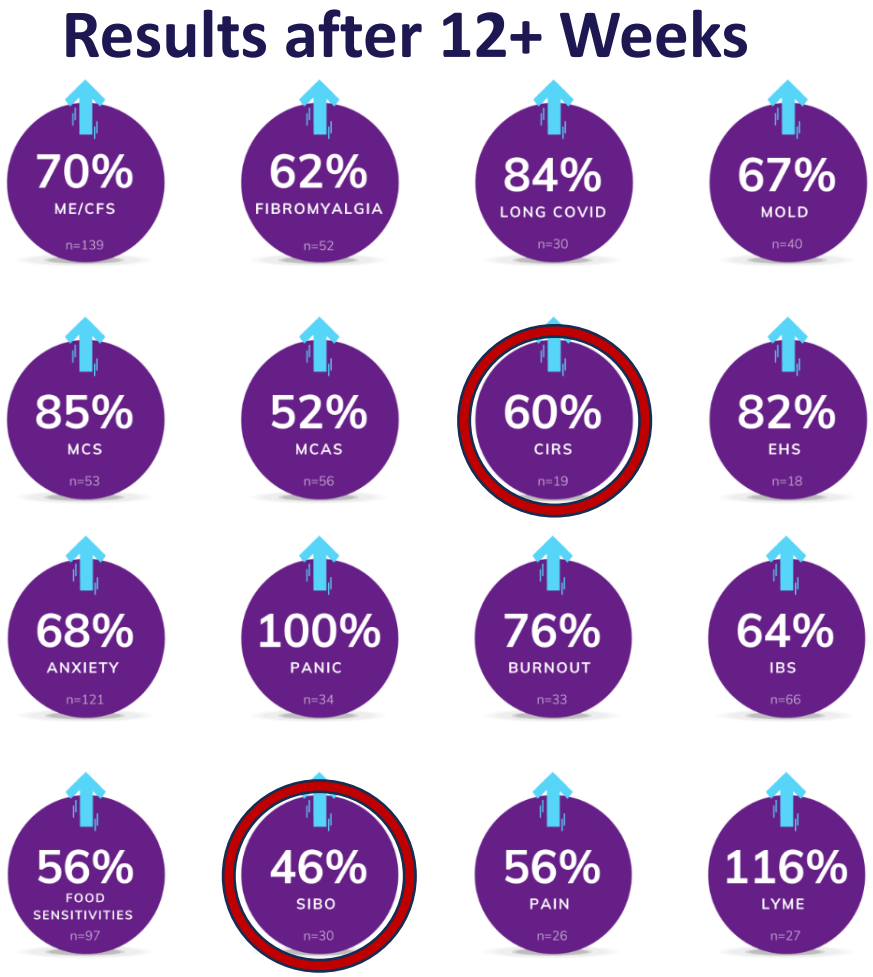
Intervention Group = AIR
Control Group = 12 Weeks to Wellness (structural equivalent of AIR)

L. L. Toussaint and A. J. Bratty, "Amygdala and insula retraining (AIR) significantly reduces fatigue and increases energy in people with long COVID," *Evidence-Based Complementary and Alternative Medicine*, vol 2023, Article ID 7068326, 2023.

2024 Published Independent Clinical Audit

AIR participants showed significant improvement across 14 different conditions for one key measure:

- ✓ **Overall health and functioning (modified version of EQ-5D Visual Analogue Scale)**



Integr Med (Encinitas). 2024 Jan; 22(6): 20–28.

Neuroplasticity Intervention, Amygdala and Insula Retraining (AIR), Significantly Improves Overall Health and Functioning Across Various Chronic Conditions

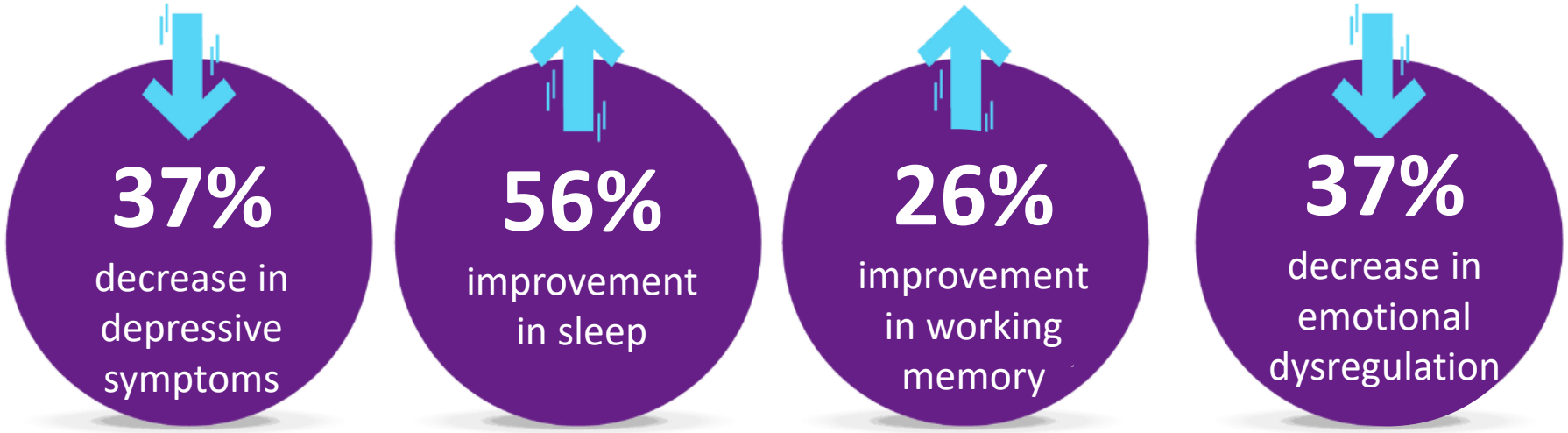
Alexandra J. Bratty, PhD

International online survey among *N* = 222 people suffering from one or more chronic conditions who reported actively using AIR for 3 months or more.

2024 Study on Sleep, Depression, Cognitive Decline

AIR participants plus exercise showed significant improvement across 4 different measures:

Results after 12 Weeks

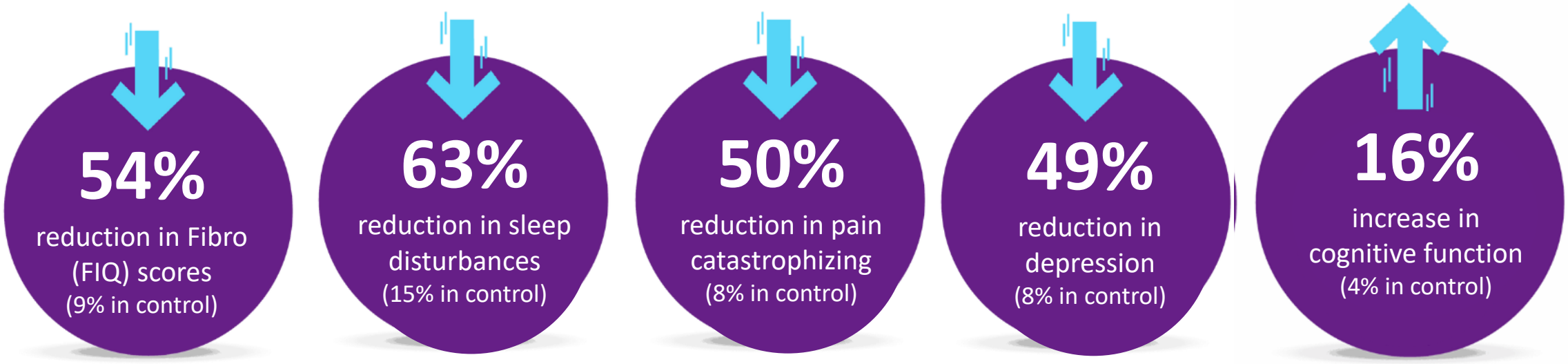


Badicu at al., Effects of an intervention combining physical activity and components of Amygdala and Insula Retraining (AIR) on sleep and working memory among older male adults[J]. AIMS Neuroscience, 2024, 11(4): 421-438. doi: 10.3934/Neuroscience.2024025

2025 RCT Study on Fibromyalgia

AIR participants showed significant improvements compared to a control taking Pregabalin:

Results after 12 Weeks

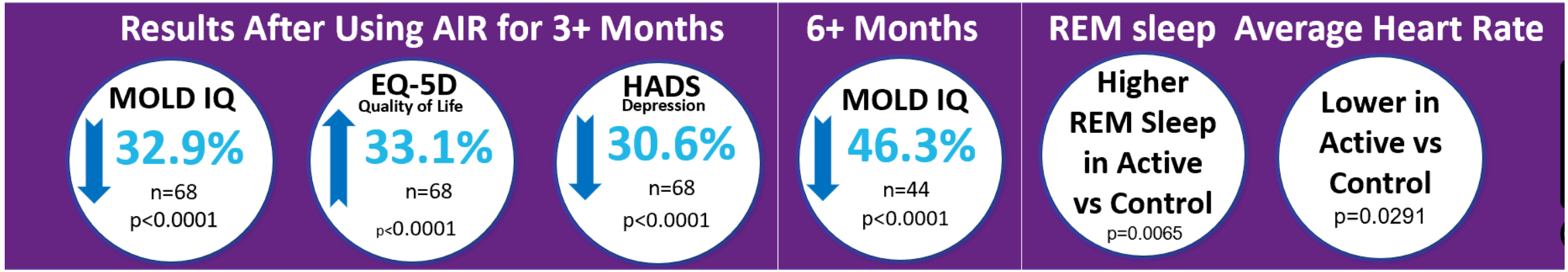


Norouzi, E., Pournazari, M., Joybari, T.A. *et al.* Two non-pharmacological interventions, amygdala and insula retraining (AIR) and physical activity, are both significantly more effective than standard medication in improving symptoms of fibromyalgia. *Curr Psychol* (2025). https://doi.org/10.1007/s12144-025-07808-w

2026 Pre-Publication RCT Study on Mold Illness

Neuroplasticity "Amygdala and Insula Retraining (AIR)" Significantly Improves Mold Illness:

Results after 12 Weeks



Neuroplasticity “Amygdala and Insula Retraining (AIR)” Significantly Improves HRV, CRP & Autonomic Symptoms in Long Covid

(pre-publication results provided by Professor Leonardo Tamariz, University of Miami)

Results of 66 patients with Long Covid randomized to two groups

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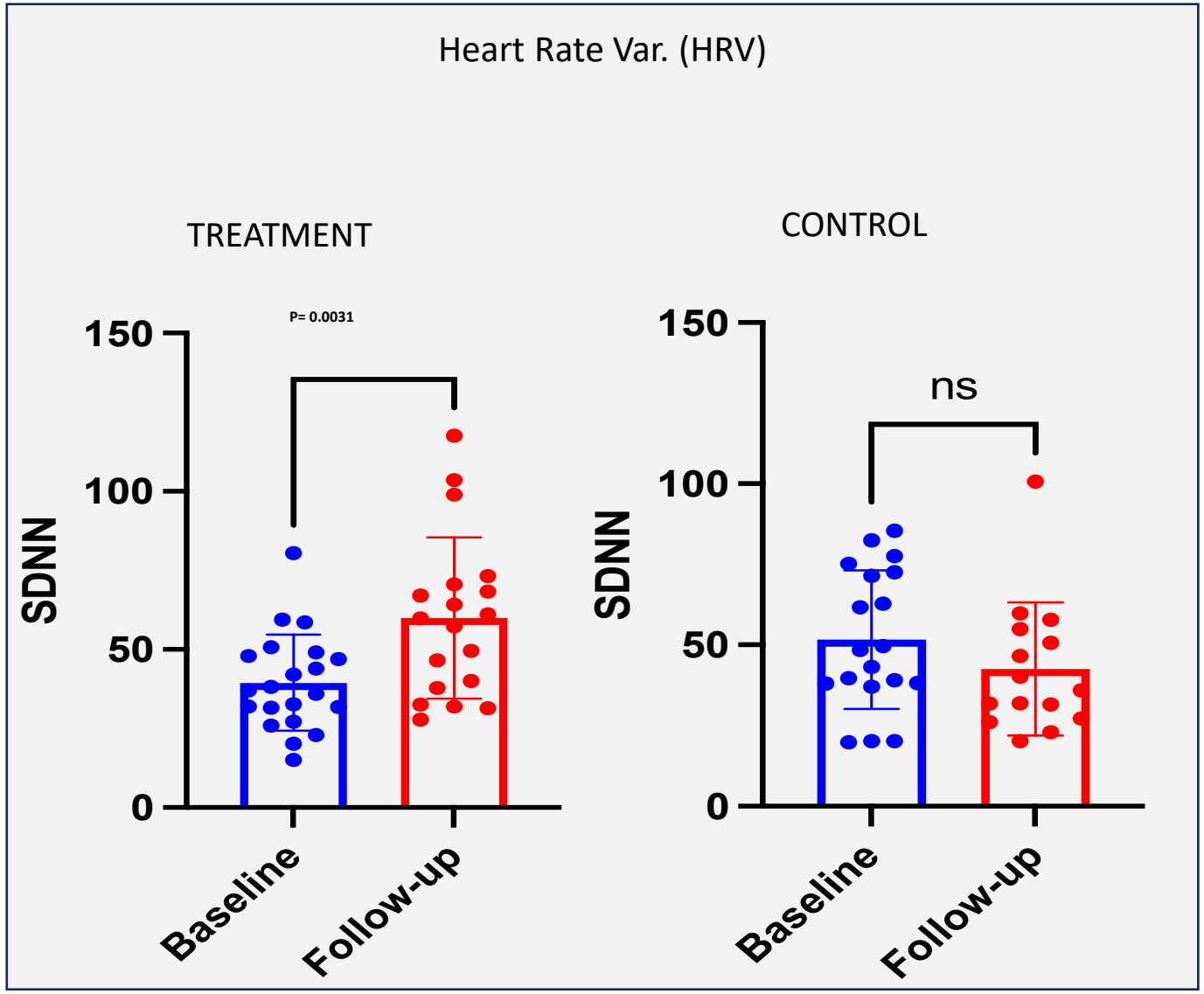

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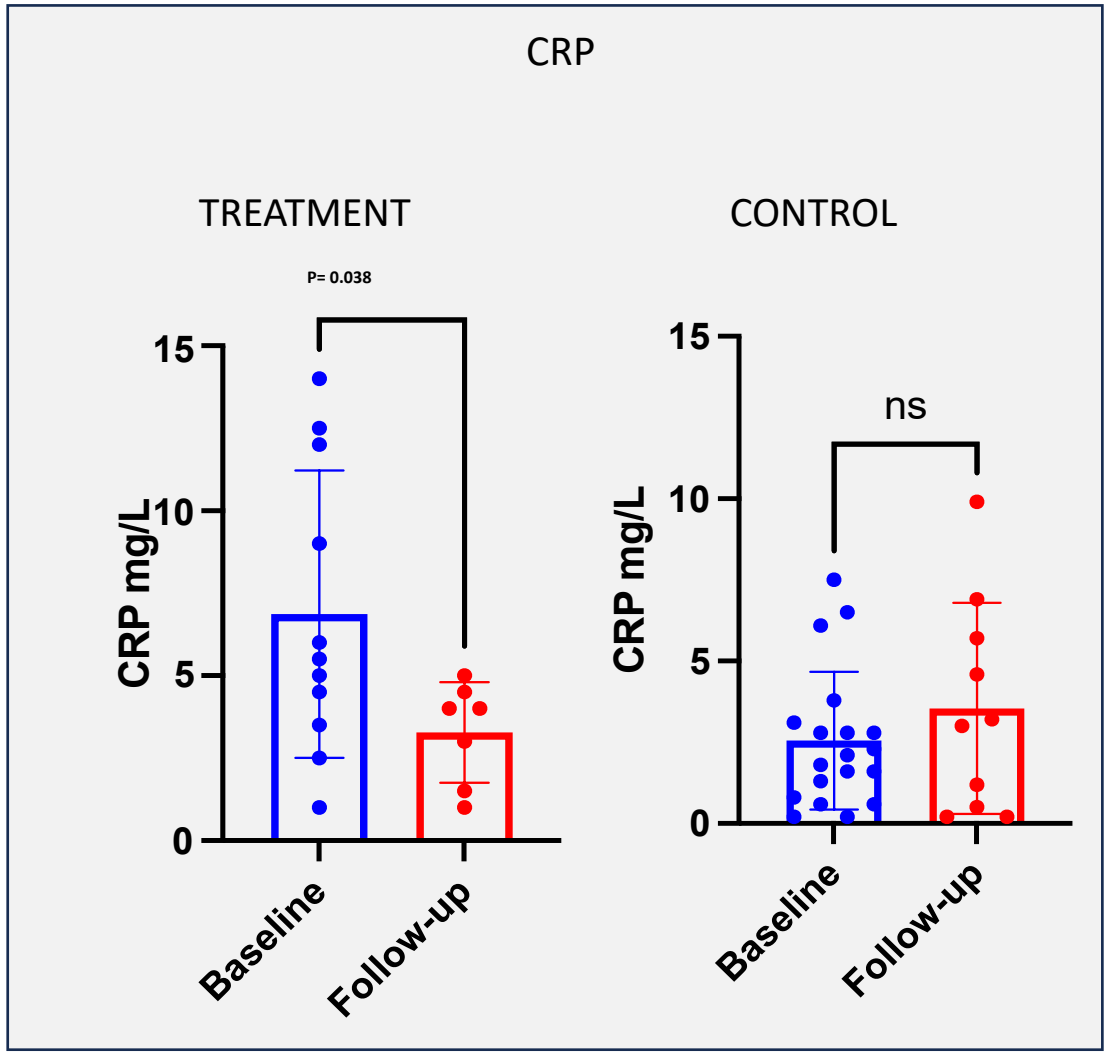

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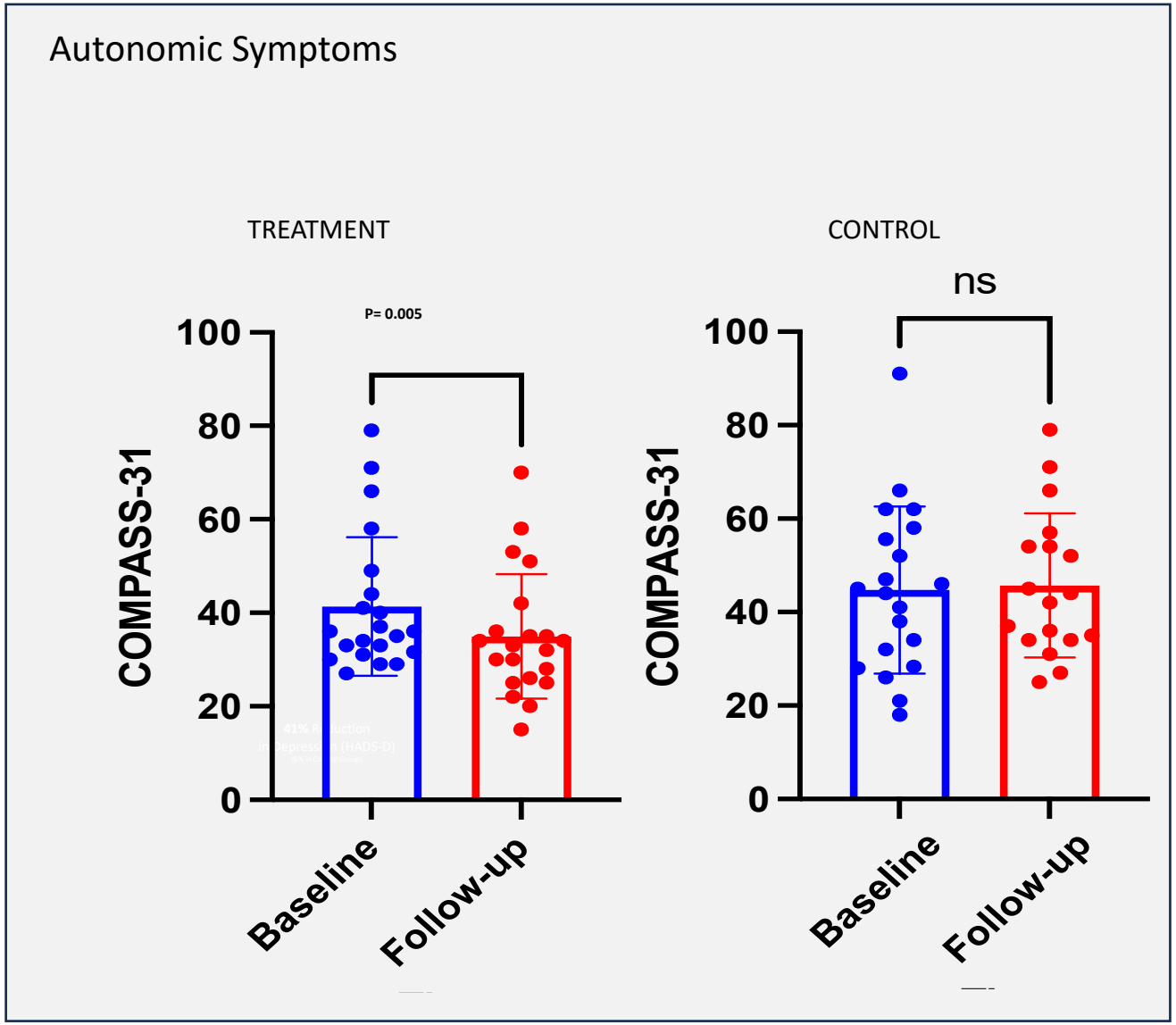


Section IV

Integrating Brain Retraining into Health Practice

THE 3-R's OF RECOVERY

1. Retraining

2. Relaxing the Nervous System

3. Re-Engaging with Joy

When Are Practitioners Integrating Brain Retraining?

Before

- Client is sensitive to medications & supplements

During

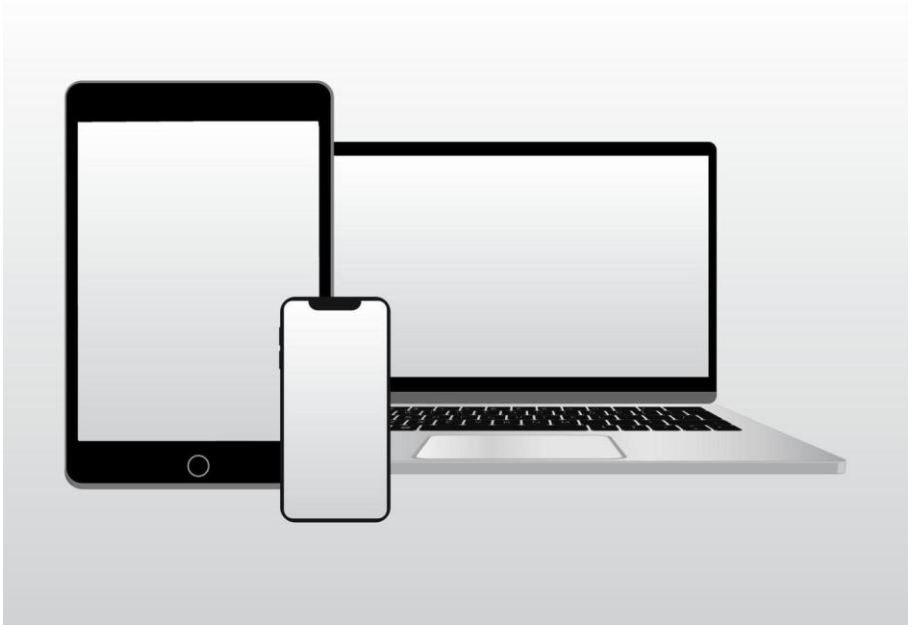
- Client can manage a parallel treatment

After

- Client benefits from other obvious medical interventions first

What Is the Package of Brain Retraining?

- ✓ Member website & mobile app
- ✓ Ai 24hr Support
- ✓ Interactive Video Sessions
- ✓ Audio Exercises
- ✓ Optional Daily Zoom Sessions
- ✓ Weekly Webinars (Live & Recorded)
- ✓ Supportive Community



Section V

Next Steps

Future Research

- ✓ Interested in launching RCTs focused on:
  - Long COVID
  - Fibromyalgia
  - ME/CFS
- ✓ Exploration for RCTs among other conditions:
  - Alzheimer's
  - MCAS
  - Lyme
  - Mold
  - Mental Health Conditions

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