Anxiety, Depression, & Emotional Trauma Root Causes, Effects of Your Body & Directions for Treatment

Brought to you by:

Dr. Jess P. Armine

and

The Center For Bio-Individualized Medicine

www.drjessarmine.com

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BIO-INDIVIDUALIZED MEDICINE
FUNCTIONAL & INTEGRATIVE MEDICINE

What We Hope To Accomplish Tonight

- ✓Define Anxiety
- ✓Define Depression
- ✓Define Emotional Trauma
- ✓How Do the Above Effect Your Physiology
- ✓How to Determine Root Causes
- ✓What Are The Treatment Options

Anxiety is an *Emotion* characterized by:

- An unpleasant state of inner turmoil
- accompanied by nervous behavior, such as pacing back and forth, somatic complaints and rumination.
- It is the subjectively unpleasant feelings of dread over anticipated events, such as the feeling of imminent death.

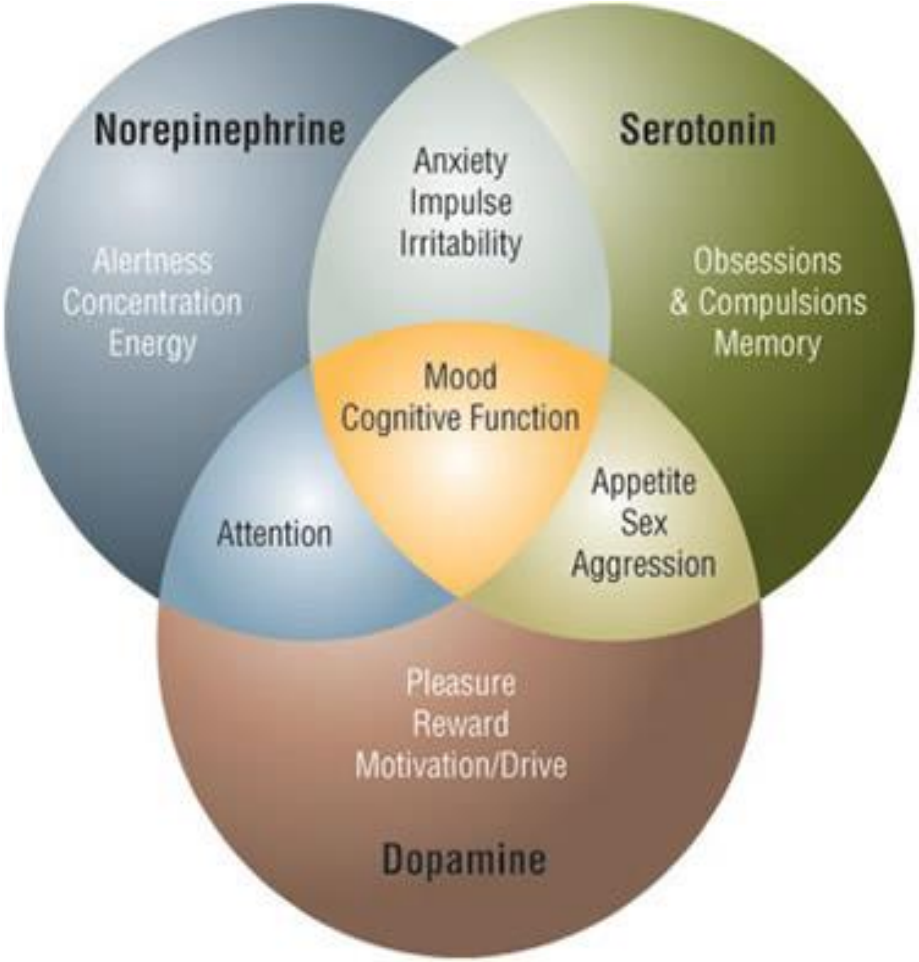
Depression is an *Emotion*

- Depression is a state of low mood and aversion to activity that can affect a person's thoughts, behavior, feelings and sense of well-being.
- People with depressed mood can feel sad, anxious, empty, hopeless, helpless, worthless, guilty, irritable or restless.
- They may lose interest in activities that were once pleasurable

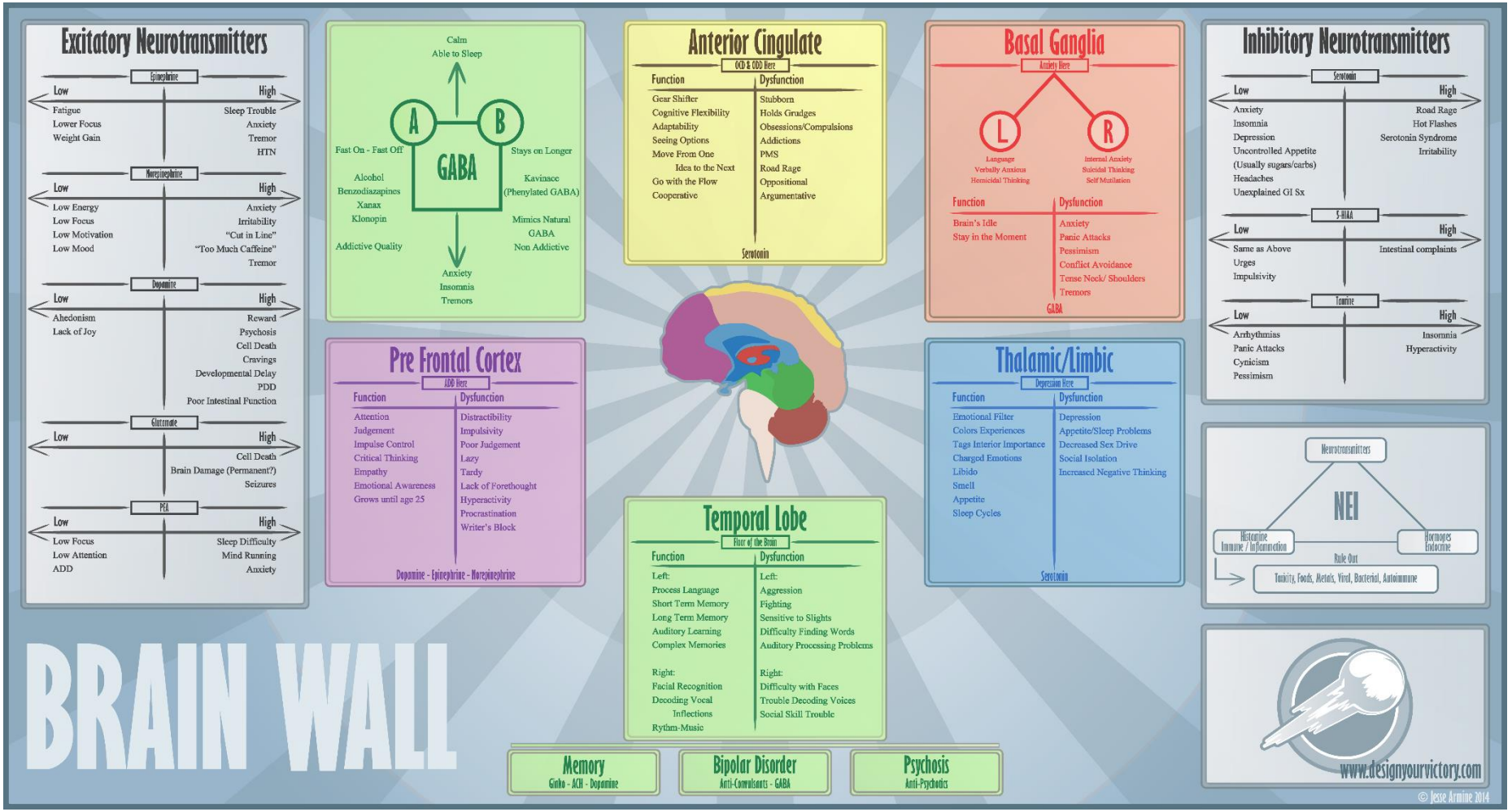
Emotional Trauma

- **(Emotional)Trauma** is an emotional response to a terrible event like an accident, rape or natural disaster.
- Immediately after the event, shock and denial are typical. Longer term reactions include unpredictable emotions, flashbacks, strained relationships and even physical symptoms like headaches or nausea.
- While these feelings are normal, some people have difficulty moving on with their lives.
    - American Psychological Association

Emotions are the ***EXPRESSION*** of the Neurotransmitters in your Brain



Reference: http://choosinghealthnow.com/blog/does-this-neurotransmitter-make-my-butt-look-fat/


Excitatory Neurotransmitters
Epinephrine
Low
Fatigue
Lower Focus
Weight Gain
High
Sleep Trouble
Anxiety
Tremor
HTN
Norepinephrine
Low
Low Energy
Low Focus
Low Motivation
Low Mood
High
Anxiety
Irritability
"Cut in Line"
"Too Much Caffeine"
Tremor
Dopamine
Low
Ahedonism
Lack of Joy
High
Reward
Psychosis
Cell Death
Cravings
Developmental Delay
PDD
Poor Intestinal Function
Glutamate
Low
High
Cell Death
Brain Damage (Permanent?)
Seizures
PEA
Low
Low Focus
Low Attention
ADD
High
Sleep Difficulty
Mind Running
Anxiety
Calm
Able to Sleep
A
B
GABA
Fast On - Fast Off
Alcohol
Benzodiazapines
Xanax
Klonopin
Addictive Quality
Stays on Longer
Kavinsce
(Phenylated GABA)
Mimics Natural
GABA
Non Addictive
Anxiety
Insomnia
Tremors
Anterior Cingulate
OCD & ODD Here
Function
Gear Shifter
Cognitive Flexibility
Adaptability
Seeing Options
Move From One
Idea to the Next
Go with the Flow
Cooperative
Dysfunction
Stubborn
Holds Grudges
Obsessions/Compulsions
Addictions
PMS
Road Rage
Oppositional
Argumentative
Serotonin
Basal Ganglia
Anxiety Here
L
R
Language
Verbally Anxious
Homicidal Thinking
Internal Anxiety
Suicidal Thinking
Self Mutilation
Function
Brain's Idle
Stay in the Moment
Dysfunction
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Panic Attacks
Pessimism
Conflict Avoidance
Tense Neck/ Shoulders
Tremors
GABA
Inhibitory Neurotransmitters
Serotonin
Low
Anxiety
Insomnia
Depression
Uncontrolled Appetite
(Usually sugars/carbs)
Headaches
Unexplained GI Sx
High
Road Rage
Hot Flashes
Serotonin Syndrome
Irritability
5-HIAA
Low
Same as Above
Urges
Impulsivity
High
Intestinal complaints
Tamine
Low
Arrhythmias
Panic Attacks
Cynicism
Pessimism
High
Insomnia
Hyperactivity
Pre Frontal Cortex
ADD Here
Function
Attention
Judgement
Impulse Control
Critical Thinking
Empathy
Emotional Awareness
Grows until age 25
Dysfunction
Distractibility
Impulsivity
Poor Judgement
Lazy
Tardy
Lack of Forethought
Hyperactivity
Procrastination
Writer's Block
Dopamine - Epinephrine - Norepinephrine
Thalamic/Limbic
Depression Here
Function
Emotional Filter
Colors Experiences
Tags Interior Importance
Charged Emotions
Libido
Smell
Appetite
Sleep Cycles
Dysfunction
Depression
Appetite/Sleep Problems
Decreased Sex Drive
Social Isolation
Increased Negative Thinking
Serotonin
Neurotransmitters
NEI
Histamine
Immune / Inflammation
Hormones
Endocrine
Rule Out
Toxicity, Foods, Metals, Viral, Bacterial, Autoimmune
Temporal Lobe
Floor of the Brain
Function
Left:
Process Language
Short Term Memory
Long Term Memory
Auditory Learning
Complex Memories
Right:
Facial Recognition
Decoding Vocal
Inflections
Rythm-Music
Dysfunction
Left:
Aggression
Fighting
Sensitive to Slights
Difficulty Finding Words
Auditory Processing Problems
Right:
Difficulty with Faces
Trouble Decoding Voices
Social Skill Trouble
BRAIN WALL
Memory
Ginko - ACH - Dopamine
Bipolar Disorder
Anti-Convulsants - GABA
Psychosis
Anti-Psychotics
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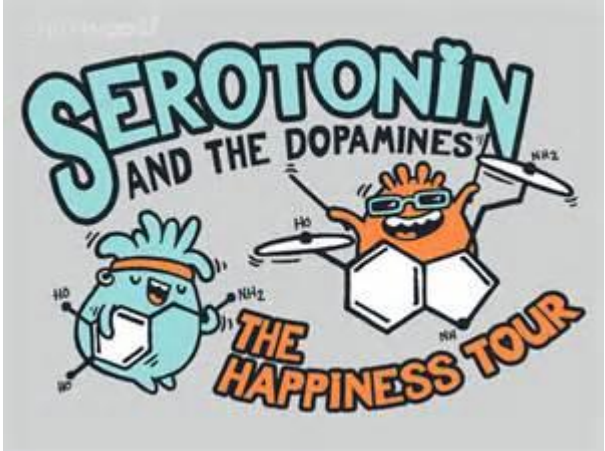
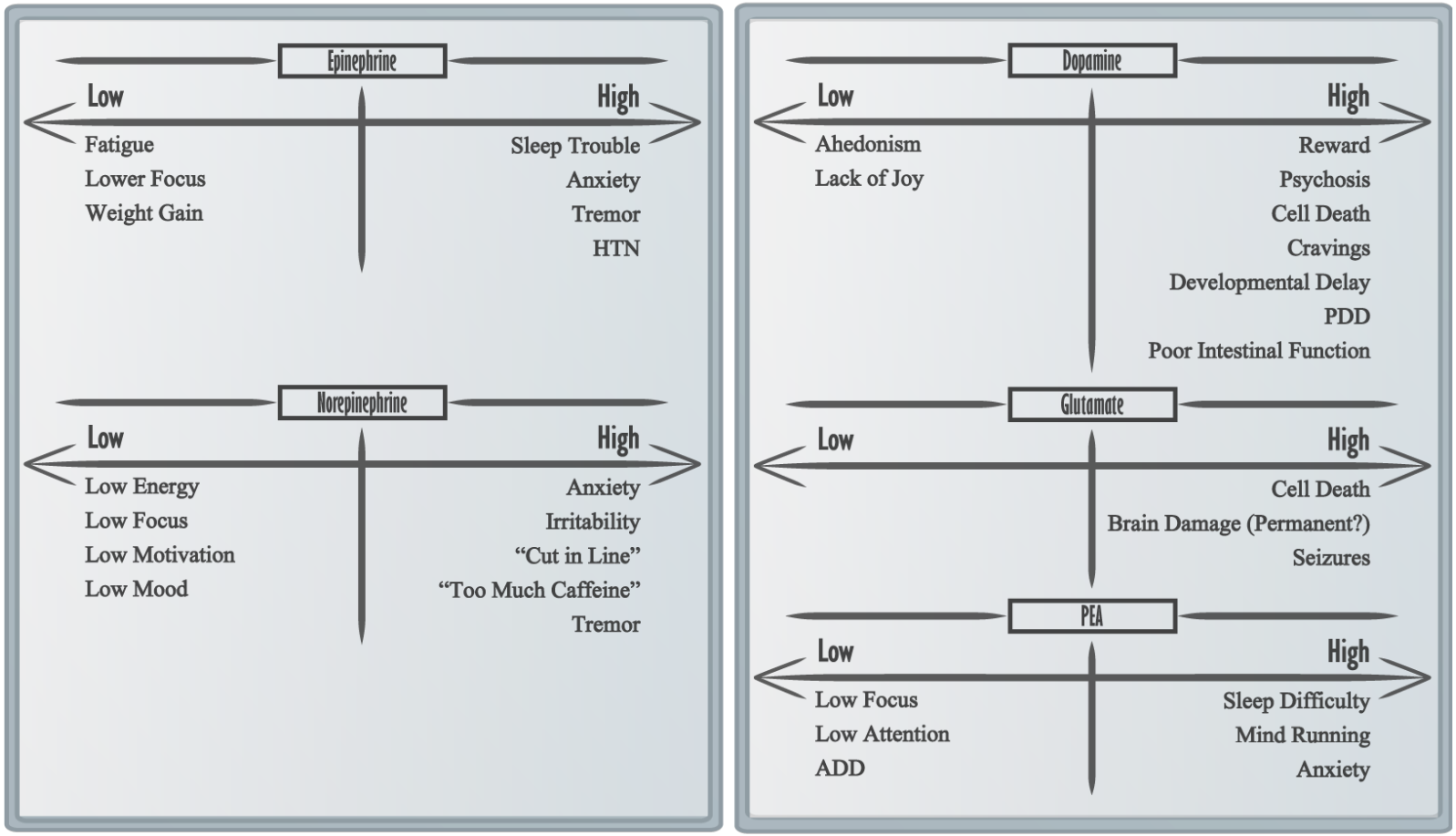
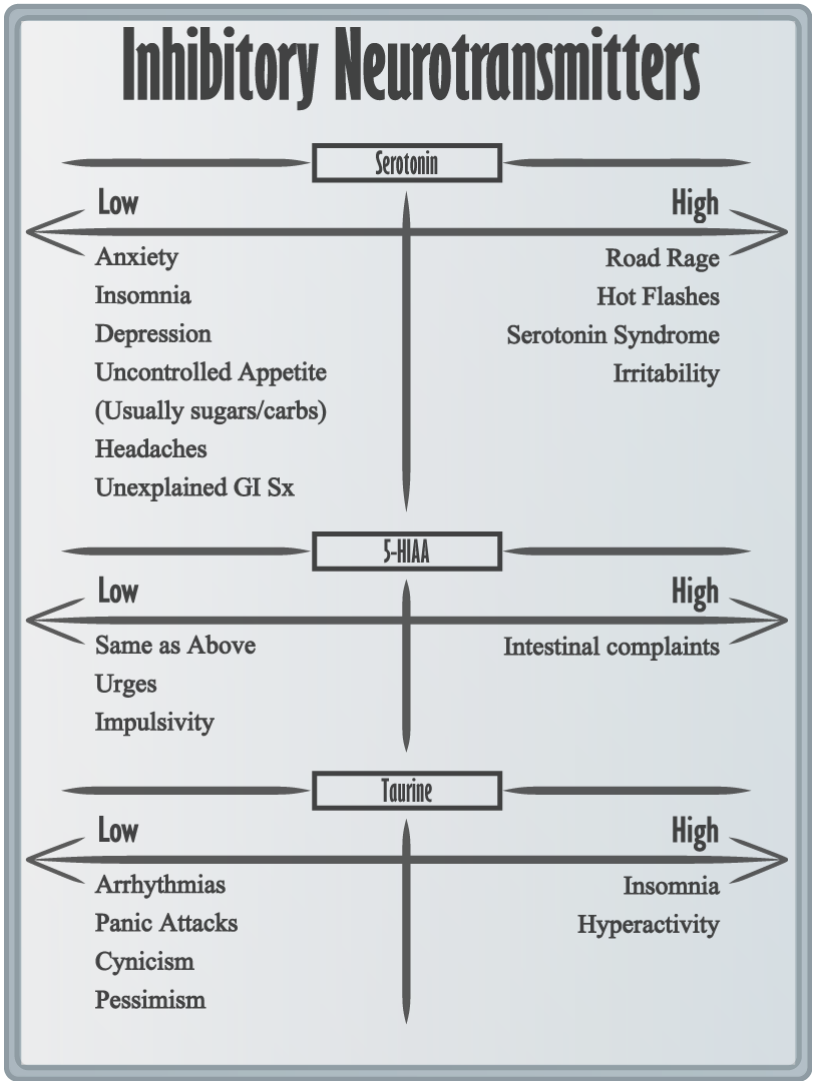


Neurotransmitters and their Functions

Neurotransmitters

Excitatory Neurotransmitters




Inhibitory Neurotransmitters
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(Usually sugars/carbs)
Headaches
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Same as Above
Urges
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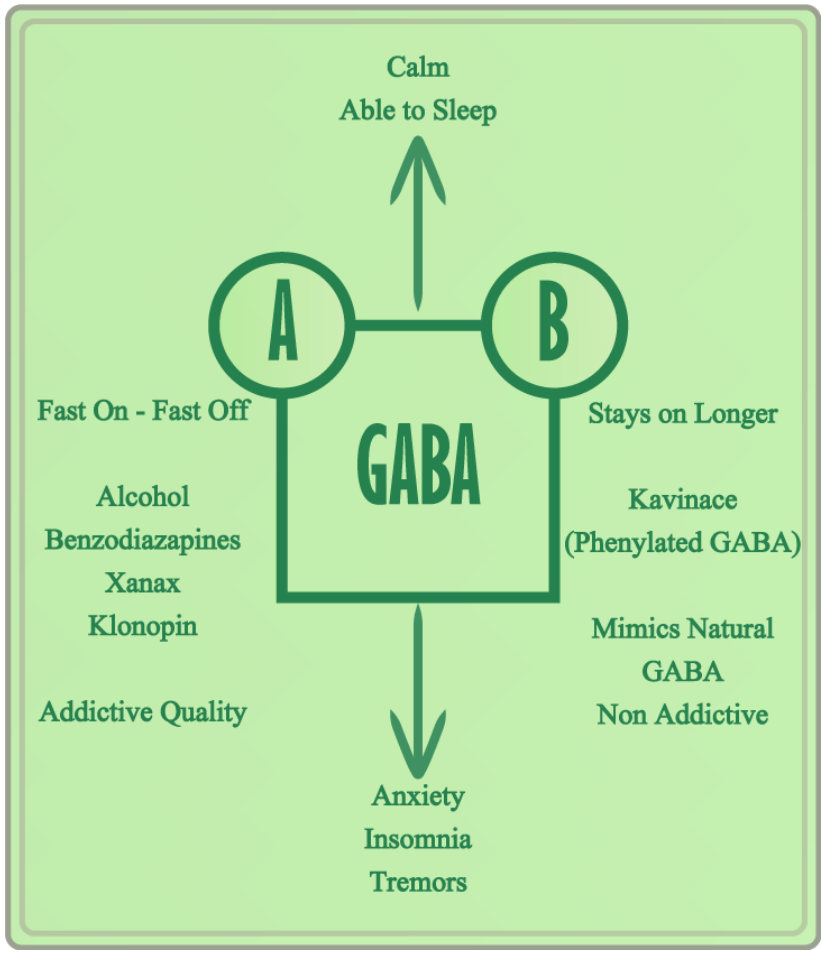
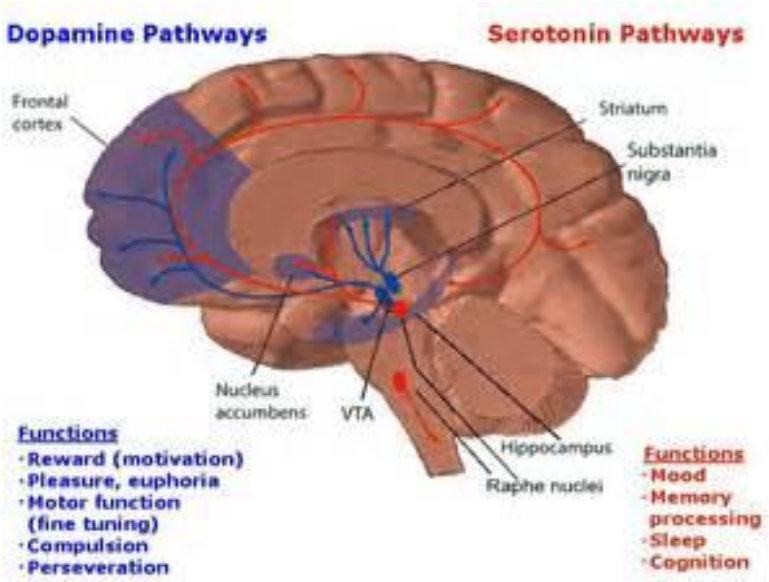
Panic Attacks
Cynicism
Pessimism
High
Insomnia
Hyperactivity

GABA

Gamma Amino Butyric Acid



- Gamma-Aminobutyric acid is the chief inhibitory neurotransmitter in the mammalian central nervous system. http://en.wikipedia.org/wiki/Gamma-Aminobutyric_acid



Their Functions and the Associated Symptoms of Dysfunctions

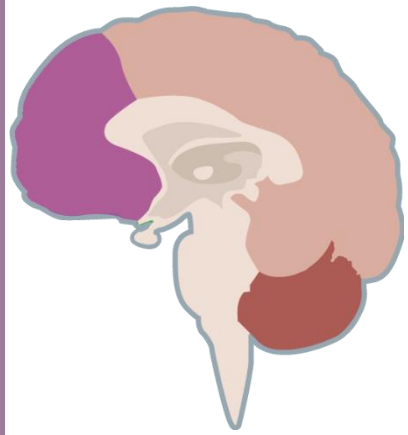
Areas of the Brain

Pre Frontal Cortex

ADD Here

Function	Dysfunction
Attention	Distractibility
Judgement	Impulsivity
Impulse Control	Poor Judgement
Critical Thinking	Lazy
Empathy	Tardy
Emotional Awareness	Lack of Forethought
Grows until age 25	Hyperactivity
	Procrastination
	Writer's Block

Dopamine - Epinephrine - Norepinephrine

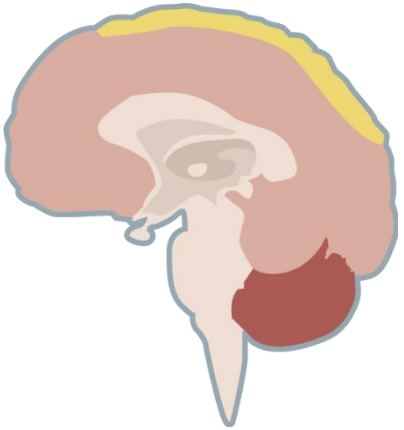


Anterior Cingulate

OCD & ODD Here

Function	Dysfunction
Gear Shifter	Stubborn
Cognitive Flexibility	Holds Grudges
Adaptability	Obsessions/Compulsions
Seeing Options	Addictions
Move From One Idea to the Next	PMS
	Road Rage
Go with the Flow	Oppositional
Cooperative	Argumentative

Serotonin



Basal Ganglia

Anxiety Here

L

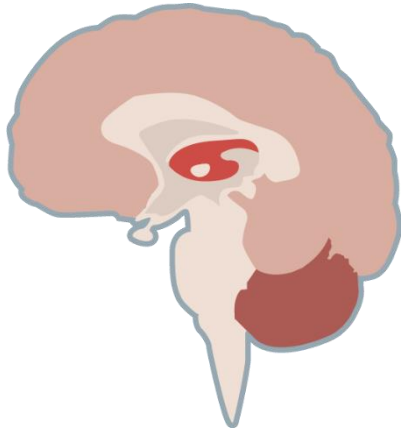
Language
Verbally Anxious
Homicidal Thinking

R

Internal Anxiety
Suicidal Thinking
Self Mutilation

Function	Dysfunction
Brain's Idle	Anxiety
Stay in the Moment	Panic Attacks
	Pessimism
	Conflict Avoidance
	Tense Neck/ Shoulders
	Tremors

GABA

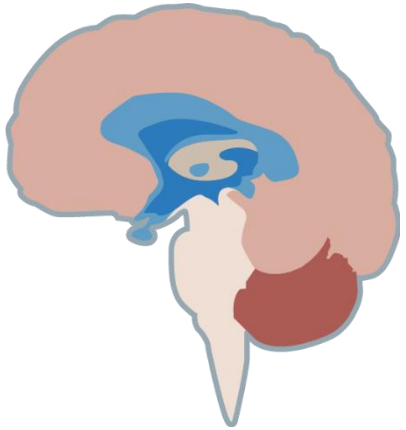


Thalamic/Limbic

Depression Here

Function	Dysfunction
Emotional Filter	Depression
Colors Experiences	Appetite/Sleep Problems
Tags Interior Importance	Decreased Sex Drive
Charged Emotions	Social Isolation
Libido	Increased Negative Thinking
Smell	
Appetite	
Sleep Cycles	

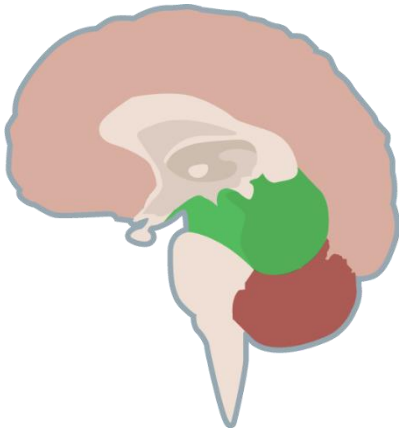
Serotonin



Temporal Lobe

Floor of the Brain

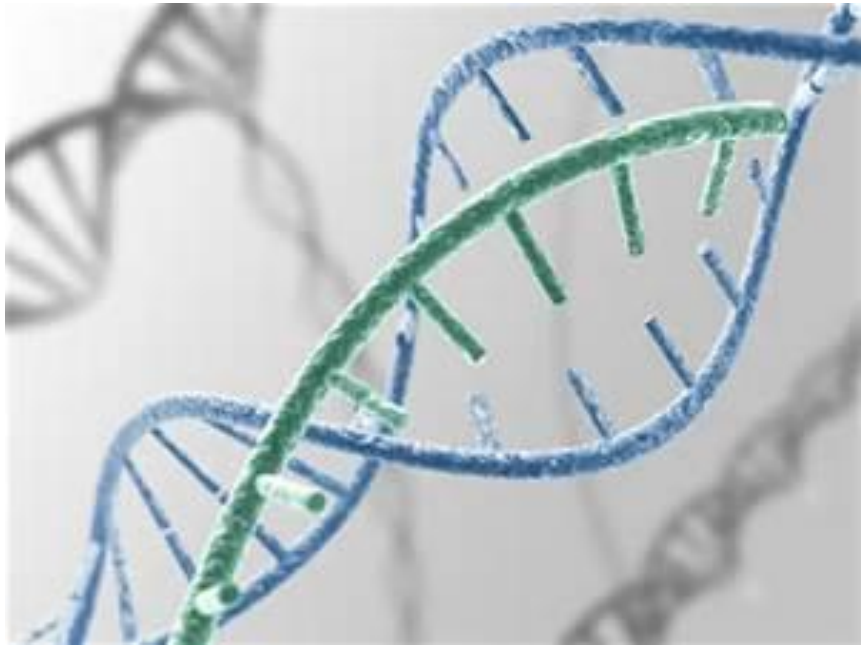
Function	Dysfunction
Left:	Left:
Process Language	Aggression
Short Term Memory	Fighting
Long Term Memory	Sensitive to Slights
Auditory Learning	Difficulty Finding Words
Complex Memories	Auditory Processing Problems
Right:	Right:
Facial Recognition	Difficulty with Faces
Decoding Vocal Inflections	Trouble Decoding Voices
Rythm-Music	Social Skill Trouble



Memory
Ginko - ACH - Dopamine

Bipolar Disorder
Anti-Convulsants - GABA

Psychosis
Anti-Psychotics



Genetic snps

Are There Genetic Predispositions?

Acknowledgement

I want to thank Dr. Ben Lynch for allowing me to use many of his Pathway Planners in this lecture.

Benjamin Lynch, ND
Pioneer, Innovator, Researcher,
Clinician, Helluva Nice Guy!

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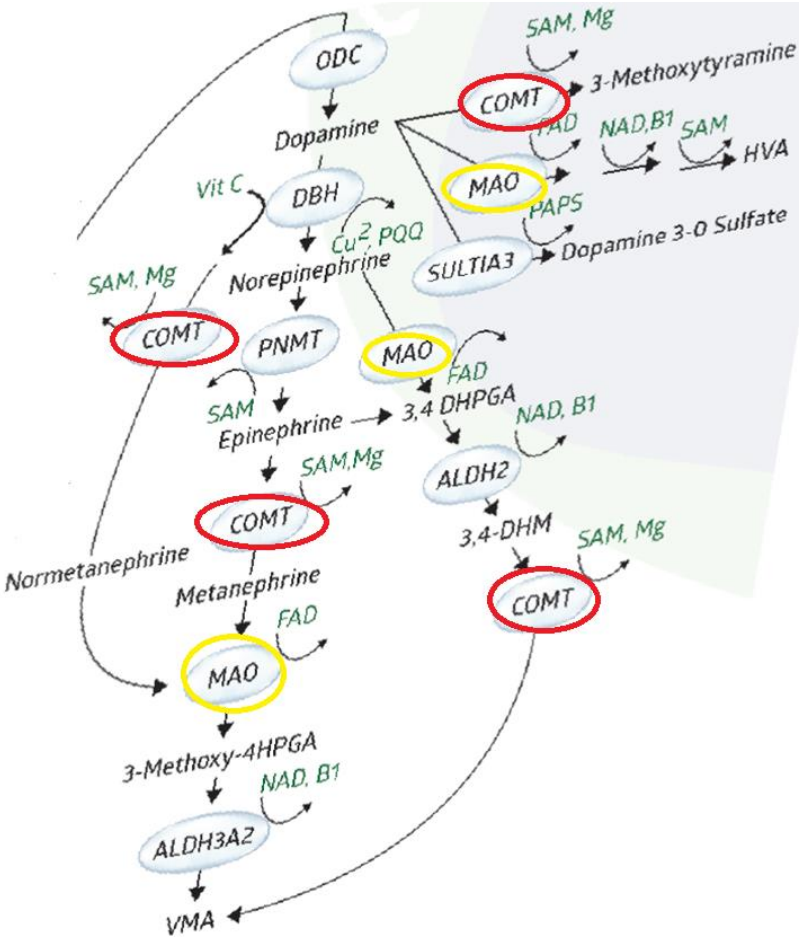
EXCITATION CAN CAUSE THESE SYMPTOMS, WHICH SNPS ARE IMPORTANT TO CONSIDER?

COMT, MAO



COMT	rs6269	G	AA	-/-
COMT -61 P199P	rs769224	A	AG	+/-
COMT H62H	rs4633	T	TT	+/+
MAO A R297R	rs6323	T	GT	+/-

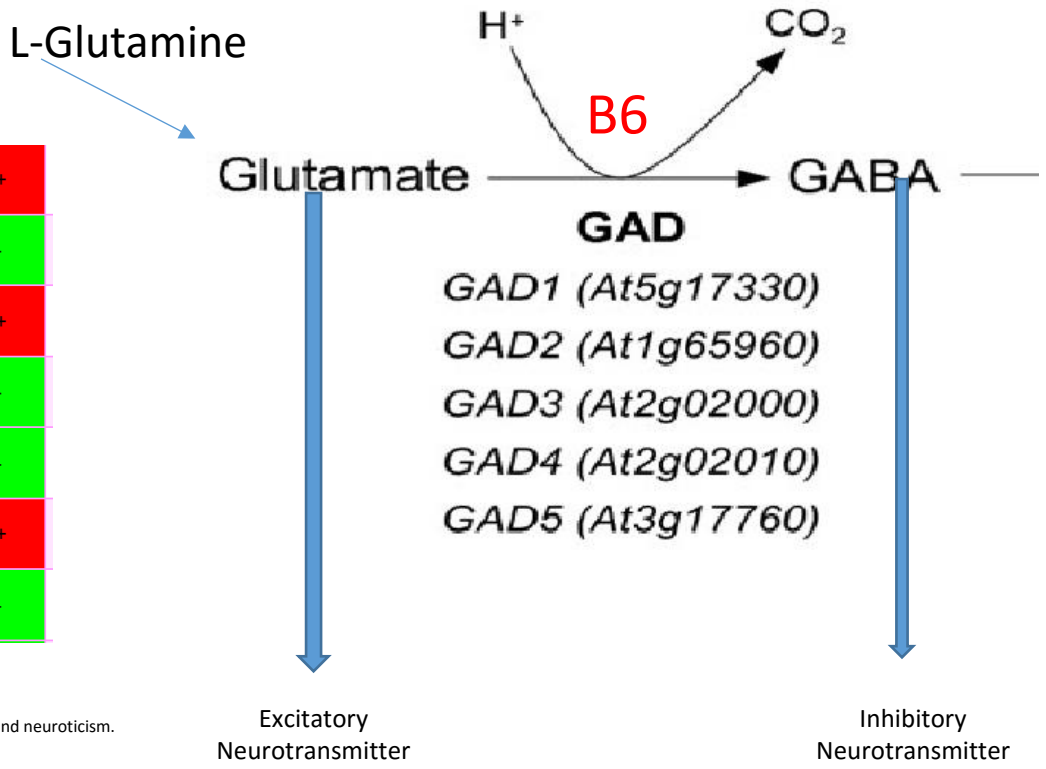
SNPS slow down the metabolism (drainage) of catecholamines and eventually, they will "overflow"

Papaleo, Francesco et al. "Genetic Dissection of the Role of Catechol-O-Methyltransferase in Cognition and Stress Reactivity in Mice." The Journal of neuroscience : the official journal of the Society for Neuroscience 28.35 (2008): 8709–8723. PMC. Web. 30 July 2015.

Simpson, Eleanor H. et al. "Genetic Variation in COMT Activity Impacts Learning and Dopamine Release Capacity in the Striatum." Learning & Memory 21.4 (2014): 205–214. PMC. Web. 30 July 2015.

INCREASED GLUTAMATE CAN CAUSE EXCITATION
What SNPs can cause that?
GAD

GAD1	rs2058725	C	CC	+/+
GAD1	rs3791851	C	TT	-/-
GAD1	rs3791850	A	AA	+/+
GAD1	rs12185692	A	CC	-/-
GAD1	rs3791878	T	GG	-/-
GAD1	rs10432420	A	AA	+/+
GAD1	rs3828275	T	CC	-/-



Association between glutamic acid decarboxylase genes and anxiety disorders, major depression, and neuroticism.
Mol Psychiatry. 2006 Aug;11(8):752-62. Epub 2006 May 23.
Hettema JM1, An SS, Neale MC, Bukszar J, van den Oord EJ, Kendler KS, Chen X.

ROS, Aldehydes (Yeast)

SOD2	rs2758331	A	AC	+/-
SOD2	rs2855262	T	CT	+/-
SOD2 A16V	rs4880	G	AG	+/-
PON1 Q192R	rs662	C	CT	+/-

SOD suspect mitochondrial involvement. Involved in MCS

PON1 Organophosphates (Patient lives in a farming community)

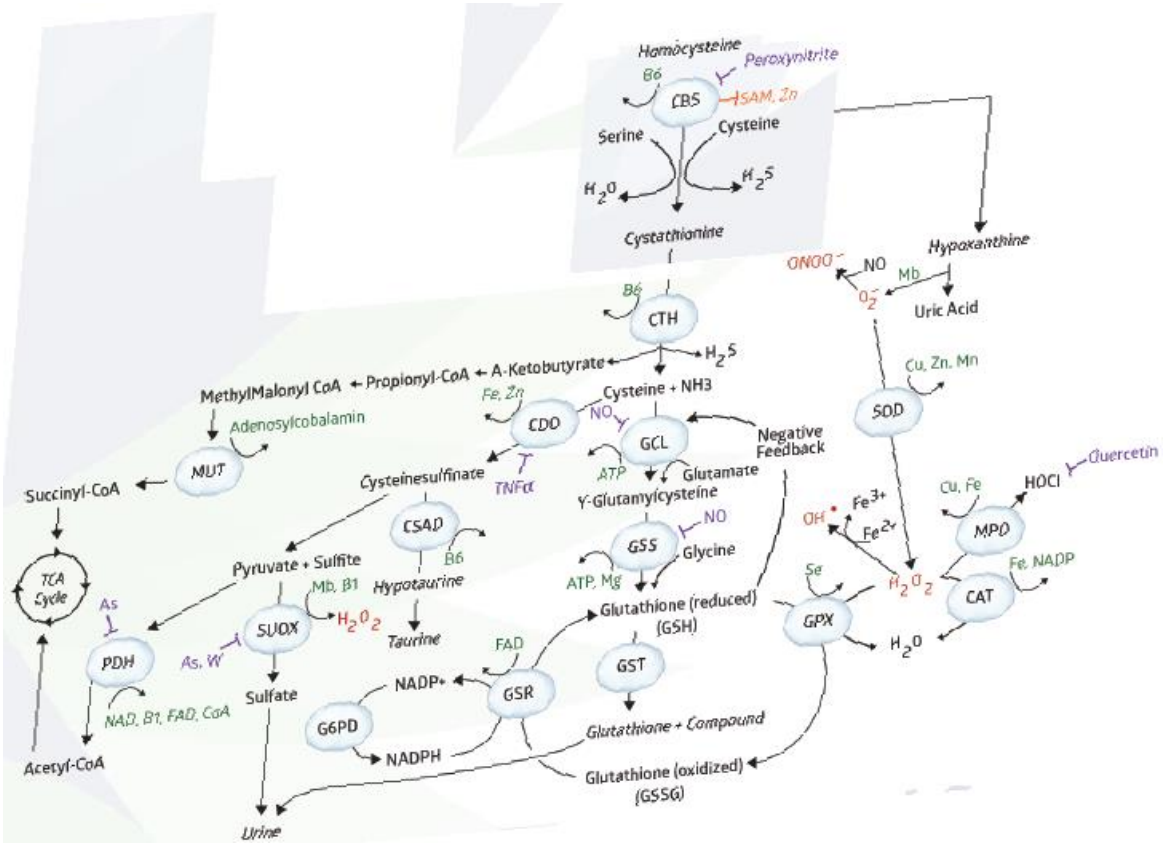
Suspect difficulty in metabolizing aldehydes.
Also involved in MCS

NAT2 A803G (K268R)	rs1208	G	AG	+/-
NAT2 C190T (R64W)	rs1805158	T	CC	-/-
NAT2 G590A (R197Q)	rs1799930	A	AG	+/-
NAT2 G857A (G286E)	rs1799931	A	GG	-/-
NAT2 T341C (I114T)	rs1801280	C	CT	+/-

Cui, Xiaoyi et al. "Evaluation of Genetic Polymorphisms in Patients with Multiple Chemical Sensitivity." Ed. Aditya Bhushan Pant. PLoS ONE 8.8 (2013): e73708. PMC. Web. 30 July 2015.

TransSulfuration

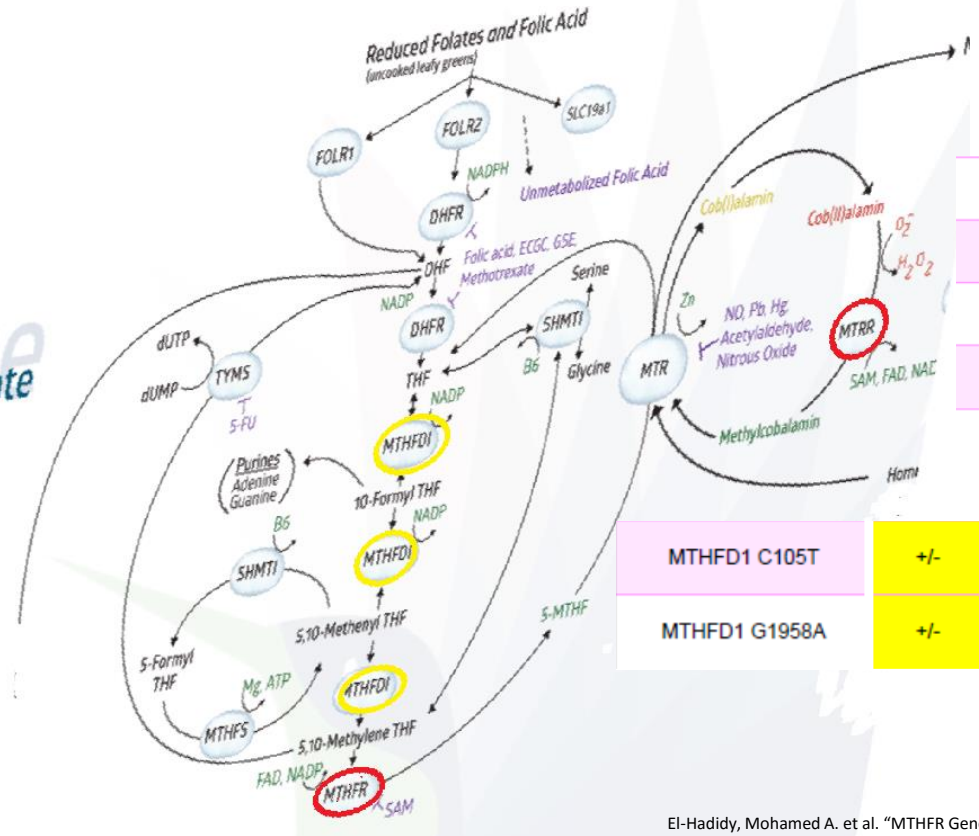
CBS A13637G	+/-
CBS A360A	+/-
CBS C19150T	-/-
CBS C699T	-/-
CBS N212N	-/-



When it does express you may see brain fog, high ammonia on lab tests and/or high taurine on NT testing.

METHYLATION

MTHFR 03 P39P	+/-
MTHFR A1298C	+/-
MTHFR A1572G	+/-
MTHFR C677T	+/-
MTHFR G1793A (R594Q)	+/-
MTHFR	+/-
MTHFR	-/-
MTHFR	+/-
MTHFR	+/-
MTHFR	+/-
MTHFR	+/-
MTHFR	-/-
MTHFR	-/-



MTRR R415T	-/-
MTRR-11 A664A	+/+
MTRR	-/-
MTRR	+/+

MTHFD1 C105T	+/-
MTHFD1 G1958A	+/-

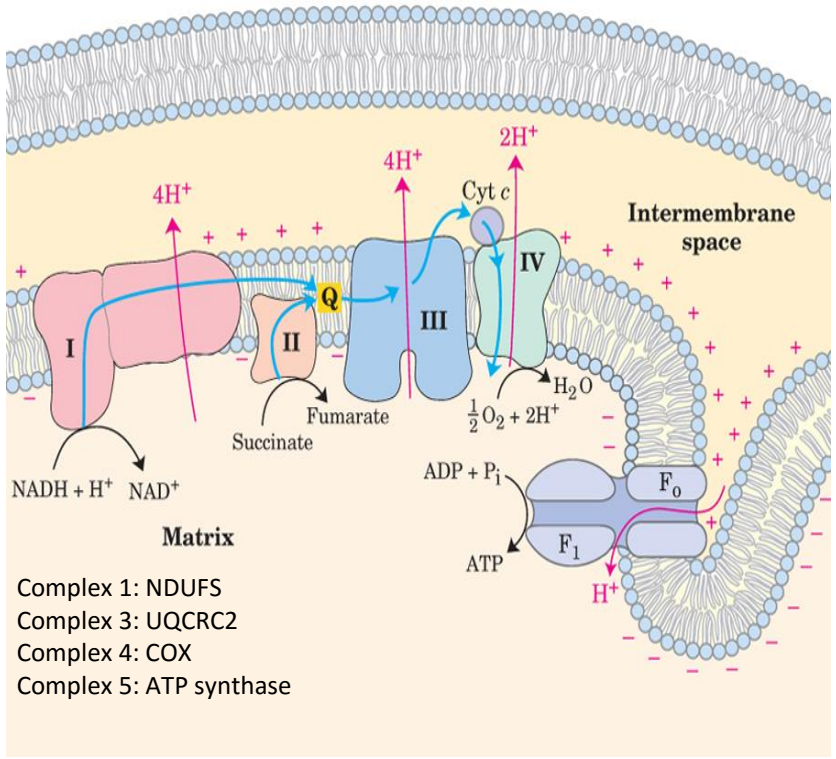
MTHFD1 gastrointestinal health http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3047240/
MTHFR ulcerative colitis http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1774509/

El-Hadidy, Mohamed A. et al. "MTHFR Gene Polymorphism and Age of Onset of Schizophrenia and Bipolar Disorder." BioMed Research International 2014 (2014): 318483. PMC. Web. 30 July 2015.

Neurosci Biobehav Rev. 2013 Sep;37(8):1597-610. doi: 10.1016/j.neubiorev.2013.06.006. Epub 2013 Jun 18. The role of COMT gene variants in depression: Bridging neuropsychological, behavioral and clinical phenotypes. Antypa N1, Drago A, Serretti A.

Mitochondrial Complex 1-The Most Important

NDUFS7	rs2332496	A	AG	+/-
NDUFS7	rs7254913	G	AA	-/-
NDUFS7	rs1142530	T	TT	+/+
NDUFS7	rs7258846	T	TT	+/+
NDUFS7	rs11666067	A	AA	+/+
NDUFS7	rs2074895	A	AA	+/+
NDUFS7	rs809359	G	AA	-/-
NDUFS8	rs4147776	C	AA	-/-
NDUFS8	rs1122731	A	AG	+/-
NDUFS8	rs999571	A	AG	+/-
NDUFS8	rs2075626	C	CT	+/-
NDUFS8	rs3115546	G	TT	-/-
NDUFS8	rs1104739	C	AC	+/-
NDUFS8	rs1051806	T	CT	+/-



Complex 1: NDUFS
Complex 3: UQCRC2
Complex 4: COX
Complex 5: ATP synthase

NADH-ubiquinone oxidoreductase (NDUFS) - GSSG will block the entry of the electron donors into the electron transport chain

What Can Alter Our Neurotransmitters?

- Those Things that Damage the Cell:

Chemical /Physical

- Heavy Metals
- BPA, Benzene
- Heat, Salt
- Shock, Radiation
- Trauma

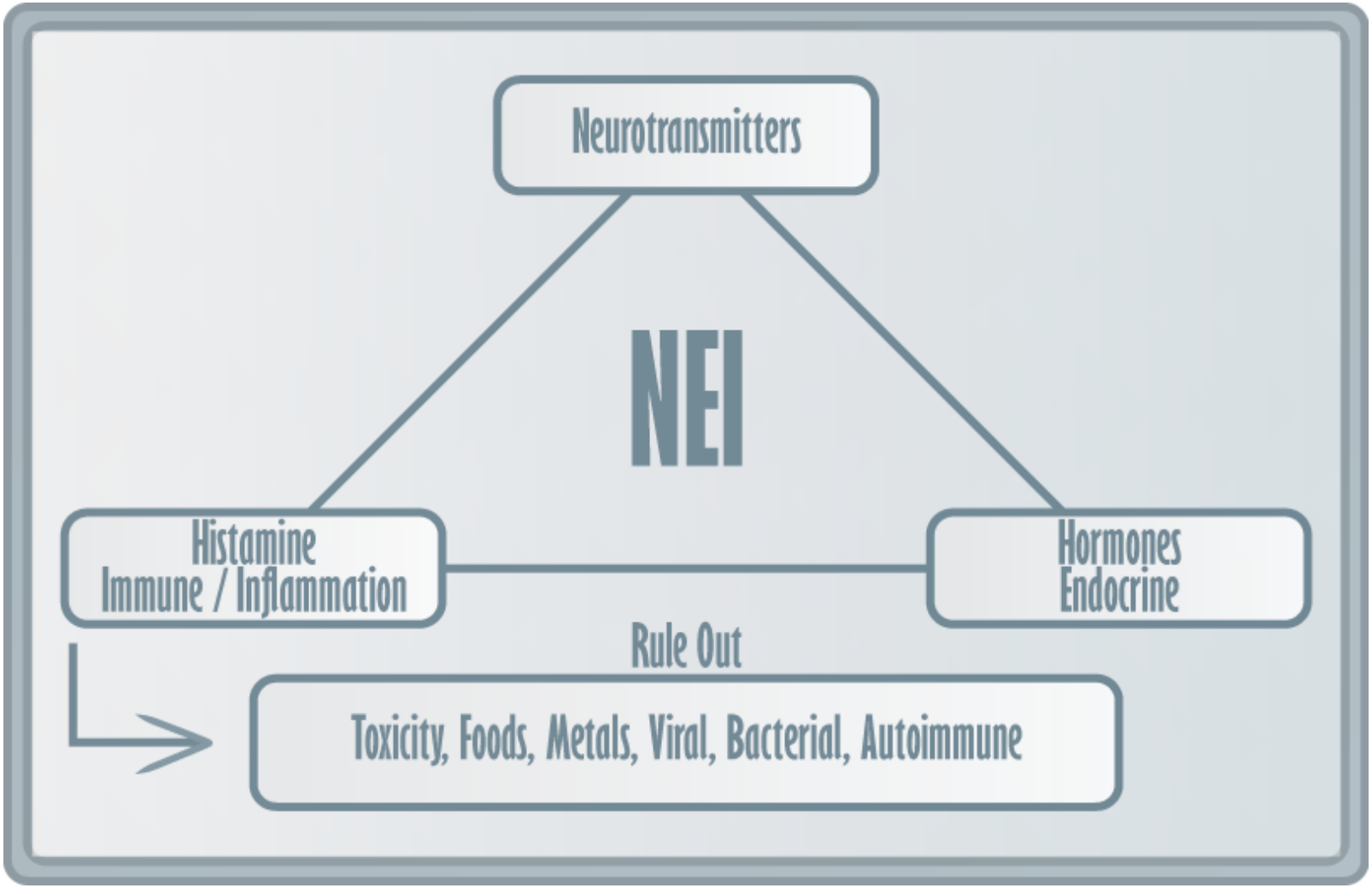
Microbial

- Mold, Fungi
- Bacteria, Parasites

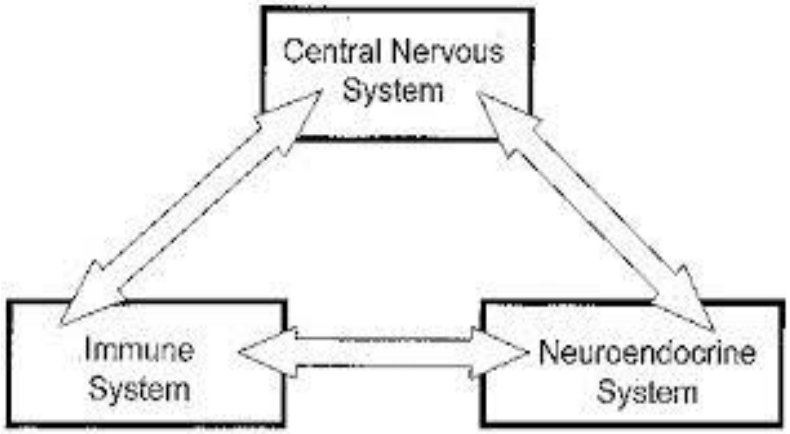
Psychological

- Yelling, abuse
- Isolation, abandonment
- PTSD

Naviaux, R.K., Metabolic features of the cell danger response, Mitochondrion (2013), http://dx.doi.org/10.1016/j.mito.2013.08.006

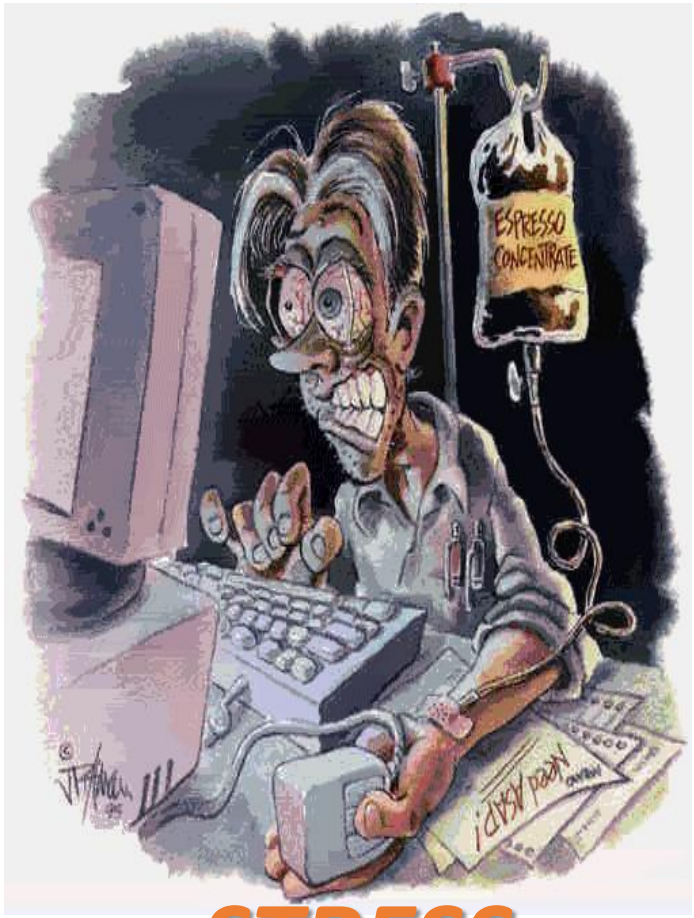

Neurotransmitters
NEI
Histamine
Immune / Inflammation
Hormones
Endocrine
Rule Out
Toxicity, Foods, Metals, Viral, Bacterial, Autoimmune

Causes of Distress and Imbalances

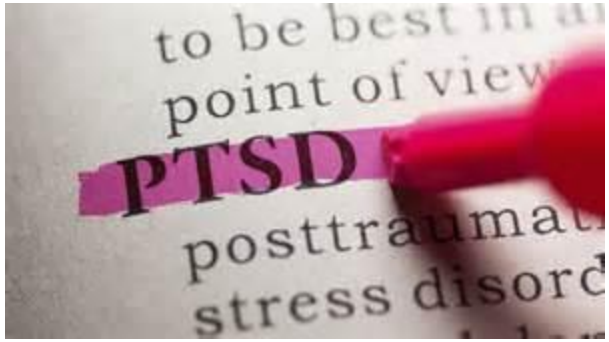


Immune

- Toxins
- Xenobiotics
- Dietary peptides
- Dysbiosis
- Bacterial
- Viral
- Fungal
- Parasites



STRESS



Emotional Trauma

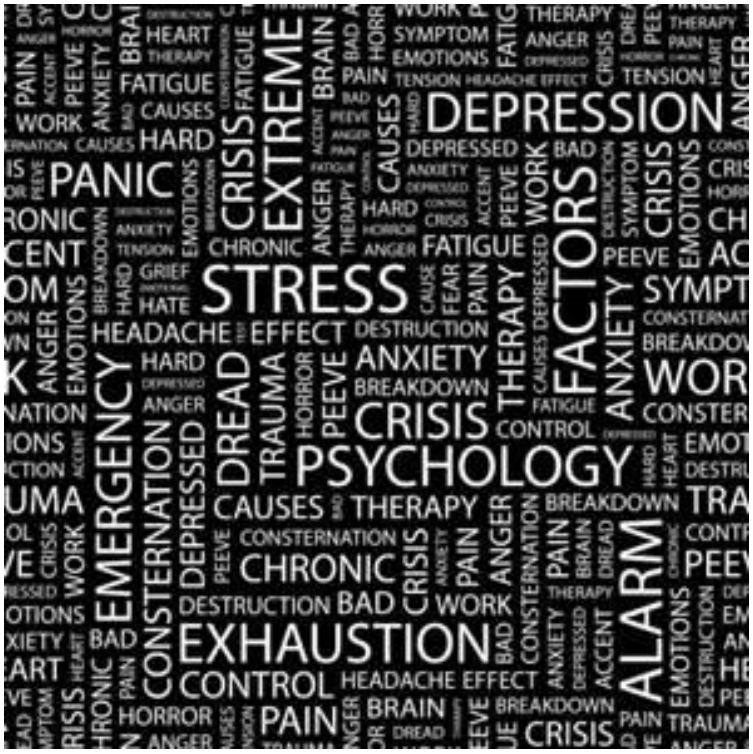
JUST as important as microbial and physical trauma.

An event will most likely lead to emotional or psychological trauma if:

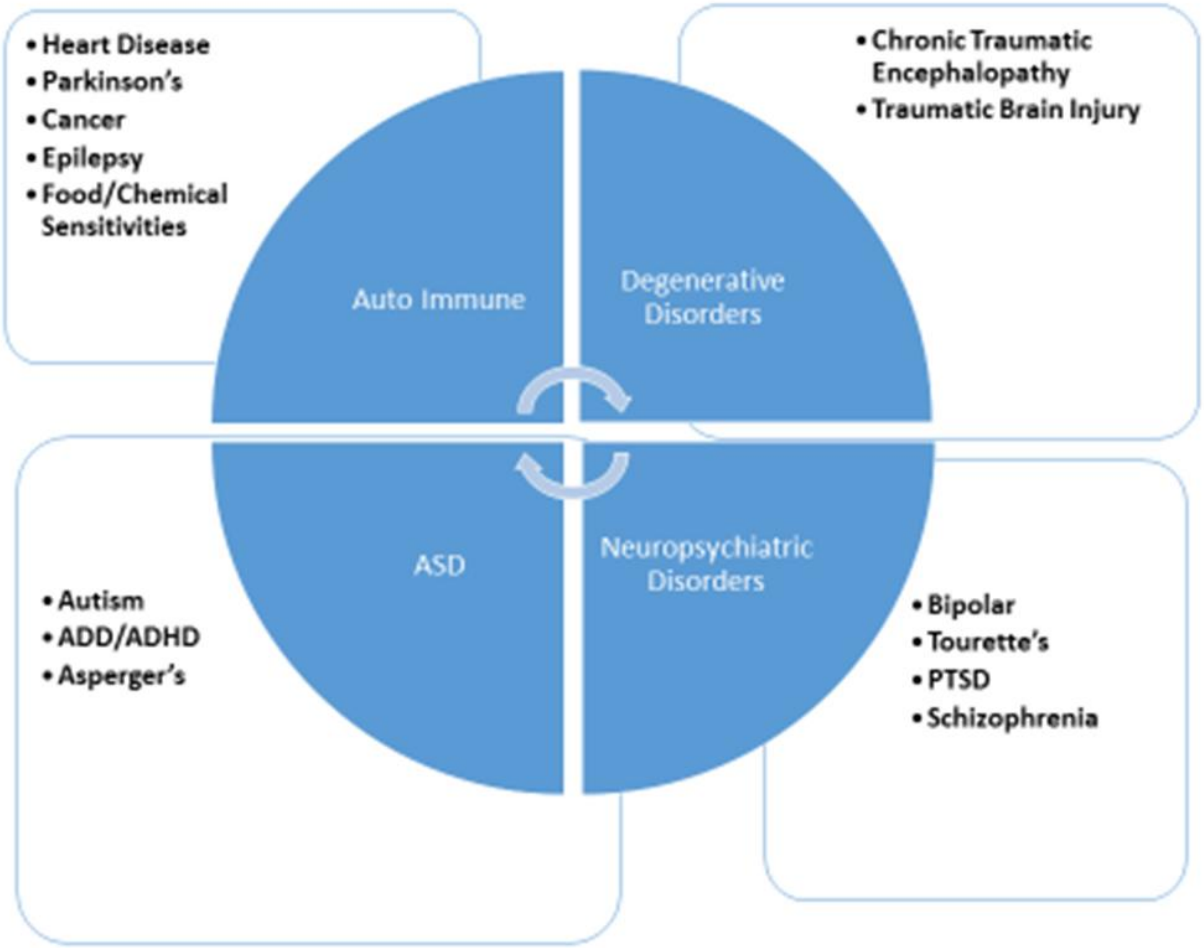
- It happened unexpectedly.
- You were unprepared for it.
- You felt powerless to prevent it.
- It happened repeatedly.
- Someone was intentionally cruel.
- It happened in childhood.

Commonly Overlooked Causes of Emotional Trauma

- Falls or sports injuries
- Surgery (especially in the first 3 years of life)
- The sudden death of someone close
- A car accident
- The breakup of a significant relationship
- A humiliating or deeply disappointing experience
- The discovery of a life-threatening illness or disabling condition



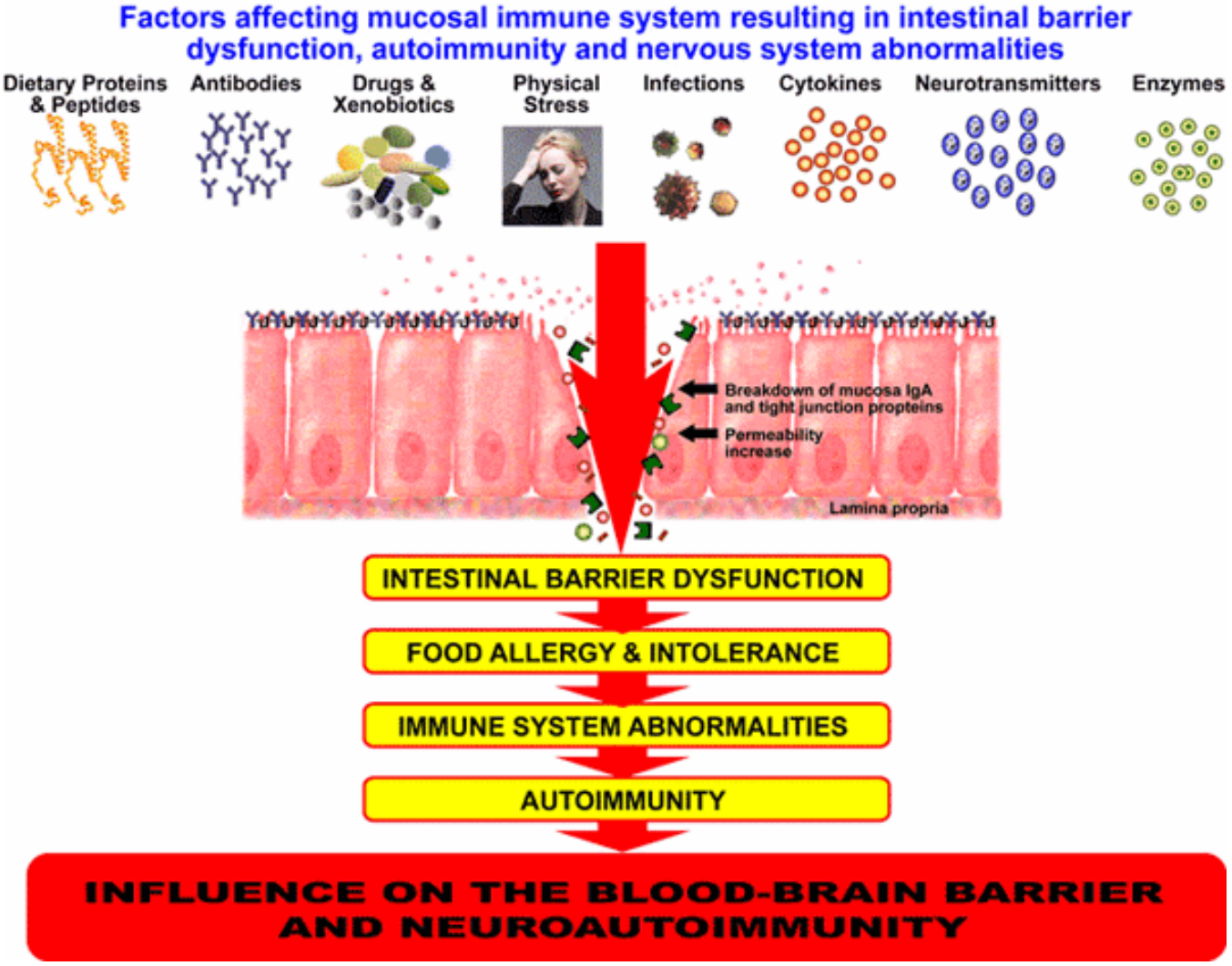
What will these cellular assaults cause?



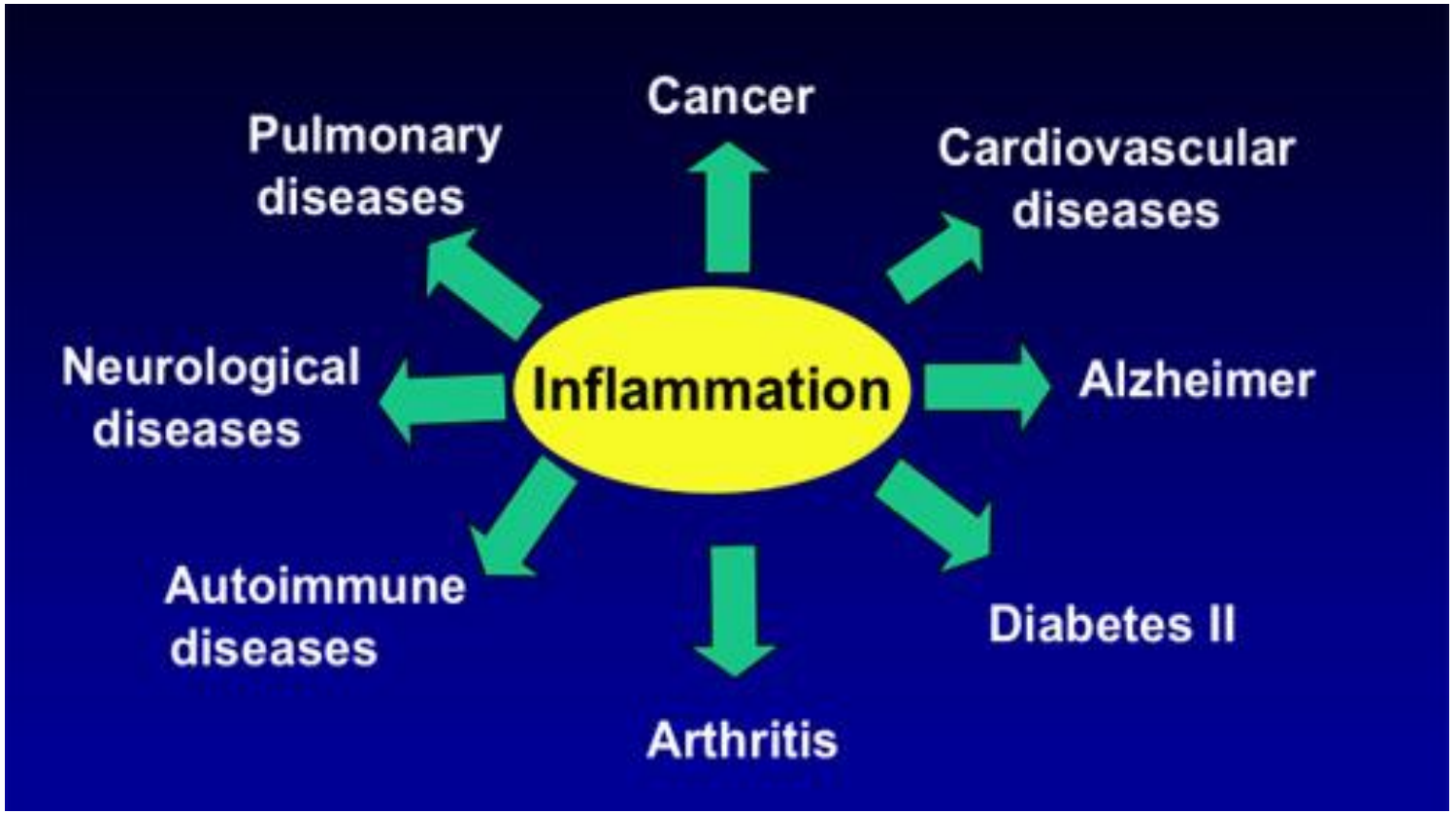
Of assault

The Method

Leaky Gut Creates Inflammation



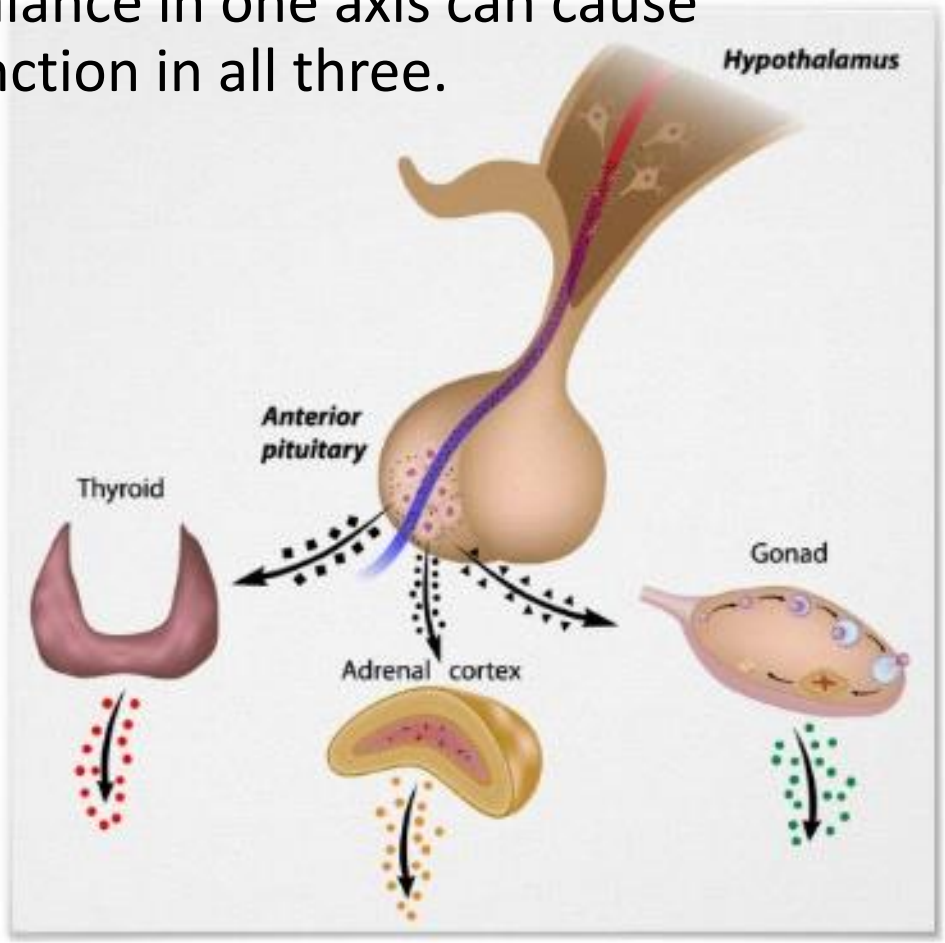
What can Inflammation do to us?



http://www.formulacrossfit.com/inflammatory-remarks-on-the-inflammatory-process/

HPA/HPT/HPG Axis

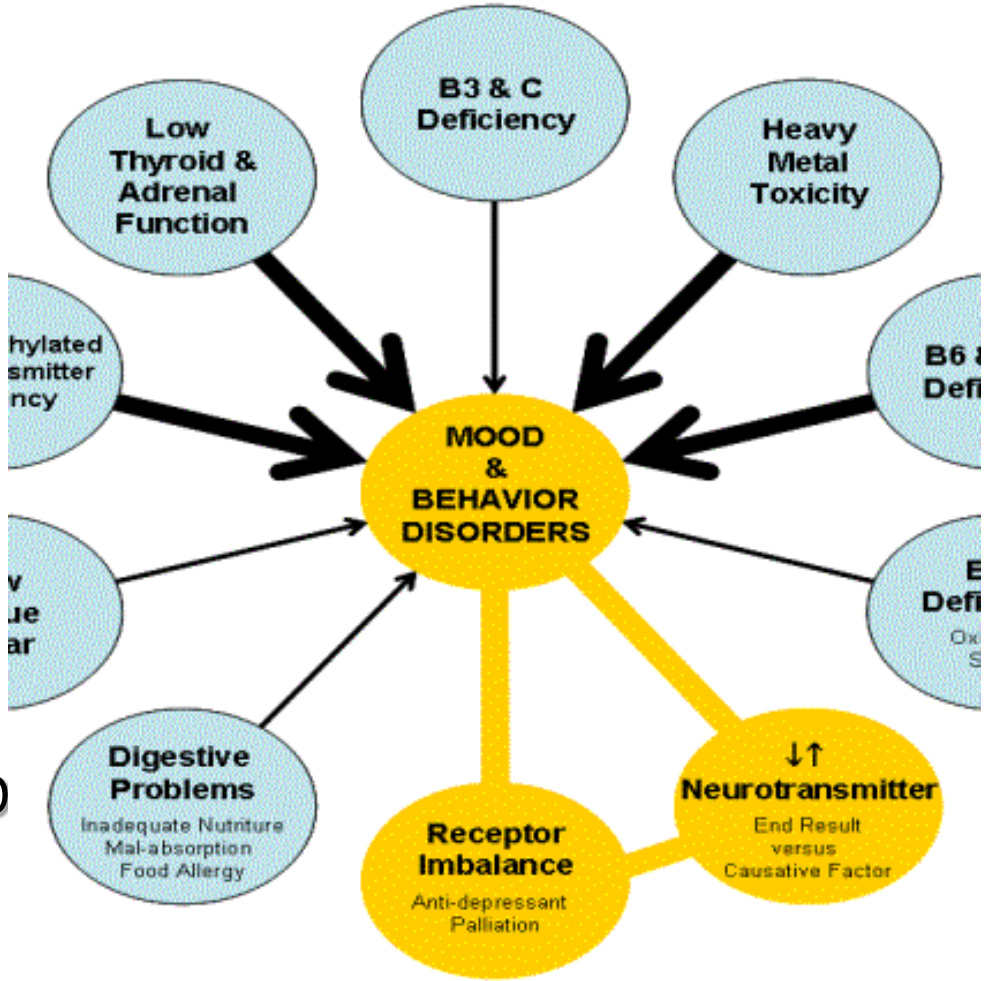
Distress or imbalance in one axis can cause dysfunction in all three.



http://rlv.zcache.com/the_hypothalamic_pituitary_axes_poster

How are they identified?

Mood Diso

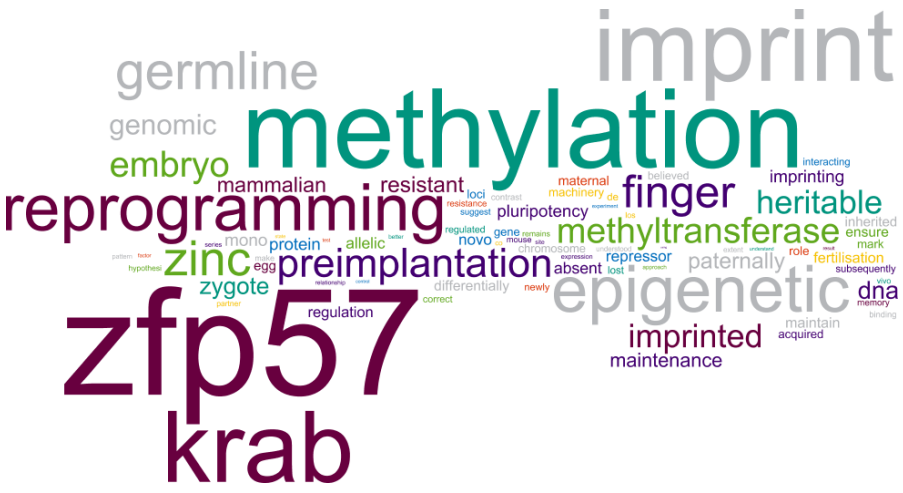


"Listen to your patient, he is telling you the diagnosis"

Sir William Osler, Bt

Founder Father of Johns Hopkins Medical Center*

*Tuteur, Amy (November 19, 2008). "Listen to your patient". The Skeptical OB. Retrieved April 9, 2012.



REMEMBER, In Real Estate, It's "Location, Location, Location."

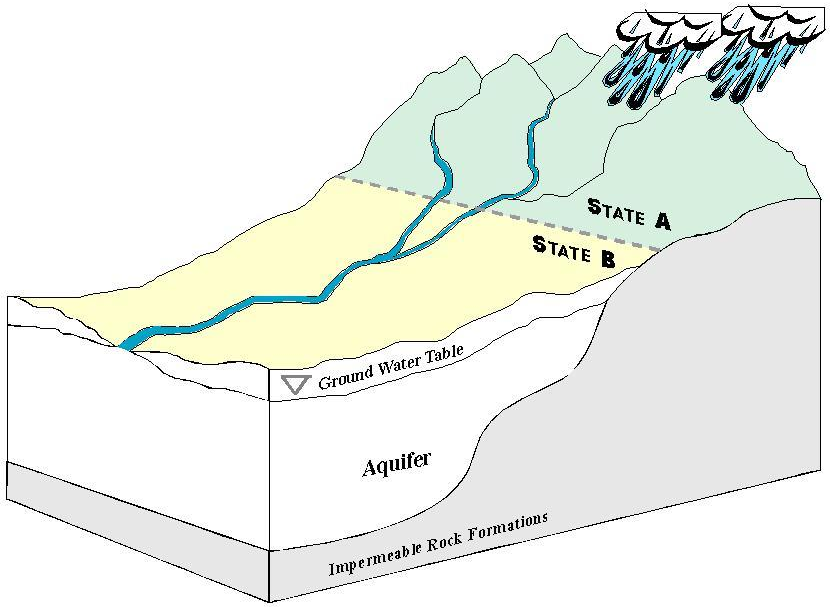
In Health Care it's, "History, History, History!"

The root causes

Look for

- Neurotransmitter and stress hormone testing to identify the level of adrenal stress
- Looking at gut function for Leaky Gut Syndrome, food allergies, candida, dysbiosis, etc…
- Looking for immune dysfunction from possible metal allergies, chronic viral, bacterial, fungal or auto-immune disease.
- **Most of all, root cause analysis requires someone who can….**

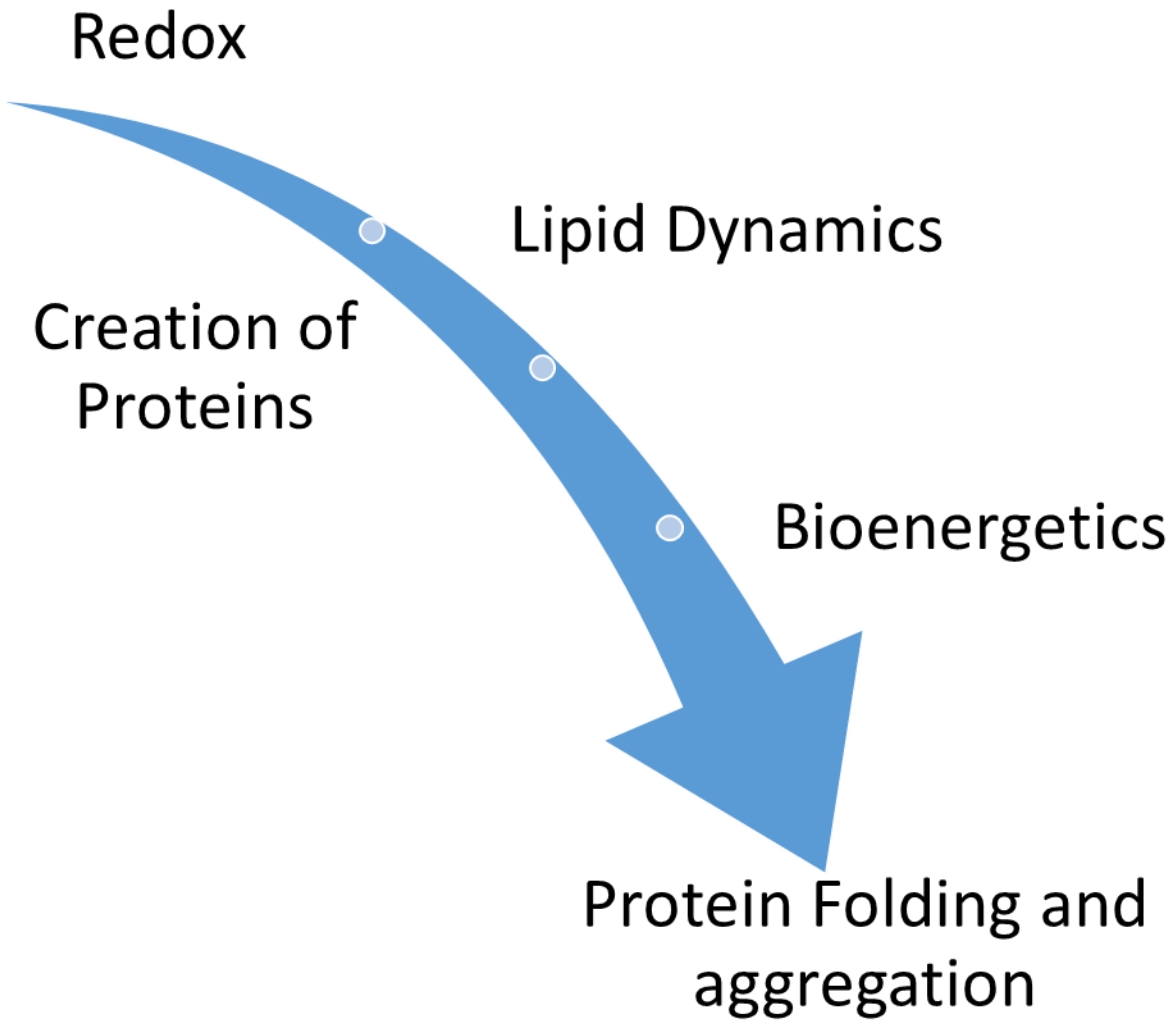
Think Like a Detective



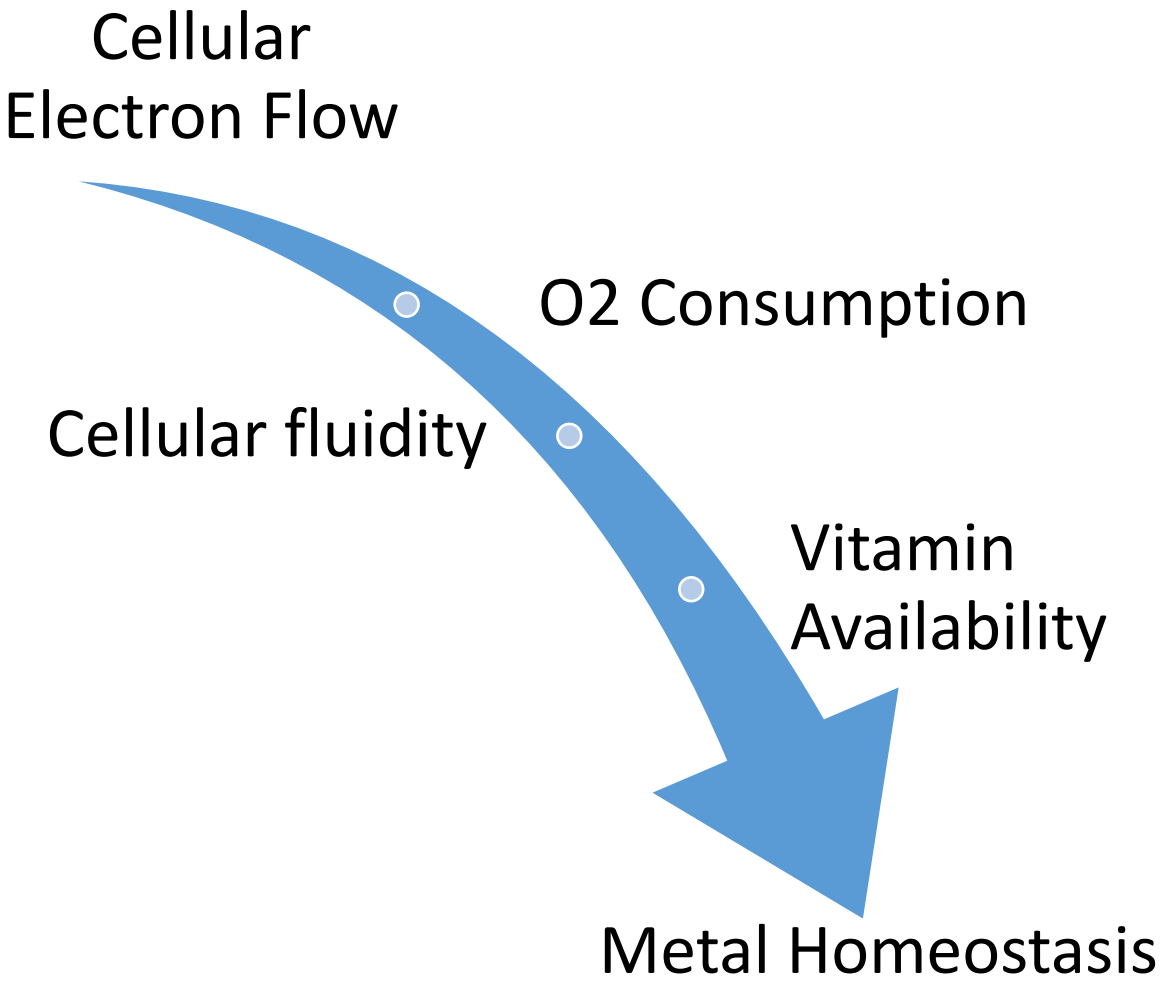
The downstream effects

Look For

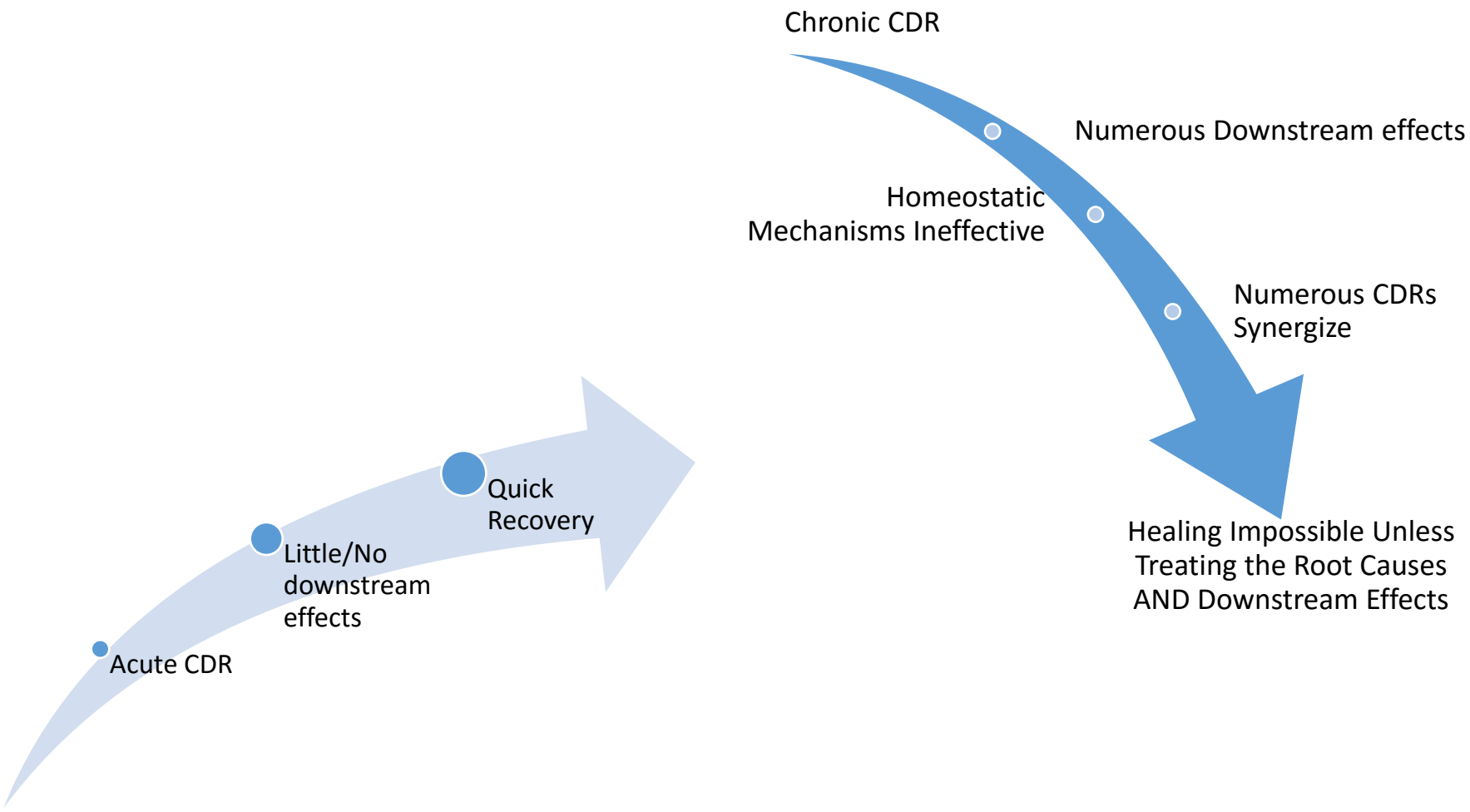
…changes in


Redox
Lipid Dynamics
Creation of Proteins
Bioenergetics
Protein Folding and aggregation

Cell Damage=changes in:



Acute Conditions cannot be treated like Chronic Conditions



If We Treat Symptoms:

Primary Complaints of Depression & Anxiety

The Traditional Medical Route:

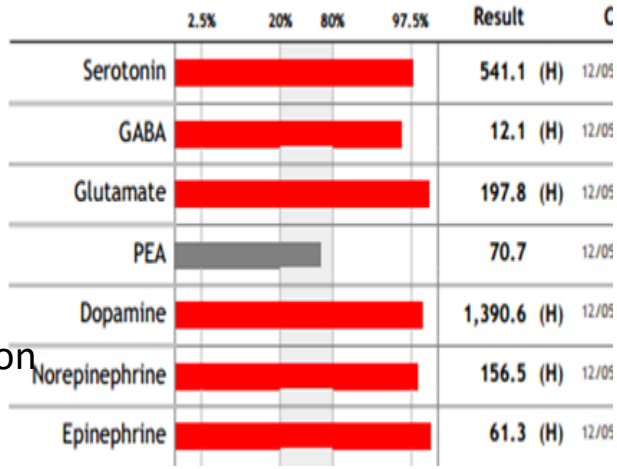
- Antidepressant Medications like Prozac, Zoloft, Lexapro (SSRI)
- If that doesn't work after 4-6 weeks. Then, maybe, Wellbutrin (SNRI, SDRI)
- If that doesn't work after several weeks, then maybe one of the newer meds like Pristiq or maybe referral to a psychiatrist for even stronger meds.
- Let's not forget the Ativan for the anxiety
- None of this gets at the CAUSE

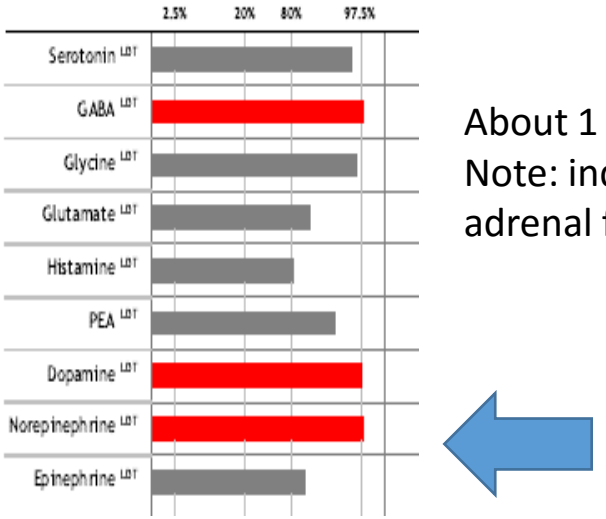
Neurotransmitters Microbial Testing & More

Testing Options

Initial Immune Pattern.

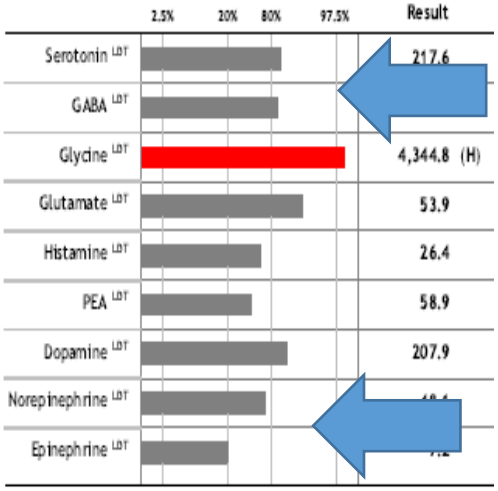
Global Excitation



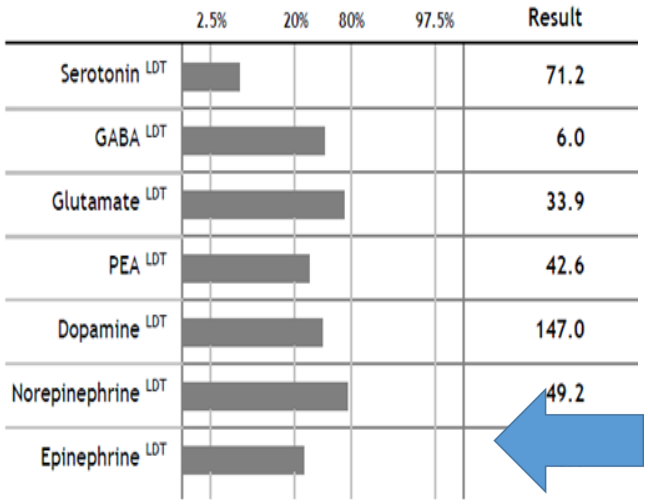


About 1 year later.
Note: indication of adrenal fatigue

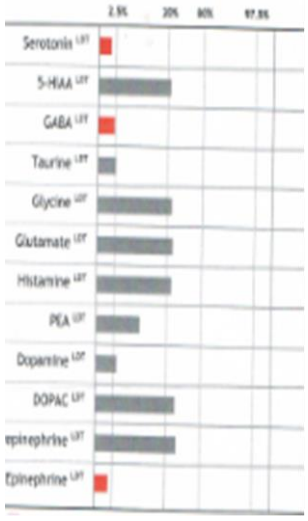
Let's look at the sequence of NT patterns as the neuro system's ability to compensate over time



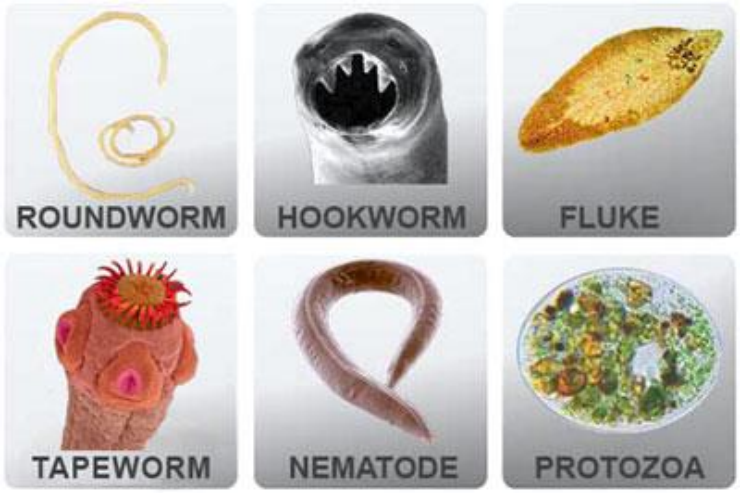
About 3 years later.
Inhibitory NTs are lower & more definite adrenal fatigue



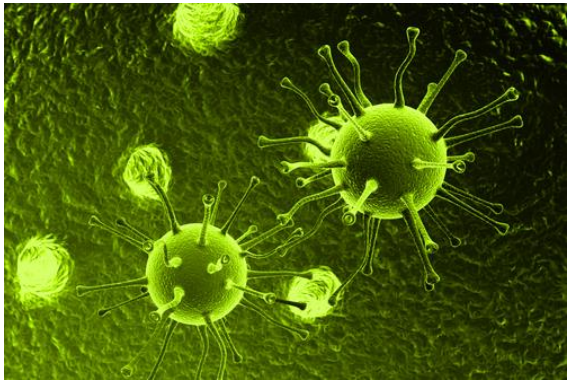
10 years later, ALL NT's are on their way down



15-20 Years.
Pretty Much Exhausted



Microbial Involvement



Lyme Disease: Adult Symptoms

Close Window

Fast Facts

- Lyme is fastest growing vector-borne disease
- 85% do not recall tick bite
- Less than 70% of people develop a rash
- Treatment should begin without testing if rash is present
- Lab tests may be negative in the first 4-6 weeks

Early symptoms

- Flu-like illness (fever, chills, sweats, muscles aches, fatigue, nausea and joint pain)
- Rash (10% have EM rash)
- Bell's palsy

CHILDREN'S SYMPTOMS

Later Symptoms

- Headache
- Stiff neck
- Light or sound sensitivity
- Cognitive impairment
- Sleep disturbance
- Depression, anxiety, or mood swings
- Arthritis
- Fatigue
- Abdominal pain, nausea, diarrhea
- Chest pain, palpitations
- Shortness of breath
- Tingling, burning or shooting pains

Children's Symptoms

Lyme pediatric specialist Charles Ray Jones, MD, compiled a list of common symptoms of infection in his young patients:
severe fatigue unrelieved by rest
insomnia
headaches
nausea, abdominal pain
impaired concentration
poor short-term memory
inability to sustain attention
difficulty thinking and expressing thoughts
difficulty reading and writing
being overwhelmed by schoolwork
difficulty making decisions
confusion
uncharacteristic behavior
outbursts and mood swings
fevers/chills
joint pain
dizziness
noise and light sensitivity

Dr. Jones has also documented congenital, or gestational, Lyme disease in some children who were infected in utero or by breastfeeding. *In these patients his suspicion is raised when the child has:*

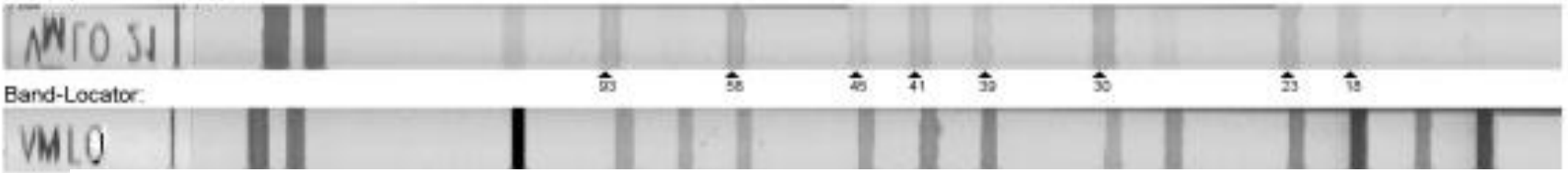
- **frequent fevers**
- **increased incidence of ear and throat infections**
- **increased incidence of pneumonia**
- **irritability**
- **joint and body pain**
- **poor muscle tone**
- **gastroesophageal reflux**
- **small windpipe (tracheomalacia)**
- **cataracts and other eye problems**
- **developmental delay**
- **learning disabilities**
- **psychiatric problems**

http://www.lymedisease.org/resources/children.html

Hong Kong: 27 year old female with recalcitrant anxiety

Bands,kD	93	66	58	45	41	39	34	31	30	26	23	18
Intensity, % of Cut-off	096	-	120	036	076	056	-	-	120	-	093	060

Patient: 21

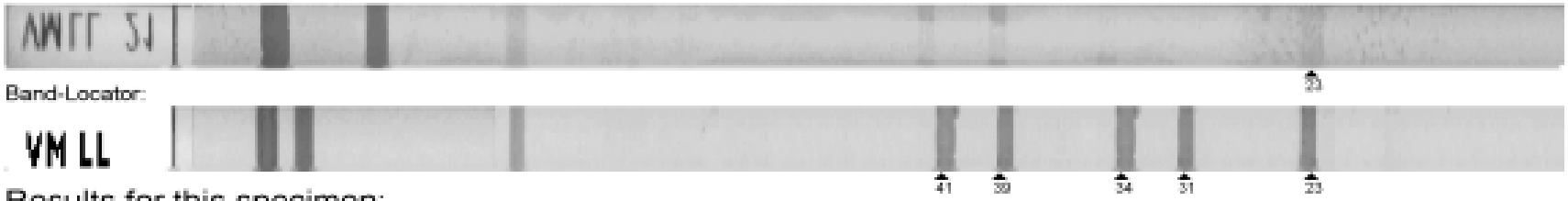


Bands,kD	41	39	34	31	23
Intensity, % of Cut-off	-	-	-	-	045

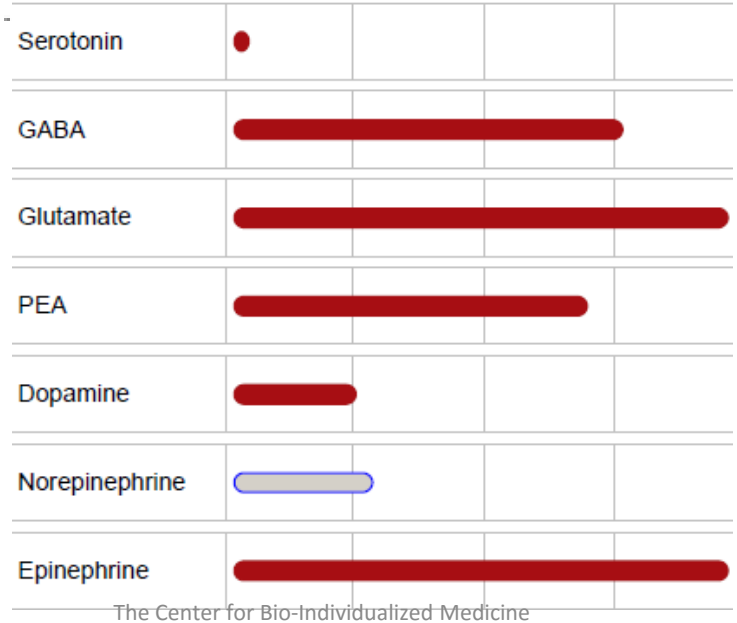
IGG

IGM

Patient 21



Results for this specimen:



Of Interest

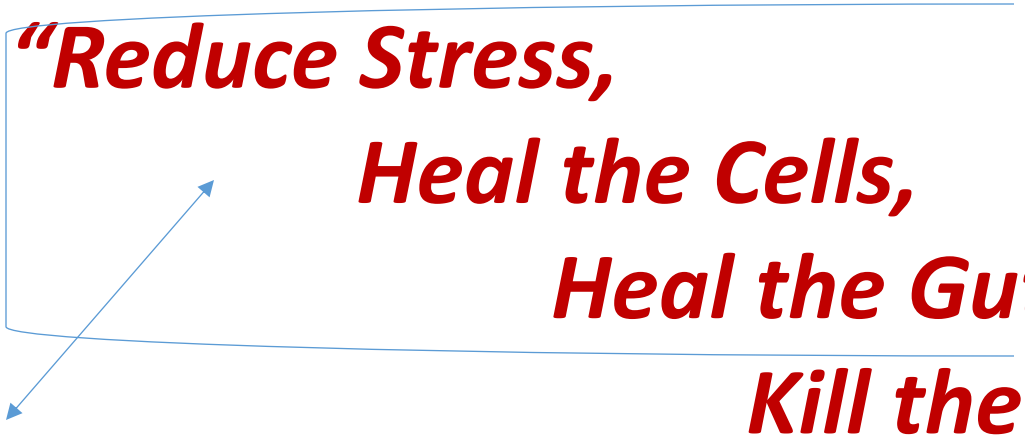
Table 1
Disorders corrected or improved by antipurinergic therapy.

Disease	Species	Antipurinergic drug	Reference
Autism	Mice	Suramin	Naviaux et al. (2013)
Spinal cord injury	Rats	Brilliant Blue G	Peng et al. (2009)
Traumatic brain injury	Rats and Mice	MRS2179	Choo et al. (2013)
Ischemic brain injury	Rats	Suramin	Kharlamov et al. (2002)
Glutamate excitotoxicity	Rats	Suramin	Bezvenyuk et al. (2000)
Epilepsy	Mice	A438079	Engel et al. (2012)
Rheumatoid arthritis	Rats	Suramin	Sahu et al. (2012))
Chronic pain	Rats	P2X3-15h	Cantin et al. (2012)
Multiple sclerosis	Mice	Suramin	Novales-Li (1996)
Lupus erythematosis	Mice	Suramin	Ballok and Sakic (2008)
Restenosis after angioplasty	Rabbits	Suramin	Gray et al. (1999)
Duchenne cardiomyopathy	Mice	Suramin	de Oliveira Moreira et al. (2013)
Heart failure	Rats	Apyrase	Marina et al. (2013)
Alcoholic liver disease/cirrhosis	Rats	Suramin	He et al. (2013))
Asthma	Guinea Pigs	Suramin	Oguma et al. (2007)
Emphysema	Mice	Suramin	Cicko et al. (2010)
Diabetic kidney disease	Rats	Suramin	Korrapati et al. (2012)

Suramin: Anti Parasitic Drug
Apyrase: Used to treat Trichomonas

Treatment options

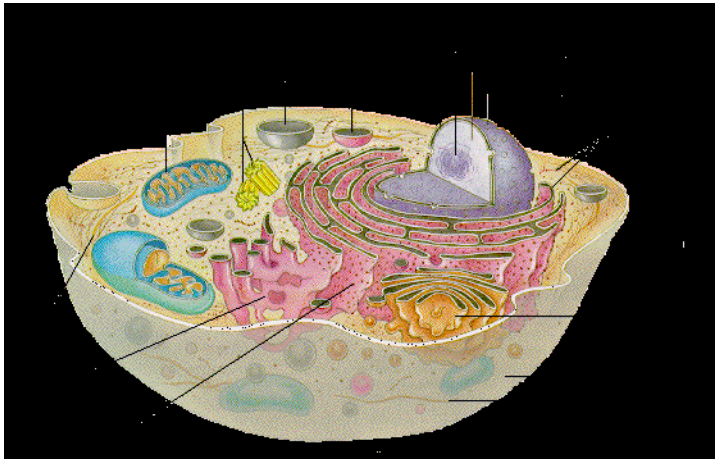
The Order of Treatment

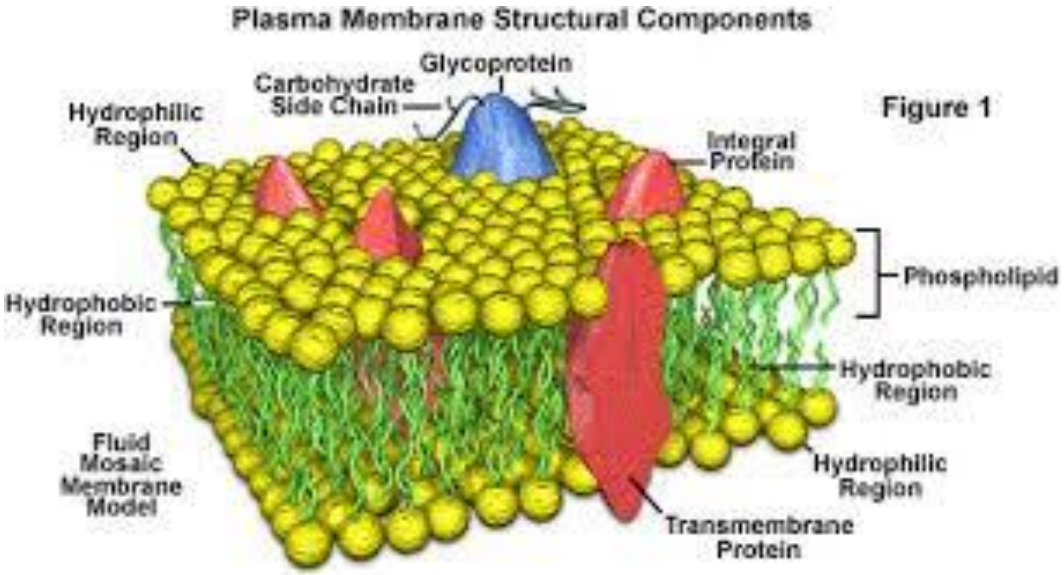


Reduce Stress

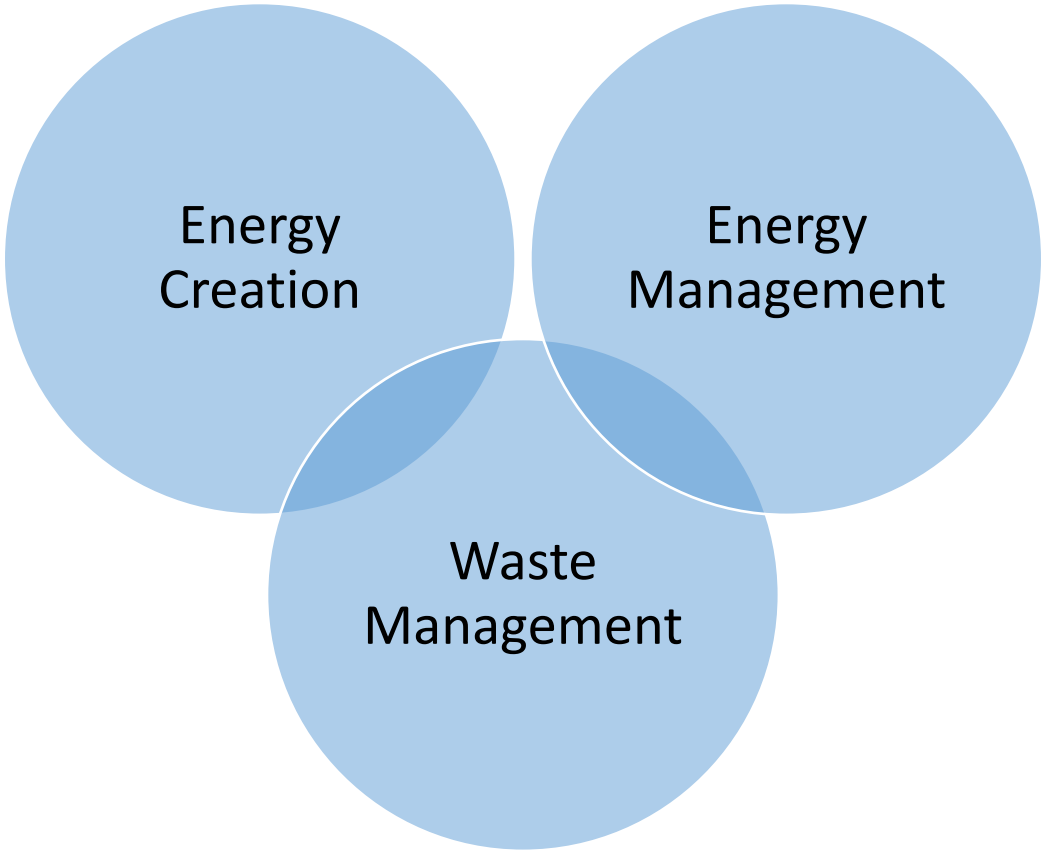
I Think We Sometimes Forget,

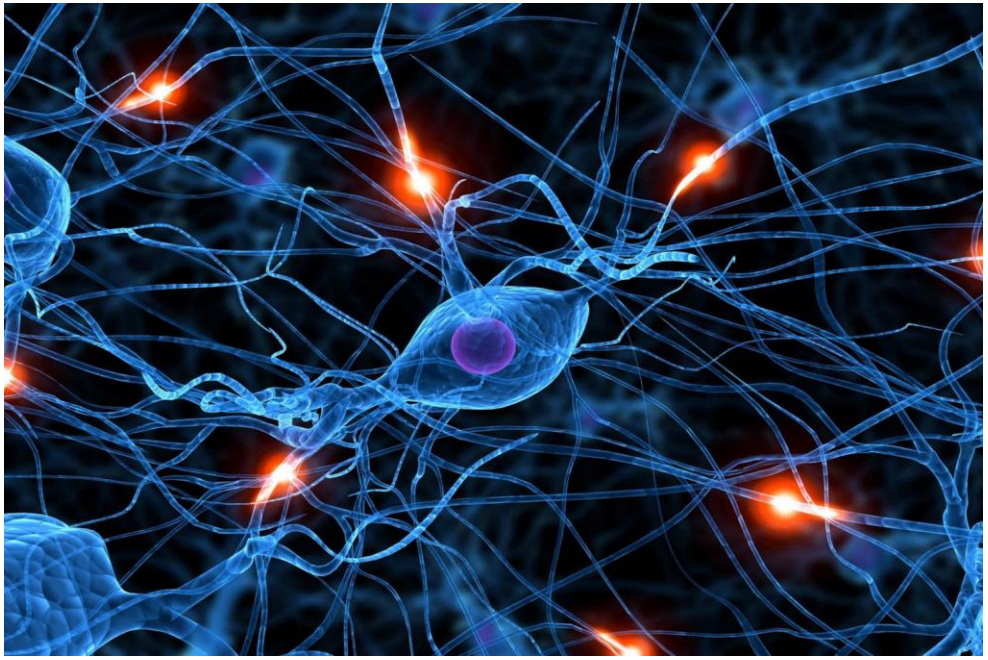
The *Foundation* of Life Happens in THE CELL!!





Basis of Cellular Function…





Neurotransmitters

Balance

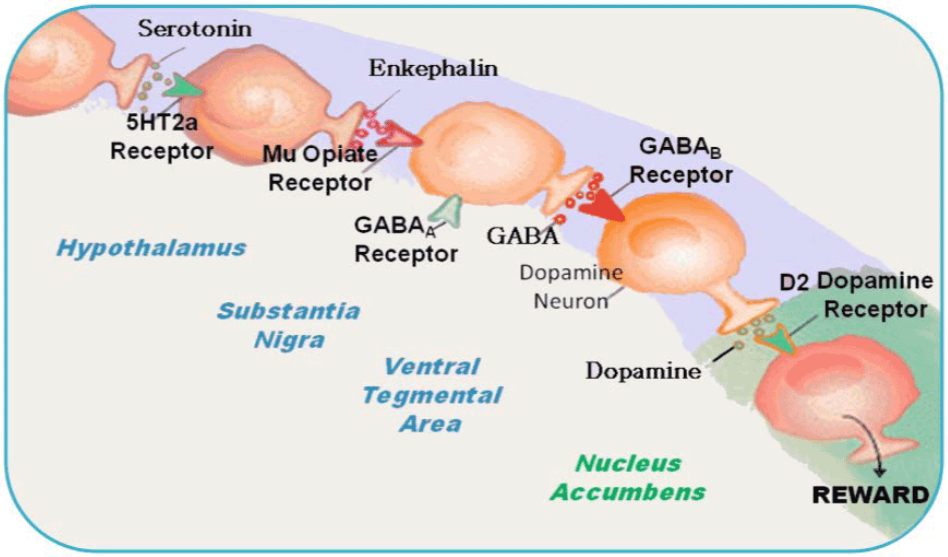
TA AT

stands for

Targeted Amino Acid Therapy

Abbreviations.com

Dr. Kellerman



Neurogenetics and Nutrigenomics of Neuro-Nutrient Therapy for Reward Deficiency Syndrome (RDS): Clinical Ramifications as a Function of Molecular Neurobiological Mechanisms

Kenneth Blum1,5,6,8,10,11,12,15,*, **Marlene Oscar-Berman**2, **Elizabeth Stuller**3, **David Miller**4,5, **John Giordano**6, **Siobhan Morse**6, **Lee McCormick**7, **William B Downs**5, **Roger L Waite**5, **Debmalya Barh**8, **Dennis Neal**9, **Eric R Braverman**1,10, **Raquel Lohmann**10, **Joan Borsten**11, **Mary Hauser**12, **David Han**13, **Yijun Liu**1, **Manya Helman**14, and **Thomas Simpatico**15

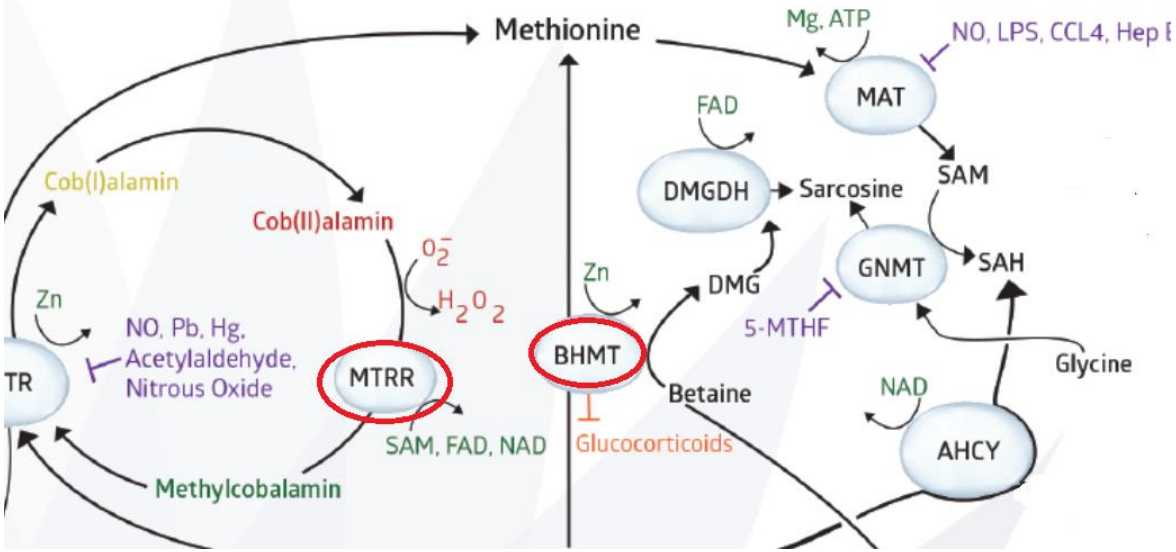
Treatment for Emotional Trauma

1. Emotional Release Technique
2. Cellular Emotional Release Technique
3. Emotional Release Technique Tapping
4. Emotional Trauma Therapy
5. Trauma Counseling Techniques
6. Emotional Healing Techniques
7. Trauma Group Therapy Techniques
8. Neuro Emotional Technique
9. EMDR (Eye Movement Desensitization and Reprocessing Therapy)

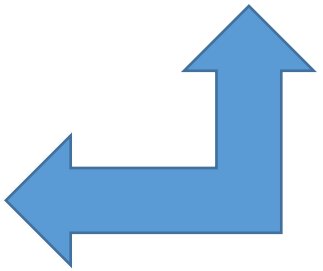
Medicines usually don't help get rid of the downstream effects of these root causes

BHMT

Pearl: Patients like this will internalize stress and/or have chronic dysthymia. People with this pattern who have PTSD will respond better to EMDR than psychotherapy (talk therapy)



BHMT-02	+/+
BHMT-04	+/+
BHMT-08	+/+
BHMT R239Q	-/-

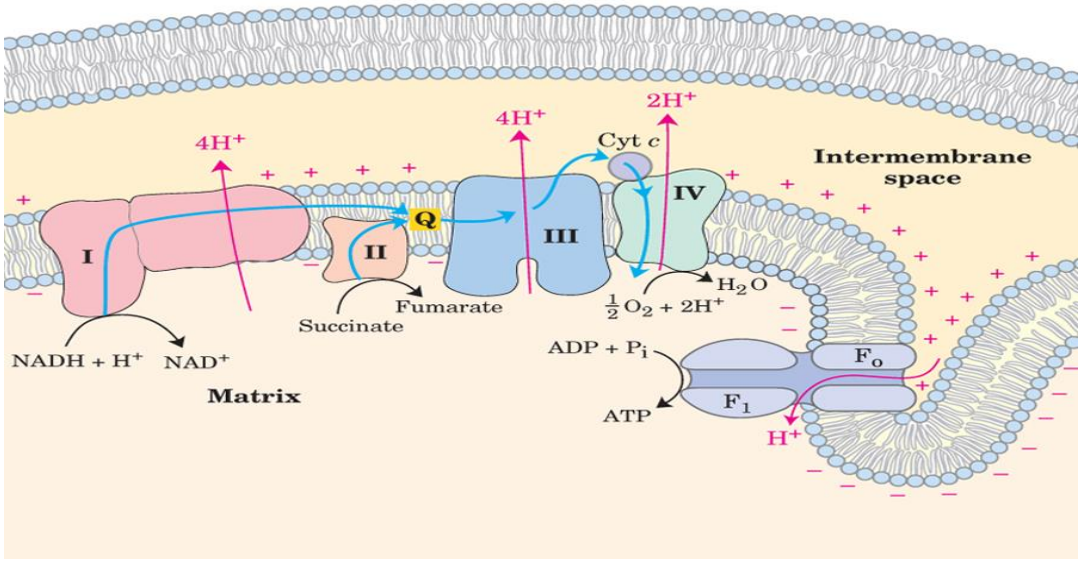


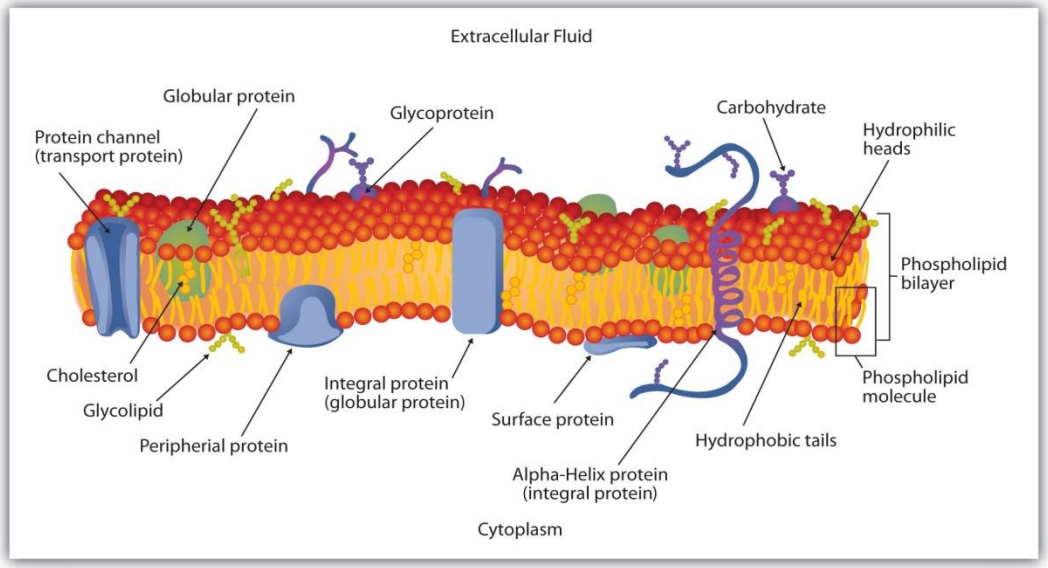
Obeid, Rima. "The Metabolic Burden of Methyl Donor Deficiency with Focus on the Betaine Homocysteine Methyltransferase Pathway." *Nutrients* 5.9 (2013): 3481–3495. *PMC*. Web. 30 July 2015.

To Address Mood Disorders, you MUST consider

Not only Neurotransmittter imbalances but:

- Causes of inflammation
- The integrity of the cell wall
- Mitochondrial function
- Nutritional deficiencies
- Genetic polymorphisms
- Nutrigenomics
- And more…





But if you want to get well…

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Evidenced Based References

- NEI: https://www.neurorelief.com/index.php?p=cms&cid=108&pid=85&type=1
- Brain Basics: http://www.nimh.nih.gov/health/educational-resources/brain-basics/brain-basics.shtml
- The Brain from Top to Bottom: http://thebrain.mcgill.ca/flash/i/i_01/i_01_m/i_01_m_ana/i_01_m_ana.html
- Neurotransmitters, An Introduction: http://mybrainnotes.com/serotonin-dopamine-epinephrine.html
- Epigenetics of depression. Lolak S, Suwannarat P, Lipsky RH. Prog Mol Biol Transl Sci. 2014;128:103-37. doi: 10.1016/B978-0-12-800977-2.00005-X. PMID: 25410543