



# Expanding the Scope of Brain Wellness

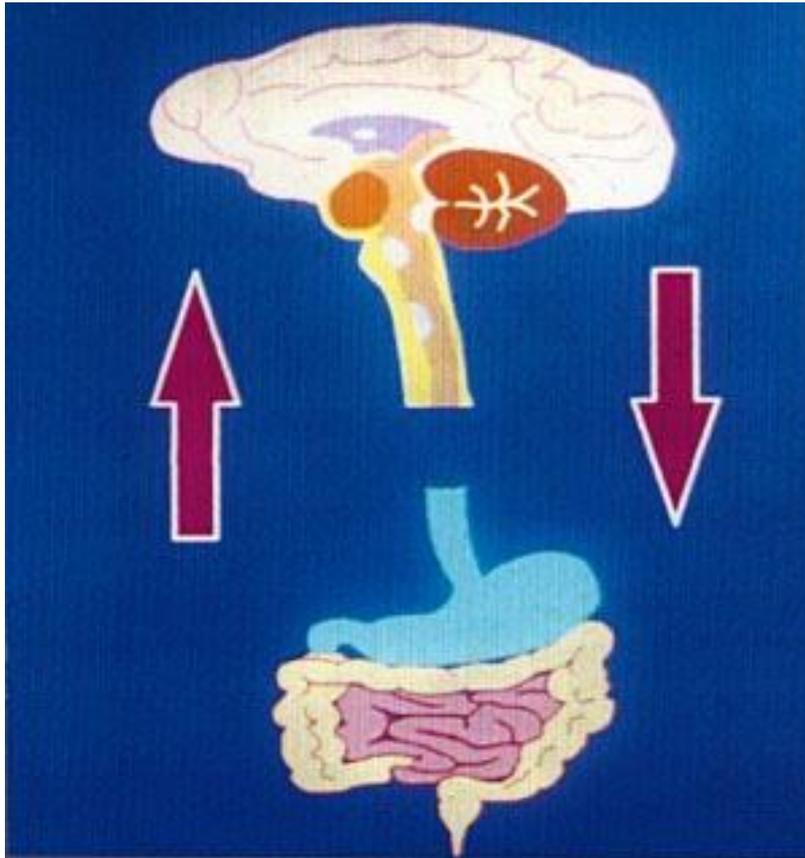
Pam Machemehl Helmly  
*Founder and Chief Science Officer*



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# A Few basics:

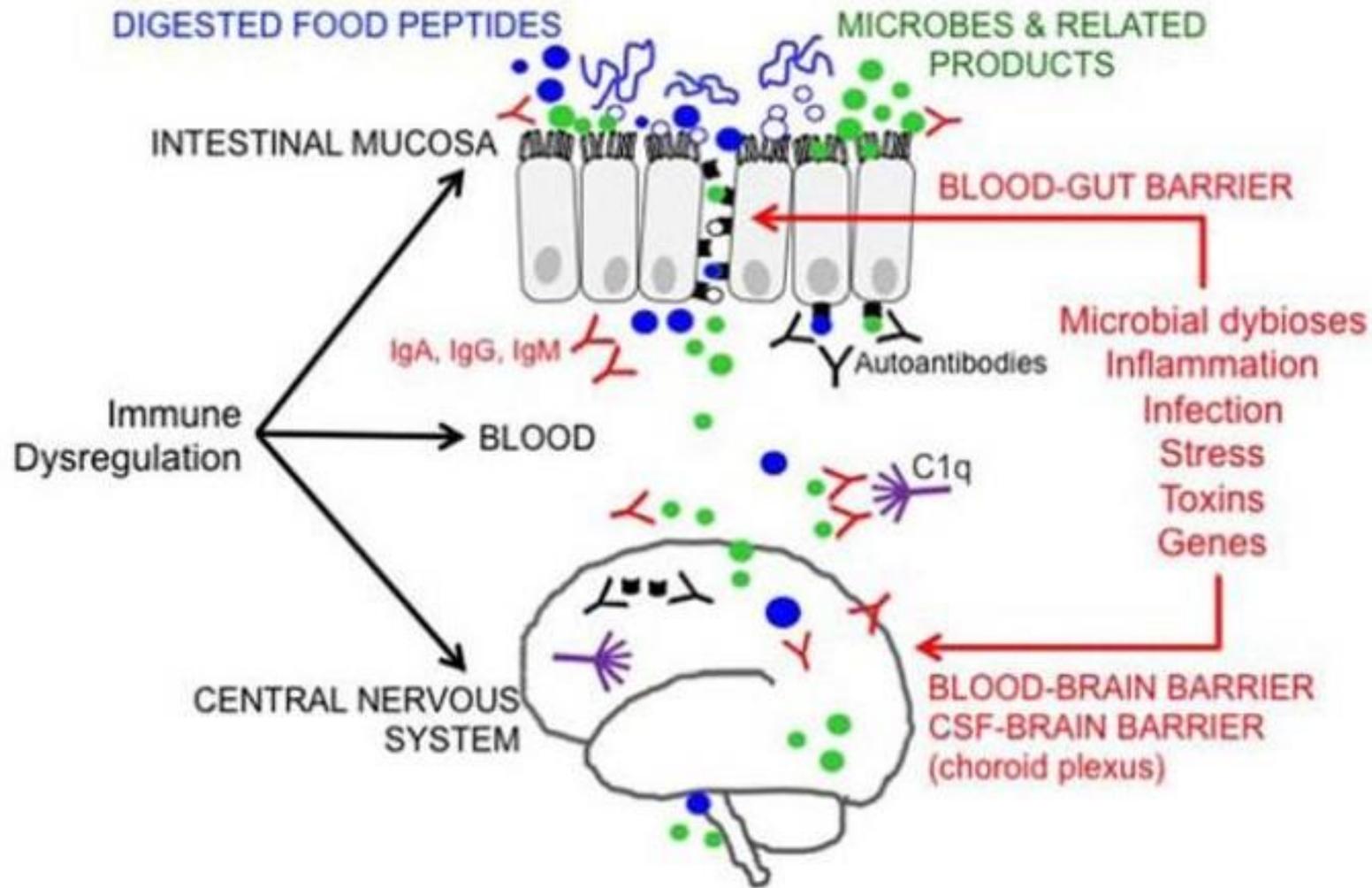
Healthy Digestion + Good Goods = Well-Fed Body and Brain



- The Body and GI Tract are integrally related.
- Clean GI Tract
  - Low Inflammation
  - Excellent Absorption
  - Good Communication
- Effect on Adrenals Reduced
- Improvement on Toxin Elimination



# A Few Basics: The Gut Brain Connection





So...What can we do after diet/GI tract is in order to balance the brain



# Neurotransmitters 101



- 100 + neurotransmitters
- Ideally, all vesicles (cups) are full at birth
- Genetics and birth order play a role
- Stress and Trauma spills NT's out faster than we can make them from diet
- Proteins help replenish NT supplies



# Excitatory vs. Inhibitory Neurotransmitters

- Excitatory or Stimulating Neurochemicals
  - Dopamine (focus, joy, libido)
  - Norepinephrine (drive, energy, focus)
  - Epinephrine (stress response)
  - Glutamate (focus, anxiety, alertness)
  - Histamine (inflammation, focus)
- Inhibitory or Calming Neurochemicals
  - Serotonin (mood, carbohydrate cravings)
  - GABA (calm, stress response)
  - Glycine (calm, trauma response)



# What Precipitates Imbalance...



# Factors That Cause Imbalance

- Poor Diet or Digestion
- Genetics
- Chronic Stress
- Organ Disease
- Some Medications (drug induced nutrient depletions)
- Excessive Exercise or Excessive Fasting
- Recreational Drug Usage
- Trauma to the body or brain



# Brain Imbalance

## **Inadequate brain chemicals from lack of proteins or rotation of proteins in the diet**

- Fluctuations in mood, focus, sleep cycle
- Improper responses to stimuli
- Inability to repair gut and muscles

## **Inadequate good fats from the diet (depression, lack of myelination)**

- Cold Fresh Water Fish
- Raw almonds and freshly cracked walnuts
- Olive Oil

## **Too many pro-inflammatory fats in the diet**

- Fast Foods
- Too many omega 6 nuts – cashews, pecans



# Why Test?

- Even if food sensitivities are removed – the brain will be imbalanced from the many years of consumption of those foods
- You cannot behavior modify an imbalanced brain
- Post Trauma – neurotransmitter levels can be very high or very low
- In order to perform therapies, a balanced brain achieves outcomes quicker
- Identifying imbalances allows for a specific path forward
- Testing can be completed even when the patient is on medications



# Sample Panel:

Parameters	Your Results (1/3/2023)	Previous Results (6/2/2021)	Reference Range	Plays a Role In
Serotonin	100.7	122.8	79-129	Sleep cycle, depression, anxiety, carbohydrate cravings, PMS
Dopamine	313.2	282.9	125-175	Focus, attention, memory, motivation/drive, mood, addictive disorders
Norepinephrine	57.8	105.0	30-55.9	Energy, drive, stimulation, *fight or flight *response, sleep cycle disturbances anxiety
Epinephrine	5.0	11.5	8-12.9	*Fight or flight* response, metabolism, energy, depression, cognitive function.
Norepi/Epi Ratio	11.5	9.1	3-6	Ratios < 3 = restlessness, over-training Ratio > 6 = stress, tiredness, lack of focus, energy & motivation, *burn out*
GABA	1039.5	469.8	820-1200	Reduces excess stimulation. Anxiety, nervousness, restlessness, and sleep cycle
Glutamate	20.4	15.9	5-16	Agitation, impulsivity, anxiety, focus issues, sleep cycle disturbances, tics, migraines, headaches when elevated. Depression when low.
Glycine	1700.6	1851.2	375-1250.9	Anxiety, nervousness, and sleep cycle.
Histamine	48.5	51.5	6-43	Responds to allergy and inflammation, low levels cause lethargy. High levels can contribute to poor concentration, focus, or memory, attention issues.
Creatinine	81.1	104.3	10-250	Determines whether sample is viable for testing (hydration/dehydration)

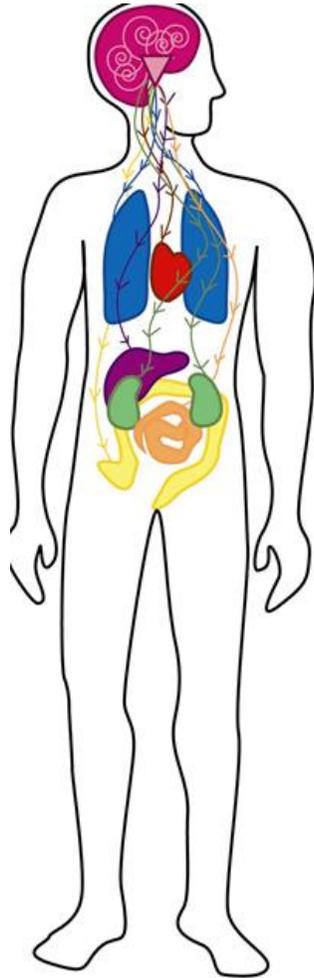


# Neurotransmitter Imbalances

NT	Excretion	NT	Excretion	Cause/Result
Serotonin	↑	GABA	↑	Overall Stress
Serotonin	↓	GABA	↑	GABA Compensation
Dopamine	↑	Histamine	↑	GI Inflammation
Dopamine	↑	Histamine	Normal	Genetics, anti-histamine usage
Norepinephrine	↑	Epinephrine	↑	Low inhibitory NT's or GI distress
Norepinephrine	↑	Epinephrine	↓	Poor conversion
Glutamate	↑			Diet/poor balance between serotonin and dopamine
Glycine	↑			Trauma, supplementation



# Neuroendocrine Communication



- When brain perceives stress, it will communicate with the adrenals for help
- Adrenals send out stimulating hormones and neurotransmitters to assist
  - Cortisol
  - Norepinephrine
  - Epinephrine



# Sleep and Adrenal Health

- Adrenal rebuilding impossible without a good sleep cycle.
- Adequate calming neurotransmitters (serotonin and GABA) are needed to reduce excessive excitatory neurotransmitters that may be excreting in response to stress causing wakefulness or improper awakening
- Sleep is tricky – ample quantities of excitatory AND inhibitory neurotransmitters are required for a good sleep cycle. (Serotonin, GABA and Norepinephrine regulate sleep cycle along with melatonin)
- Dietary chemicals must be avoided for good sleep. These include brain neurotoxins such as MSG, DSG, aspartame and stimulants.



# Sleep Loss and The Effect on the Brain

- Lack of Sleep Decreases Cognitive Function
- Increases risk of Diabetes
- Contributes to Depression
- Decreases Memory
- Impairs Judgment
- Weight Gain



# Hormone Balance

- Progesterone stimulates the MAO enzyme that “eats up” neurotransmitters
- Estrogen inhibits the MAO enzyme reducing the breakdown of neurotransmitters
- Testosterone is excitatory or stimulating in nature

Why is this important? Puberty, Peri-Menopause, Menopause, Andropause, Fertility

It is all about Balance!



# Neurotransmitters and Focus

- Elevated Excitatory Neurotransmitters worsen focus and short-term memory (example: ADHD)
- Inefficient Dopamine in those that are focus challenged but without excessive movement or hyperactivity (example: daydreamers or ADD)
- Elevated norepinephrine without elevated dopamine (example: Type A personalities or those with hyperfocus)
- Elevated Histamine levels can be the sole culprit to issues with catecholamines
- Inadequate stimulating neurotransmitters due to overuse of stimulant medications, coffee, etc. can cause focus issues



# Other Factors Affecting Focus

- Auditory and Sensory Processing Disorders
  - Sensitive to Loud Noises, Bright Lights, Tags on Clothing, Food Textures
  - Missing words within instructions (not hearing all the clues)
- Environment
  - Over-stimulating (too much input for the brain)
  - Under-stimulating (need for sound to sleep, study)



# Genetic Considerations

- Certain Genetic SNP's can make it difficult to synthesize neurochemicals easily
- Other Genetic SNP's can make detoxification inefficient
- A more well-known SNP combination of up to 16 genes can make methylation problematic (creates a need for a specific form of folic acid or other methyl donors)



# Genetic Considerations

rsID	Gene	Genetic Result	Therapeutics Associated With Positive Result	Highly Recommended Therapeutics / Neurobiologix Formulas	Provider Discretion: As Needed Formula Recommendations	Lifestyle Recommendations
NEUROTRANSMITTER						
rs4680	COMT V158M	+/-	B2 (Riboflavin), Methyl Donors (Taurine, Choline, Trimethylglycine (TMG), Dimethylglycine (DMG), Inositol, L-Methionine			Higher Risk of Depression / Anxiety
rs6323	MAO-A	-/NA				
rs1799836	MAO-B	-/NA				
rs769407	GAD1	+/-	Prescription Amantadine, Ketamine, Glycine, N-Acetyl-Cysteine (NAC), Zinc, Magnesium, Oxaloacetate, Elderberry, L-Theanine, Melatonin	<b>Prescription Amantadine</b> if Anxiety or Sleep Initiation Issues are present		Be cautious with MSG (monosodium glutamate) exposure and glutamine supplementation
rs3828275	GAD1	+/-				



# Technology and Dopamine

- Dopamine is one of our main focus neurotransmitters aka the “feel good” neurotransmitter
- Many illegal drugs affect dopamine causing addiction (meth, cocaine, heroin)
- Blue Light causes us to over-excrete this neurotransmitter



# The In Utero Experience

- Maternal Stressors can affect the child's neurochemical balance
- Fetal alcohol or drug exposure increase the likelihood of focus issues
- Maternal diet and overall health
- Birth Order
- Cortisol sharing between mother and child during 3<sup>rd</sup> trimester



# In Summary...

- Balanced protein, carbs and fats are necessary to keep gut healthy and to replenish neurotransmitters
- Rotation of proteins is necessary to synthesize all neurotransmitters
- Co-factors for metabolism and synthesis of neurotransmitters must be consumed or supplemented
- Adequate Water consumption is imperative
- Exercise for detoxification
- Stress Management
- Testing allows data to achieve better balance



# How can I work with M<sup>2</sup>?

- Go to: <https://www.m2institute.com/practitioner-application>
- Utilize Practitioner Services for any questions:
  - Phone: 888-257-9068 ext. 3
  - Email: [clinician@m2institute.com](mailto:clinician@m2institute.com)

*Thank you for Participating today!*

