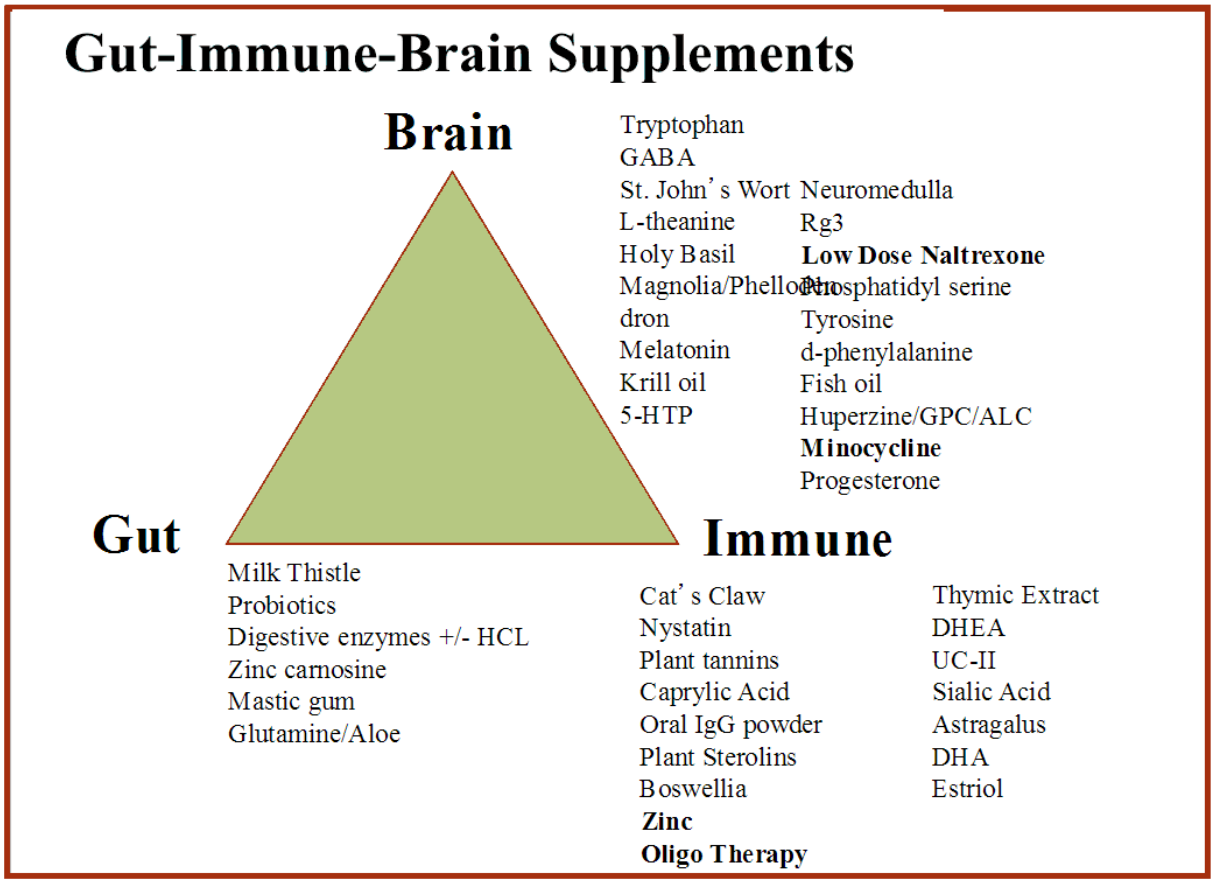
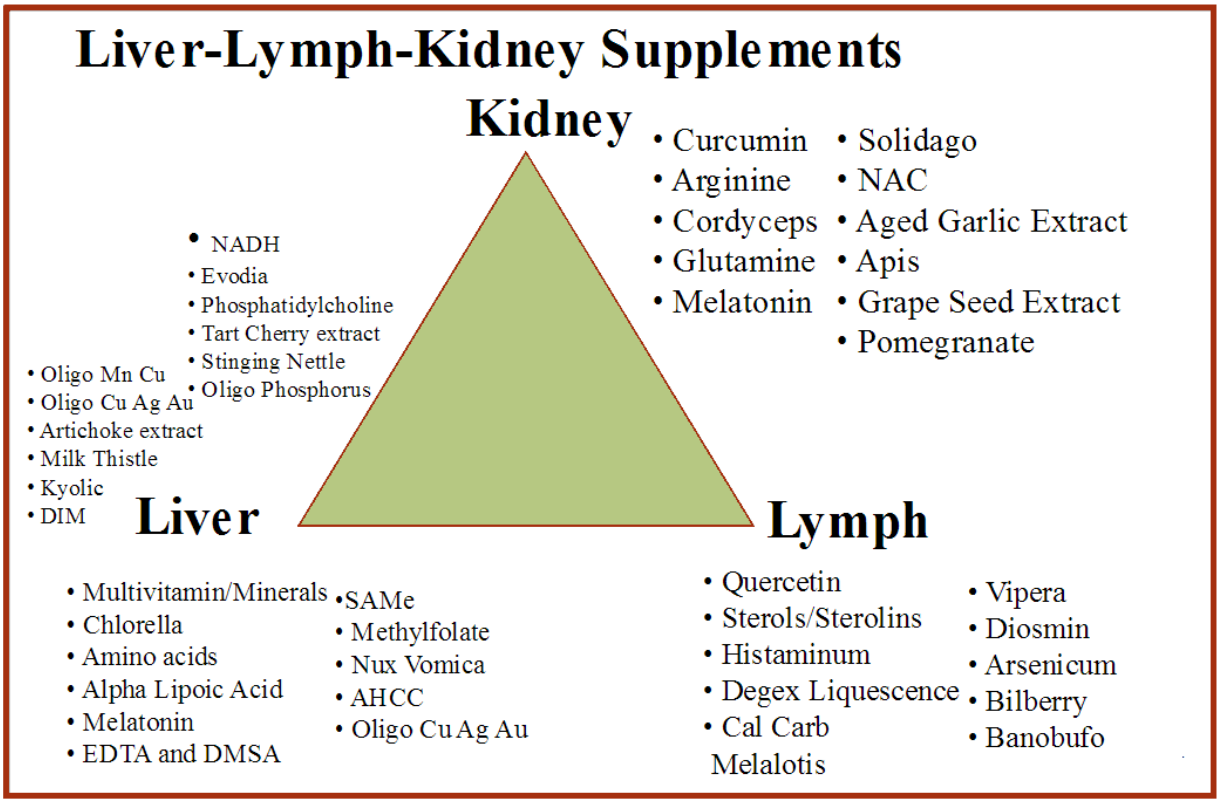
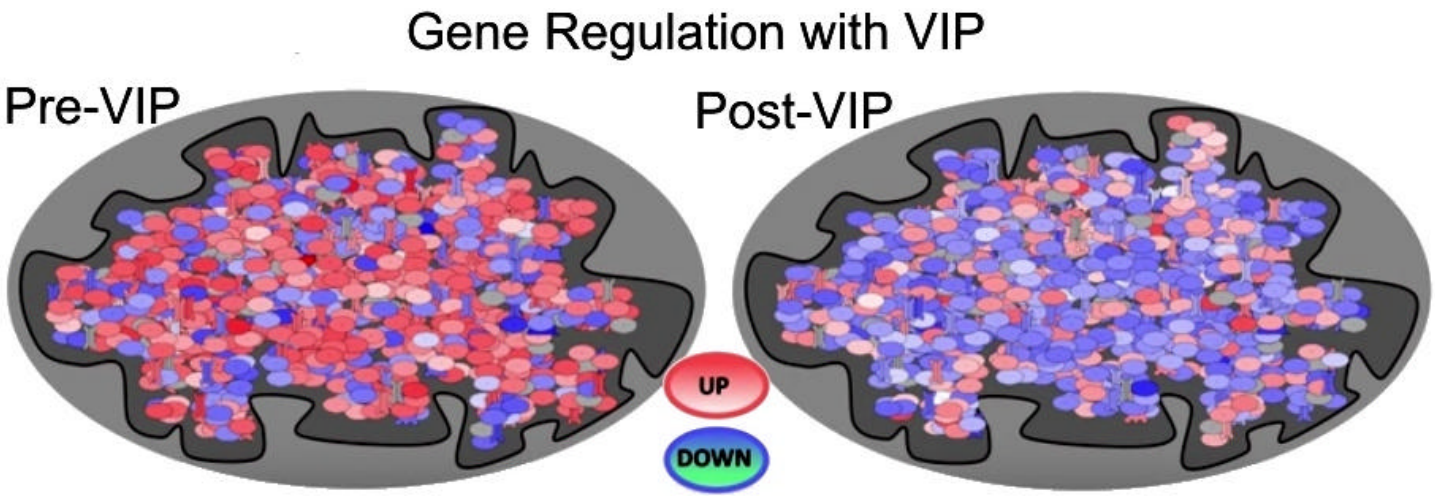




It's Not Lyme, It's Mold – Dr. Andrew Heyman & Dave Asprey #557
https://blog.bulletproof.com/dr-andrew-heyman-557/

- Dr. Heyman had Lyme got better with treatment but then got CIRS from mold.
- Dr. Heyman continues to work with Dr. Shoemaker in helping to expand therapeutic options.
- While symptoms and proteomics (blood labs) are same due to Lyme and mold, the NeuroQuant brain scans and genomics are distinctly different.
- Up to 22% (40 million people in the U.S.A.) are susceptible to getting CIRS from mold.
- The chemicals from mold can cause irrational and aggressive behavior.
- Treating with VIP to heal the brain damage from biotoxins is essential.
- Rb1, Rb3, and Rg3 from ginseng are neuro-protective with Rg3 being the best.
- Rg3 and Nicotinamide Riboside (NR) are available in a nasal spray to help brains on fire focus and concentrate. The Rg3 and NR nasal spray (Synapsin) also helps those with traumatic brain injury and concussions. A sublingual, over-the-counter, version may be available soon.
- Particular genes become activated upon exposure to biotoxins and don't turn off without treatment for those that are susceptible to CIRS.



- There is a relatively new geneomex test called NanoString available on the Surviving Mold website along with BulletProof Upgrade Labs in California. This test looks at the RNA being produced from DNA (transcriptomics) in order to be able to tell what genes are and are not activated. Out of the 900 genes examined, 500 are inappropriately turned on in Lyme and 700 in mold. The gene activation signature for Lyme and mold are distinctly different. The current testing has refined the number of genes examined down to 215. Testing can discriminate between Lyme, post-Lyme CIRS, mold CIRS, and hypo-metabolism.
  GENIE (Genomic expression by Nanostring: Inflammation Explained) $700 – shipped on dry ice
  https://www.survivingmold.com/treatment/genie-genomic-expression-by-nanostring-inflammation-explained-now-available
- Currently, you need a script to get the NanoString test kit that you take to a local lab for a blood draw. However, they are working on making the test available without having to pay for a doctor.
- When a CIRS doctors isn't available, individuals can make a lot of progress through self-treatment.
- Agricultural chemicals cause mold in the fields to emit more mycotoxins in defense.
- Eating junk food with trans and other bad fats (fried foods, peanut butter, etc) slows bile movement and consequently the clearing of toxins.
- Basic CIRS Treatment
  1. Dr. Heyman uses oral and IV lipids that include phosphatidylcholine (PC). PC helps the outer membrane on mitochondria. In addition, taking phosphatidylinositol and posphatidylethanolamine is important for the inner mitochondria membrane. Since IVs generally only have PC, it's important to take oral sources that contain all three forms of lipids (fats). Dr.

Heyman has seen dramatic results using phosphatidylcholine. It can take close to two years taking lipids to turn over the cell membranes. Correcting lipids corrects abnormal gene expression.

2. Stephania root helps for people that are really inflamed. BulletProof makes Curcumin Max with stephania root. https://www.bulletproof.com/products/curcumin-max-60-ct
3. Chia and flax seed help repair the blood-brain-barrier along with sealing up membranes. Dave commented that the omega-3 oil in chia and flax are easily damaged by light and heat along with containing higher amounts of lectins. Dave has not done well with them. Dr. Heyman says it's important to get quality seeds that are kept refrigerated and lightly ground to prevent heating just before consuming them in a cold drink. Do not use pre-ground products.

Underlying Metabolic Conditions and Chronic Lyme Disease with Dr. Andrew Heyman – Feb 2016
https://youtu.be/7_fisgk2dm4?list=PLJzdFObNfpri8o9UxGtPZ-oGus-8hMzOX

- Conventional ILISA and Western Blot testing methodology
  - False Negatives – testing misses up to 70% of infected patients.
  - False Positives - happen only infrequently
- Babesia (parasite) and Bartonella (bacteria) co-infections are common with Lyme. If any one is present, it is assumed they are all present and treated accordingly
- Dr. Heyman likes the Lyme NanoTrap test (urine antigen) with 85-95% specificity (5-15% false negatives) for untreated individuals. The test looks for bits and pieces of the Lyme spirochete (outer surface protein A). Consequently, it it's positive, the person has Lyme disease. Cost is $250. Note: It is unknown how accurate the test is for those that have undergone some form of Lyme treatment. https://www.lymedx.com/
- Ignex, iSpot, Lyme Culture tests are too sensitive - have many false positives.
- PCR Lyme testing has a high specificity (most likely right if it comes back negative), but low sensitivity (often misses positive cases).
- Dr. Heyman has had some success with the LabCorp C6 Lyme Antigen test.
- Lyme and co-infections can all trigger the same inflammatory innate immune response.
- There is a lot of symptom overlap between Lyme and various co-infections because they all trigger the same inflammatory immune response – trying to diagnose based upon symptoms is ineffective.
- In a subset of patients, the acquired immune system does not create anti-bodies so the innate immune system remains stuck in overdrive (CIRS).
- Dr. Heyman looks at HLA-DR testing, NeuroQuant, and CIRS labs to help diagnose Lyme.
- As TGF-beta 1 rises so do the inflammatory T-Helper 17 cells (TH-17) often associated with autoimmunity diseases.
- The regulatory T-cells CD4 and CD25 counts drop over time. Levels below 3 are a "real problem" – losing regulation of the immune system.
- CIRS patients are often hypoxic due to cytokines raising Hypoxia Inducible Factor (HIF) levels.
- The nervous system is hit hard by CIRS.
- The cytokine storm associate with CIRS damages leptin receptors resulting in weight gain.
- MSH influences many functions including the tight-junctions in the gut. When attempts to clear up gut issues through diet and supplements don't' work, low MSH may be the underlying cause.
- Generally, C4a is between 6,000-8,000 in Lyme disease and above 15,000 with mold.
- Biotoxins in poorly cleaned swimming pools can cause CIRS.
- Roughly 500,000 people are exposed a year to ciguatoxins from fish that can cause CIRS.
- CIRS Symptoms
  - headache
  - fatigue
  - aches
  - light sensitivity

    - poor memory
    - difficulty word finding
    - poor concentration and focus
    - word finding
    - short term memory
    - obsessions & compulsions
    - social anxiety
    - fears and phobias
    - retreat from social interactions
    - unusual skin sensations
    - shortness of breath
    - pulmonary hypertension
    - TGF-B1/VEGF/C4a abnormal
    - tingling
    - lower VO2 max
    - cough
    - thirst
    - confusion
    - right side of heart dysfunction
    - poor appetite regulation
    - body temperature instability
    - frequent urination
    - red eyes
    - blurred vision
    - variable mood
    - ice pick pains
    - depression
    - anxiety and panic attacks
    - OCD behavior
    - psychosis
    - delusions
    - paranoia
    - seizures
    - abdominal pain
    - diarrhea
    - belly numbness
    - gastroparesis (stomach takes too long to empty food - nausea, vomiting, feeling full)
    - gallbladder dyskinesia (gallbladder does not empty leads to upper right abdominal pain)
    - SIBO (small intestinal bacterial overgrowth)
    - chronic constipation
    - ileus (lack of bowel movement)
    - orthostatic hypotension (low blood pressure upon standing)
    - POTS (lightheadedness and fainting upon standing)
    - various autonomic dysfunctions
    - disorientation
    - static shocks
    - vertigo
    - sensitivity to changes in weather (barometric pressure)
    - irritable
- Persistent symptoms after treating Lyme may be due to CIRS rather than Lyme reactivation.
- Lyme patients with CIRS do worse on the visual VCS test after Lyme treatment.

- Treating CIRS also includes detoxifying heavy metals and chemicals.
- TGF-beta1 directs T-regulatory cells into tissue (to suppress inflammation and autoimmunity but in CIRS are turned into T-effector cells that worsen both).
- NeuroQuant often helps diagnose mold versus Lyme.
- Dendritic pruning (shrinkage) in the brain due to interstitial edema (swelling) can often be repaired with VIP nasal spray.
- Prolonged brain interstitial edema (swelling) may lead to permanent damage (atrophy/shrinkage)
- Mold tends to increase the Forebrain Parenchyma, Cortical Gray, Pallidum, and Hippocampus along with a decrease in the Caudate. The key indicators are increased Forebrain Parenchyma and Cortical Gray along with a decreased Caudate. The caudate returns to normal very slowly with VIP nasal spray.
- Lyme tends to have normal Hippocampus, Caudate, and Cortical Gray. In addition the Forebrain Parenchyma and Putamen are smaller while the Thalamus and Cerebellum brain regions are enlarged.
- A NeuroQuant score over 4 is positive for mold or Lyme. Note: In a 2018 presentation, the threshold was changed to 5. 49:20
- Dr. Heyman's Treatment Protocol
    - Testing for Lyme makes sense but realize every test has limitations.
    - It takes 10-24 months to arrest Lyme and treat CIRS.
    - Lyme patient that have been correctly treated that then fail the VCS visual test have CIRS.
    - If antibiotics are used, protect the GI tract with probiotics.
    - Good diet, mineral and nutrient supplementation along with a morning urine pH above 6.8 is very important.
- Dr. Heyman Initial 4-Week Treatment
  These compounds are often given for a month prior to Lyme antibiotics in order to prevent an unbearable exacerbation of symptoms.
    1. Rg3/NR nasal spray (Synapsin)
       https://tccompound.com/product/synapsin/
    2. MetaGenics SPM Active
       MetaGenics has a 10-year patent on SPMs. Specialized Pro-Resolving Mediators, or SPMs, are derived from fish oil and have a powerful effect on reducing inflammation. Protectins, Resolvins and Maresins (SPMs) are not anti-inflammatory like curcumin or aspirin. They are cell signaling molecules that reflect the latest understanding on how inflammation is turned off. Start with a "loading dose" of 6 tablets daily for two weeks followed by 2 tablets daily.
       https://amzn.to/2ULpy4M

       Resolvins and Protectins: Mediating Solutions to Inflammation
       https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2785519/
       Resolution of inflammation has historically been viewed as a passive process, occurring as a result of the withdrawal of pro-inflammatory signals, including lipid mediators such as leukotrienes and prostaglandins. Thus, most anti-inflammatory drugs have traditionally targeted primarily mediator pathways that are engaged at the onset of inflammation. Only recently has it been established that inflammation resolution is an active process with a distinct set of chemical mediators. Several clinical and epidemiological studies have identified beneficial effects of polyunsaturated fatty acids (PUFAs) for a variety of inflammatory diseases, yet without mechanistic explanations for these beneficial effects. Resolvins and protectins are recently identified molecules that are generated from ?-3 PUFA precursors and can orchestrate the timely resolution of inflammation in model systems.
    3. Phosphatidylcholine & Butyrate
       Phosphatidylcholines (PC), also known as lecithin, are specialized fat molecules that are used to construct cell membranes. Related to CIRS, PC helps repair the nervous system and mitochondria along with reversing dendritic pruning in the brain by healing the myelin sheath. Butyrate is a type of fatty acid that helps your gut. Dr. Heyman likes BodyBio PC because it's

imported from Germany.
https://biotoxinjourney.com/block-detox/#Phospholipids
https://amzn.to/2HZJOOt $1.50/day – expensive

4. Severe Anxiety – Poor Sleep – Panic Attacks – Etc.
    - Lyrica – pain management with long list of side effects including dizziness, constipation, swelling, and suicidal thoughts along with wicked withdrawal symptoms similar to benzodiazepines. Use small doses
    - Lamictal (lamotrigine) - mood stabilizer and anticonvulsant with a long list of side effects including vision, clumsy, rash, anxiety, confusion, depression, diarrhea, chills, and unusual bleeding along with withdrawal symptoms. Lamictal is associated with life threatening skin reaction, Stevens-Johnson syndrome (SJS). Dr. Heyman has never seen an SJS reaction in his patients. Use small doses
    - Neurontin (Gabapentin) – when insurance companies deny Lyrica and Lamictal. Gabapentin treats seizures, neuropathic pain, hot flashes, and restless legs syndrome. I've used between 50-100mg of this old class of drug in the evening to help when nothing else works without any side effects.
    - Seroquel – when sleep is an issue Dr. Heyman may prescribe 25-50mg. Seroquel is often used to treat schizophrenia and bipolar disorder. When seroquel causes fatigue in the morning, use trazodone.

- Lyme Infection Eradication
  Since antibiotics are unproven for the treatment of Lyme, it is up to the patient to decide if they want to use herbs or antibiotics. If a patient wants to use herbs, Dr. Heyman uses one of three protocols.
    - Anti-Microbials
        - Cowden Protocol – very organized, off-the-shelf, one size fits all protocol. Patients do well but must drink a lot of water and be able to handle dosing 4 times daily. Has a lot of built-in support so can lighten up on other remedies.
        - Byron White Formulas – less guidance but simpler. Treats Lyme, Bartonella, and Babesia. Build to a maximum of 15 drops increasing by one drop every 3-4 days. Don't increase if symptoms worsen. Treat Bartonella and Babesia before Lyme.
        - Dr. Patricia Kane BodyBio – gentle so works well with kids and the really sick. May need to add in either Cowden or Byron later.
          https://patriciakane.net/
    - Antibiotics (details start at 1:08:00)
        - Treatment uses a lot of antibiotics for an extended time (18 months). Dosing involves pulsing and cycling multiple antibiotics simultaneously with down time in-between.
        - Various combinations are used of Mepron – Malarone – Minocycline – Septra - Cipro
        - Biaxin with Omnicef – for those who can't tolerate penicillin
        - Flagyl or Tindamax – pulsed to kill Lyme cysts
        - Monthly blood work to monitor liver and kidneys should be under 100.
        - After 17 weeks of Lyme treatment, Minocycline is removed and Micobutin or Rifabutin are added to kill Bartonella.
        - After another 17 weeks, Rifabutin is removed and Malarone along with Artemisia are added to kill Babesia.
        - Finally, lumbrokinase, lactoferrin, and xylitol are added to knock out biofilms.
- Supplements – Month One
    - Multi-vitamin
    - Gentle detoxifier like chlorella, Advanced Cellular Zeolite (ACZ)
    - Herxheimer support – chlorella, green clay, Burbur drops for herx (10 drops under tongue every hour), and super aloe (1/2 cup)
    - Digestion issues – white grape juice
    - Drainage remedy

    - Alpha lipoic acid for liver and detox
    - ForaMend Prime probiotics for gut
    - Saccharomyces boulardii for yeast
    - Fish oil or SPM
    - Phosphatidylcholine
    - Butyrate (3 capsules 2x daily)
    - Topamin? for inflammation 1:23:00
    - Deplin or Methyl Protect for methylation support
    - Low Dose Naltrexone (LDN) for "immune tone"
    - Rg3/NR nasal spray – PB Labs
    - Compounded methyl-B12, hydroxyl-B12, P5P, folinic acid, and oxytocin – oxytocin with methylation support calms the brain
      PB Labs by Ray Salano in Austin Texas
      https://pdlabsrx.com/
    - Matrix electrolytes with almond/coconut milk, baking soda, and galactose (monosaccharide)
    - Weekly Myers' Cocktail with Glutathione
    - Baking soda and Epsom salt baths several times a week
- Supplements Month Two
    - Thorne Research Q-Best 100 Ubiquinone Formula (CoQ10) – mitochondria
    - Youthful Energy with NTFactor (two packs with each meal first two months then one pack) or BodyBio PC (phosphatidylcholine)
- Supplements Month Three
    - Bio-EnR-GY-C with Intestinal Metals Detox (IMD) – deeper detox
    - Lumbrokinase – biofilm busting
- Supplements Month Five
    - DMSA – deeper detox
- Additional Testing
    - Food allergy panel (Alletess, Dunwoody Labs, Elisa ACT)
    - Morning urine pH above 6.8
        - Meats, beans, legumes, grains, nuts, milk and cheeses lower pH
        - Most fruits and vegetables increase pH except cranberries and blueberries lower pH
- Additional Detox Strategies
    - Infrared Sauna
    - Hyperbaric oxygen
    - UVLRx Intravenous UV Light Therapy
    - Dry brushing, massage, lymphatics
- CIRS
    - Failure of VCS after treating Lyme means must address CIRS
    - Binder – like Cholestyramine
    - Treat MARCoNS
    - Food allergies
    - Hormones - DUTCH Precision Analytical Hormone Test
      https://mylabsforlife.com/lab-test/dutch-complete-precision-analytical-hormone-test-kit/
    - ADH/Osmolality – desmopressin (DDAVP)
    - MMP9 – if high use Boswellia
    - VEGF – usually corrects by itself
    - C3a – if high use SPM
    - C4a- if high use fish oil
    - TGF-beta1 – if high use losartan at 25mg per day
    - Brain – VIP and Rg3/NR nasal spray (NeuroQuant to confirm repair)

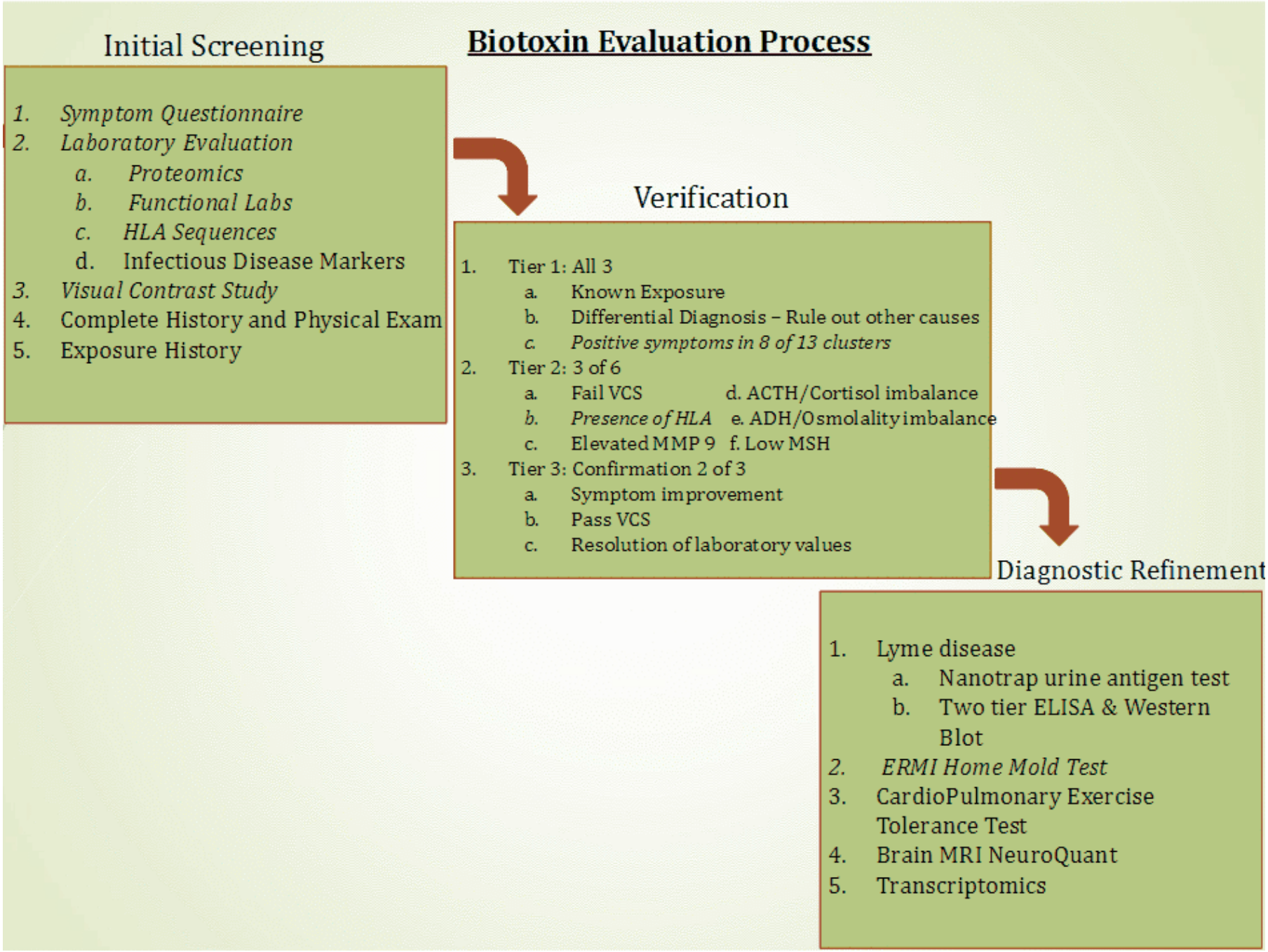
Webinar Dr Heyman: Biotoxins & Inflammation
https://youtu.be/HLl7nH8jk1w

- "An accumulation of low grade exposures over time matters in terms of physiology and disease."
- Biotoxins from mold, parasites or pathogens like Lyme and various co-infections along with chemicals, and heavy metals primarily impact the Gut-Immune-Brain triad. 3:40
- Gut-Immune-Brain Triad
    - Primary command and control
    - Filtering, defense, repair
    - Major physiologic interfaces – gut and brain nervous system
    - Normal: organized and secure – loss of results in disorder and unpredictability
    - Imbalanced: disordered and unpredictable

  When a patient presents with gut dysfunction, food sensitivities, inflammation, aching joints, fatigue, anxiety, depression, and brain fog, Dr. Heyman focuses on biological and toxin exposures.
    - Gut – ability to control what is absorbed and discarded. The gut constitutes a "second brain". The gut is a "major sensing unit" for the brain. Toxins break down the gut resulting in irritable bowel, etc.
    - Immune System – decides what gets across the gut and elsewhere is a threat or not. Toxins inflame the immune system resulting in immune system flares, etc.
    - Brain –The gut and brain neural communication tends to be more efferent – from the brain to the gut. The nervous system of the gut, enteric nervous system, is linked to the brain and the immune system. Toxins create neuro-excitotoxcity in the brain resulting in depression, anxiety, etc.
      "*Afferent neurons are sensory neurons that carry nerve impulses from sensory stimuli towards the central nervous system and brain, while efferent neurons are motor neurons that carry neural impulses away from the central nervous system and towards muscles to cause movement*." https://www.varsitytutors.com/ap_biology-help/understanding-afferent-and-efferent-neurons
- Chronic Inflammatory Response Syndrome (CIRS) involves activation of the primal "innate" part of the immune system – not the "acquired" part. It is not a T-cell or B-cell mediated/acquired response.
- About 22% of the population has a genetic predisposition to over-reacting to biotoxins that does not quite down with time. They remain "perpetually inflamed".
- When the "terrain" is weakened by stress (psyche), gut dysbiosis, poor diet, drugs, heavy metals, and infections like Lyme, a person is more susceptible to CIRS. These adverse health factors alter the way the immune system responds.
- Microbes that trigger the innate immune system Dr. Heyman accesses for when evaluating a patient
    - Mycoplasma pneumonia, fermentans (bacteria), hominis
    - Lyme disease, Bartonella, Babesia, Ehrlichia, Rocky Mountain Spotted Fever
    - Protomyxzoa - pathogenic protozoan (parasite) related to malaria
    - Epstein Barr Virus
    - HHV-6 - Human herpesvirus 6
    - CMV - Cytomegaloviruss
    - Toxoplasmosis gondii - intracellular parasite related to bipolar and mood disorders (cats)
    - HSV I/II - Herpes Simplex Virus
    - Streptococcus - PANS
    - Mold
    - Note: Some patients that are only IgG positive (had a previous exposure), nonetheless have felt better and lower IgG levels when treated.

- The Th1 and Th2 balance shows dysregulation in CIRS along with elevated TH17 and IL6 due to high TGF-beta1. Furthermore, coagulation markers and the hypoxia inducible factor (HIF) tend to be higher while T-regulatory cells CD4 and CD25 are lower.
- Respiratory problems come from high C4a and abnormal VEGF.
- Folks with susceptible genes related to HLA-DR, MTHFR, CBS, and COMT can't clear toxins well.
- High cytokines dysregulate white blood cells making folks with CIRS more susceptible to chronic infections.
- C4a rises due to biological exposure, while C3a mainly rises with bacterial exposure like Lyme. High C4a and low C3a is indicative of biotoxins and not Lyme. Although, some with Lyme do have low C3a.
- High MMP breaks down connective tissue and increases IL-1 and IL-beta resulting in elevated d-dimer and anti-cartiolipin antibodies.
- CIRS often underlies adrenal fatigue, leaky gut, chronic fatigue, and fibromyalgia.
- Brain volume shrinkage is often a result of dendritic pruning in CIRS from mold. This pruning is often reversible but not always.
- See notes from the Chronic Lyme video regarding the typical volumes in the brain that swell and shrink in mold versus Lyme patients. Some do not follow the typical pattern but do have "multi-nuclear atrophy".
- Chemicals ubiquitous in our environment today often lead to insulin resistant and subsequent diabetes. Additionally, chemicals and heavy metals are linked to autism, attention-deficit hyperactivity disorder, dyslexia, and other cognitive impairments.
  Neurobehavioural Effects Of Developmental Toxicity
  https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4418502/
- CIRS patients that also have high heavy metal, pesticide, herbicide, and plastic levels are difficult to treat. They must be detoxified of heavy metal and chemicals along with treating CIRS.
- With time, untreated CIRS patients can develop schizophrenia, bi-polar, and seizure disorder.
- The kidneys cannot liberate and release heavy metals and chemicals without support. You need to re-mineralize, increase pH, improve diet, and reduce stress. pH is key; it's even more important than methylation.
- Detox details are discussed in Dr. Heyman's Metabolic Medical Institute's "A Metabolic and Functional Approach to Toxicology & Detoxification" that is not available to the public.

Biotoxin Treatment Process: Expanded
https://www.wholisticmatters.com/WholisticMatters/media/Wholistic-Matters/BiotoxinTreatmentProtocol-FINAL.pdf
Note: At the start of CIRS Part 3, Dr. Heyman said he is fine with others reproducing his lecture handouts and given them to others.



Biotoxin Treatment Process: Expanded

Foundations

1. *Low Inflammatory Low Mold Diet*
2. *Stress Management*
3. *Sleep support*
4. Lipid replacement
   a. Phosphatidylcholine 3.6 g/d
   b. Balance Oil 4:1 Omega 6/Omega 3
   c. Electrolytes
   d. Policosanol (Wheat Germ Oil)
5. Reduce NeuroInflammation
   a. *RG3 2mg/NR 2 mg nasal spray BID*
   b. Curcumin 1000 mg BID or Turmeric 1000 mg BID
   c. Resolvins 2-6 Tabs daily

Exposure Elimination

1. Lyme and Co Infections
   a. See *Lyme Protocol*
2. Mold remediation
   a. See *Tips for Mold Remediation Sheet*
   b. Maintaining cleanliness
      i. HEPA Vacuum cleaner
      ii. HEPA Units in trafficked rooms
      iii. Photocatalytic Air Purifier for home

Reduce Toxin Burden

Neurological	Respiratory	Gastrointestinal
VCS	MARCoNs	Nutrition

1. Biotoxin Management x 1-2 months
   a. *Cholestyramine 4 g QID or Okra*
   b. Soluble Fiber 11 g/d
   c. Multivitamin and minerals
   d. Oxbile 500 mg with meals
   e. N-acetyl Cysteine 1000 mg BID

↓ Pass VCS

2. Upper Respiratory Tract
   a. MARCoNs Nasal Swab
   b. BE or BEG Spray x 6 weeks

↓ Clear MARCoNs

3. GI Health
   a. IgG Food Panel
   b. Functional Digestive Test
   c. Ca/Mg/Butyrate 1.2 g BID

Metabolic Balance

Detox	Endocrine	Electrolytes
Chemicals/Metals	Hormones	Water Balance

1. Detoxification – pH above 6.5
   a. Chlorella 3 g BID/Clay/Okra
   b. Topical Glutathione

↓ Wait 4 weeks Before progressing

2. Hormone Balance
   a. Urine or Saliva Panel
   b. Block aromatase
      i. Chrysin 500 mg BID
      ii. Bilberry 6000 mg/d
   c. Balance Reproductive Hormones
      a. DHEA 25-50 mg daily
      b. BHRT

↓

3. Electrolyte/Water balance
   a. Remeasure ADH/Osmolarity
   b. Desmopressin 0.2 mg qohs
   c. Ca/Mg/Butyrate 1.2 g BID

nl: 1.0-13.3 pg/ml; Osmolality - 280-300 mosmol

Resolution and Repair

Connective Tissue	Innate Immune	Genomic/CNS
Degrading Enzyme	Complement & TF	VIP

1. Manage Destructive Enzymes
   a. Remeasure MMP9
   b. Low Amylose Diet
   c. Boswellia 400 mg TID

↓ MMP9<332

1. Reduce Complement Activation
   a. Remeasure C3a
      i. Red Yeast Rice 1200 mg BID
      ii. CoQ10 200 mg daily
   b. Remeasure C4a
      a. Fish oil 3:2 ratio 2 g BID
      b. Resolvins

↓ C3a<780 C4a<2830

2. Reduce Transcription Factors Activation
   a. Remeasure TGFB1
      a. Losartan 25-50 mg BID
      i. Bilberry 6000 mg/d
      a. L carnitine 1000 mg BID

↓ TGFB1<2380

3. *VIP Nasal Spray Protocol*

CIRS (Part 1) - Overview of Chronic Inflammatory Response Syndrome – May 2018
https://youtu.be/31Ftaa_PBRk

CIRS (Part 2) - Practical Tools For Treating Chronic Inflammatory Response Syndrome – May 2018
https://youtu.be/7dPNjLhe2OY

- **Foundation** - Patients are started immediately on the following while waiting the results of lab tests and continue with these foundation supplements for the duration of treatment.
    1. It's important to aggressively replace lipids (fats/oils) to heal cell membranes. As I discussed in Phospholipids, healthy cell membranes are critical in ATP energy production and detoxification. Dr. Heyman mentions the work of Dr. Patricia Kane – see the PK Protocol. CIRS cause bad lipids to build up around and inside the mitochondria – the energy factory of the cell. These bad fats cause inflammation, poor communication between cells, and consequently poor healing.

       Dr. Heyman uses Phosphotidylcholine (PC), a mixture of Safflower and Flax seeds, along with Wheat Germ oil as it contains polycosanol (see notes in It's Not Lyme, It's Mold about only using fresh seeds that are not inadvertently heated). Polycosanol helps with cholesterol but more importantly it is a "structural fat". Healthy oils are essential for the repair of the myelin sheath covering damaged (excoriated) nerves in CIRS.
       Phospholipids
       http://biotoxinjourney.com/block-detox/#Phospholipids
       The PK – Membrane Stabilizing – Protocol For Neurological Disorders
       https://pkprotocol.com/
        - Phosphotidylcholine (PC)
          1.8g of PC twice daily - 9 grams of typical 20% PC lecithin powder
          2Tbls of Swanson Sunflower Lecithin Powder twice daily (96 cents/day)
          https://amzn.to/2Gmmg4Q
        - Black Currant Oil or Fish Oil
          2-3 grams of Omega 6/3 oil in a 4:1 ratio twice daily. Note: Previously, Dr. Heyman recommended Safflower and Flax Seed Oil. However, there are issues with the oils easily going bad or being damaged by heat. Dave Asprey recommends krill oil as it doesn't spoil easily and only need half as much.
          Jarrow Formulas Krill Oil
          https://amzn.to/2URXfS4
        - Electrolytes
          Biotoxin Journey - Blocked Detox – ECM
          http://biotoxinjourney.com/block-detox/#ECM
        - Wheat Germ Oil
          NOW Wheat Germ Oil (18 cents/day)
          https://amzn.to/2SOJtSU
    2. Some CIRS patients turn to alcohol to help sedate the excitatory neuro-inflammation.
    3. Bruce McEwen describes how the body naturally down-regulates the stress response over time to help protect against chronic stressors like. For example, cortisol and DHEA levels that drop to down-regulate against chronic stress cause the immune system to become over-active. This leads to toxicity in the brain (microglial activation), less serotonin in the brain (happy neurotransmitter), and various symptoms related to inflammation.
       The Impacts of Stress on the Brain and Learning - Bruce McEwen Ph.D.
       https://youtu.be/9M-siizCB2Q
    4. Green tea contains L-Theanine that helps calm and focus the brain. Take 50-200mg two to four times daily.

Suntheanine L-Theanine 200mg (28 cents/day)
https://amzn.to/2I5rG5J

5. Plant Sterolins raise T-regulatory cells to help balance TH1, TH2, and TH17 aspects of the immune system. Rg3 is very helpful sterolin for CIRS patients with neurological issues. Synapsin contains Rg3 and Nicotinimide Riboside (NR). Spray nasally (2mg) twice daily for 3 months followed by 2 weeks off during the entire treatment process. It takes 2-4 weeks to see benefit. Alternatively, NR can be taken as an oral supplement at doses of 250 – 500 mg daily (take sublingually). Some don't see benefit from oral NR under 1,000mg.
6. Very Long Chain Fatty Acids (VLCFA), Trans Isomer fats, Saturated Odd fats, and Renegade fats build-up in the cell membranes forming "ceramide lipid rafts" that inhibit cell function. Butyrate clears these unhealthy fats. To prevent exacerbation of symptoms with butyrate, start by supplementing with healthy fats and oils first. Note: Lyme lives off VLCFA.
7. Curcumin is anti-inflammatory and crosses the blood-brain-barrier. Take 500-1,000mg daily.
8. Specialized Pro-Resolving Mediators, or SPMs, reduce painful inflammation and down-regulation of inflammatory macrophages and microglial cells.

- **Lyme** – Lyme is difficult to treat because it can transform into L and cyst forms to protect itself against treatment. As little as 33% of those infected with Lyme will get better with the standard one month of antibiotic treatment. In the USA, 300,000 have been diagnosed with Lyme and the number may be 10 times that amount. It's not uncommon for a person to be infected with additional pathogen besides Lyme – Babesia and Bartonella. Additionally, biofilms provide protection to pathogens and allow the exchange of DNA. As such, the approach is to treat all three pathogens. (Mold patients ignore this section)
    1. Artemisinin, wormwood, is a strong parasitic used to treat the parasite Babesia. Artemisinin treats a number of other parasites including Toxoplasma gondii that can cause bi-polar. In addition, wormwood has anti-viral properties and can be used to treat a flare in Epstein Barr Virus (EBV).
    2. In addition to Artemisinin, Dr. Heyman also uses Monolaurin, oil of oregano, and high-dose Valacyclovir to treat chronic viral infections.
    3. In addition to being anti-bacterial, high does Myrrh can treat parasites that reside deep in body like the liver and bladder. It's important to pulse anti-parasitics.
    4. Similar to anti-parasite herbs, antibiotics should be pulsed.
    5. Biofilms can be broken down with cranberry, tannin herbs, garlic, Oregano oil, Xylitol, Lactoferrin, and EDTA.
    6. Dr. Heyman starts with 30 days of doxycycline followed by 9-12 months of pulsing herbs to treat Lyme.
    7. See Underlying Metabolic Conditions and Chronic Lyme Disease for more details on Lyme treatment.
    8. Dr. Heyman also uses UVLRx Intravenous UV Light Therapy to treat Lyme
- **Mold Toxins** – this takes 1-2 months – continue taking while treating MARCoNS (Lyme patients ignore this section)
    1. Cholestyramine (CSM) 4 gram 4 times daily or Whelchol 2 tablets 30 minutes before meals or Okra – see Biotoxin Journey Binders. The positive charge on cholestyramine and whelchol bind to the negative charge on biotoxins. Additionally, the size of the receptor sites on cholestyramine and whelchol, 1.4 angstroms, is the same size as biotoxins. In contrast, clay, chlorella, charcoal, and zeolite are negatively charge and consequently repel biotoxins. Okra is the strongest known natural binder but is only 16-20% as strong as cholestyramine.

       Dr. Heyman speculated that a person would probably need to take double or triple the typical dose of Okra. However, in the study, the chart compares equal dry matter weights of CSM and Okra and shows Okra being 16% as effective. As such, the equivalent to a 4 gram dose of CSM equates to (4/0.16) = 25 grams of dried Okra. That is a lot of Okra to take 4 times daily, is way

more than two to three times the typical dose, and is very expensive!

The study also sites other foods that bind bile. "*Kahlon, Chapman, and Smith (2007) reported the bile acid binding, relative to cholestyramine, on dry matter basis, for raw fresh green leafy vegetables spinach (9%), kale (8%), brussels sprouts (8%), broccoli (5%), mustard greens (4%), green bell peppers (3%), cabbage (2%) and collards (2%).*"
https://pubag.nal.usda.gov/pubag/downloadPDF.xhtml?id=671&content=PDF

In vitro bile acid binding by okra (*Abelmoschus esculentus*), beets (*Beta vulgaris*), asparagus (*Asparagus officinalis*), eggplant (*Solanum malongena*), turnips (*Brassica rapa rapifera*), green beans (*Phaseolus vulgaris*), carrots (*Daucus carota*), and cauliflower (*Brassica oleracea botrytis*) on equal weight, dry matter (DM) basis[A,B]

Sample	Bile acid binding (μmol/100 mg DM)	Bile acid binding relative to cholestyramine, %
Okra	1.61 ± 0.04^{b}	15.9 ± 0.4^{b}
Beets	1.13 ± 0.02^{c}	11.2 ± 0.2^{c}
Asparagus	0.38 ± 0.02^{d}	3.7 ± 0.2^{d}
Eggplant	0.14 ± 0.01^{e}	1.3 ± 0.1^{e}
Turnips	0.10 ± 0.03^{e}	1.0 ± 0.3^{e}
Green beans	0.10 ± 0.03^{e}	1.0 ± 0.3^{e}
Carrots	0.07 ± 0.02^{e}	0.7 ± 0.2^{e}
Cauliflower	0.07 ± 0.01^{e}	0.6 ± 0.1^{e}
Cholestyramine	10.14 ± 0.09^{a}	100.0 ± 0.9^{a}
Cellulose	0.18 ± 0.02^{e}	1.8 ± 0.2^{e}

[A] Mean ± SEM within a column with different superscript letters differ significantly ($P \leq 0.05$), $n = 6$.
[B] The dry matter used for incubation was all the vegetables was 97–101 mg, cholestyramine and cellulose 24–26 mg.

My Note: The agricultural industry has been studying the real-life adverse health effects of mold biotoxins on animals for decades. There are numerous University studies looking at what binders are most effective for alleviating symptom in animals depending on the particular mold. Clay, charcoal, and zeolite were among the binders found to be helpful. In other words, when at all possible, use CSM or Whelchol but when that isn't possible, there are alternatives that likely won't work as well – see Biotoxin Journey – Alternative Binders.
http://biotoxinjourney.com/binders-2/#Alternative_Binders

In Vitro Binding Of Bile Acids By Okra, Beets, Asparagus, Eggplant, Turnips, Green Beans, Carrots, And Cauliflower
https://pubag.nal.usda.gov/pubag/downloadPDF.xhtml?id=671&content=PDF
Dried Okra Powder (100grams daily => $3.54/day)
https://www.afrofood.com/shop-by/dried-okra-powder/
Biotoxin Journey - Binders
http://biotoxinjourney.com/binders-2/

2. Soluble fiber 11g/day – critical to have daily bowel movements to eliminate bound up toxins
   Yerba Prima Soluble Fiber (10 capsules/day => 60 cents/day)
   https://amzn.to/2TMAcrX
3. Multivitamin and minerals – important as binders deplete nutrients
   Carlson Super-2-daily, Vitamins & Minerals (2 capsules/day => 65 cents/day)
   https://amzn.to/2DFnxjw
4. Oxbile 500mg daily – helps emulsify the toxin laden bile excreted by the gallbladder
5. N-acetylcysteine (NAC) 1,000mg 2 times daily to increase glutathione levels and support the liver. N-acetylcysteine (NAC) increases glutathione levels. Glutathione quenches free radical damage and plays a role in detoxifying heavy metals and other harmful substances. NAC is commonly used to support the liver. It also helps with Parkinson's disease, PTSD, depression, drug abuse, and fertility. NAC is safe and well tolerated.

- **MARCoNS** – stands for a staph infection deep in sinuses that profoundly damages health. Dr. Heyman says MARCoNS should only be treated after taking binders and successfully passing the VCS visual test. If MARCoNS are present, VIP won't help. In addition to the sinuses, MARCoNS are present in root canalled teeth, jaw cavitations, and joints.

  MARCoNS release a toxin called Palytoxin deep in the sinuses. This toxin travels through the olfactory bulb (sense of smell) and directly into the brain causing damage. Palytoxin is one of the most poisonous toxins known to man.

MARCoNS can be treated with BEG, BE, and silver nasal spray. Silver can take a long time – 6 months. Use two sprays in each nostril three times daily for 6 weeks. Don't use anti-fungals with the nasal spray. It's not required and causes Vancomycin resistance.

My Note: The approach of denying further treatment until being able to pass the VCS test comes across as being self-righteous. If a person with CIRS can't get out of their moldy environment right away, then they likely won't pass the VCS test even though they are taking binders and working to bring down inflammation. Practitioners should provide whatever support they can while making limitations in treatment clear. Who knows; if additional treatment is given, it may provide the mental clarity and energy needed to make the massive effort of cleaning belongings, discarding many possessions, and physically moving. It's the patient's decision, it's the patient's life, not the practitioner's.

Biotoxin Journey – MARCoNS
http://biotoxinjourney.com/marcons/

- **GI Health**
    1. IgG Food Allergy Testing – it's important to cut out inflammatory foods that just make matter worse
    2. Digestive Tract Testing – use testing to determine what supplements will heal the gut. Dr. Heyman noted that glutamine could be used at this point in treatment. Personally, I could only tolerate small amounts of glutamine without getting excess gas and bloating.
    3. Butyrate 3.6 grams twice daily - to lower inflammation and clear unhealthy Very Long Chain Fatty Acids (VLCFA).
       T.E. Neesby Butyrex – 1 capsule equals 1.2g of butyrate (23 cents/day)
       https://amzn.to/2thJfoW
    4. Moldy Foods to Avoid
        1. Alcohol including beer, wine, and hard liquor
        2. Wheat, oats, barley, rice, sorghum, and rye
        3. Peanuts, walnuts, and cashews
        4. Hard cheeses
        5. Mushrooms
        6. Apple juice, coffee, and chocolate
        7. Cottonseed oil
        8. Sugar (from sugar cane or beets)
        9. Tomato paste
        10. Beans
- **Metabolic Balance**
    1. Detox – four weeks
        - Ramp up detoxification using 3 grams of chlorella twice daily in order to start clearing other toxins like heavy metals and chemicals. May also use Clay, Okra.
        - Add in topical or liposomal glutathione
        - Work to bring up the pH of morning urine above 6.5 through diet, baking soda baths, etc. Note: Chlorella work well clearing PCBs.
          Neurobiologix . Glutathione Plus Topical $57/month (better-does not go through bad gut
          https://www.ovitaminpro.com/nbglutplustopical70.html
          Glutathione Force $60/month
          https://www.bulletproof.com/products/glutathione-force-90-ct
    2. Hormones
        - Use a urine or saliva hormone panel to evaluate reproductive hormones along with cortisol and DHEA patterns.

DUTCH Precision Analytical Hormone Test
https://mylabsforlife.com/lab-test/dutch-complete-precision-analytical-hormone-test-kit/

- Bioidentical Hormone Replacement Therapy (BHRT) to balance reproductive hormones - progesterone, estrogen, testosterone, etc. Alternatively, use natural supplements like Chasteberry, DIM, and Black Cohosh. In addition, supplement 25-50mg of DHEA when it is low. These are relatively high large amounts of DHEA, especially for women, but are needed in CIRS.
- When testosterone is low and estrogen is high, take the natural aromatase inhibitors Chrysin 500mg twice daily and Bilberry 6 grams once daily. Aromatase causes testosterone to be converted to estrogen.
- My notes on Chrysin/Bilberry/Butyrate/Myomin/Tongkat Ali below.

  Chrysin is a flavonoid used by bodybuilder to inhibit the enzyme aromatase. While chrysin inhibits aromatase in a Petri dish, my research does not show it working as a supplement.

  Bilberry has many health benefits besides inhibiting the conversion of testosterone into estrogen including being neuroprotective, treating chronic venous insufficiency, high blood pressure, improving vascular health, reducing stomach inflammation, helping vision, and treating diarrhea.

  Butyrate, a short-chain fatty acid found in foods and produce by the gut has epigenetic and protective qualities that help with inflammation including the gut, weight loss, blood sugar, brain cells, psychological disorders (upregulates hippocampus), liver, pancreas, and weight loss.

  Myomin inhibits aromatase thereby reducing estradiol along with increasing interferon (IFN) and interleukin 2 (IL-2). This helps with excessive estrogen, fibroid tumors, Polycystic Ovarian Syndrome (PCOS), fibrocystic breasts, weight loss, fibromyalgia, balance replacement hormones, prostate health, and immunity. Out of all the aromatase inhibitors I tried, Myomin worked best for me.
  https://amzn.to/2I8uzmt

  Tongkat Ali
  Source Naturals Tongkat Ali (on John Gray website)
  https://amzn.to/2UUuZyy
  SD-200 Tongkat Ali Extract $70/month (1gm daily recommended cycling 5days on and 5 days off)
  https://naturaltongkatali.com/what-you-must-know-before-buying-or-using-tongkat-ali-extract/
  Micro Ingredients 200:1 Long Jack powder $6/month
  https://amzn.to/2TQhnnu
  Stop Taking Testosterone And Just Make It
  <iframe src="https://player.vimeo.com/video/55666039" width="500" height="281" frameborder="0" allowfullscreen="allowfullscreen"></iframe>

3. Electrolytes and Water Balance
   - Imbalance between ADH and Osmolality can be addressed with Demopressin (DDAVP) that increases the production of ADH by the hypothalamus. In Biotoxin Journey - Step 6: ADH (Antidiuretic Hormone) – Osmolality, treating with DDAVP is not required unless the patient asks for it, as VIP will also correct this imbalance. Only need 7-9 doses at 0.2mg total taken every other night. Additionally, continue with 1.2 grams of Butyrate twice

daily.
https://biotoxinjourney.com/dhea-adh-adrenals-thyroid/#Step_6_ADH_Antidiuretic_Hormone_Osmolality

- **Resolution and Repair**
  Make sure to re-measure as markers can normalize by themselves.
  1. MMP9 –MMP9 over 332 can be treated with 400mg of Boswellia (at or above 25% boswellic acids) 3 times daily along with a no-amylose diet.
  2. C3a – C3a over 780 can be treated with 1,200mg of Red Yeast Rice twice daily along with 200mg of CoQ10 once daily.
  3. C4a – C4a over 2,830 can be treated with 2 grams of 3:2 fish oil along with SPMs (resolvins)
  4. TGF-beta 1 – TGF-beta 1 over 2,380 can be treated with 25-50mg of Losartan 2 times daily. Alternatively, 6 grams of Bilberry daily along with 1 gram of L-carnitine 2 times daily can be used. Note: Resveratol can be used instead of Bilberry.
  5. VIP – VIP under 26 pg/mL can be treated with Vasoactive Intestinal Peptide (VIP) nasal spray taken 4 times daily at 50mcg into each nostril. VIP spray heals the brain and calms the inflammatory genomic response. Can take up to 6 months before the patient feels better. Taper the dose over time while monitoring labs. Side effects like low blood pressure, stomach ache, rash, and depression (NMDA receptor activation) may be addressed by diluting VIP to 1:10 or even 1:100 and slowly increasing over time. Make sure to monitor Lipase levels to ensure the pancreas is OK.
     Biotoxin Journey – VIP
     http://biotoxinjourney.com/vip/

CIRS (Part 3) - Practical Tools For Treating Chronic Inflammatory Response Syndrome – May 2018
https://youtu.be/5UQuYBr0Mqs

- First and foremost, CIRS is inflammation of the nervous system – brain, autonomic, and peripheral nervous systems. CIRS stems from over-activation of the innate immune system.
- The gut, brain, and immune system are constantly talking to each other. It's important to address all three of these aspects when CIRS patients present with gut symptoms.
  - Leaky - low MSH
  - Food sensitivities -innate immune system along the gut lining is activated
  - Gastroparesis, gallbladder dyskinesia, motility disorders, constipation, alternating irritabl3e bowel syndrome, – autonomic system is impaired by inflamed gut nerves
- Heavy metals, chemicals, chronic infections such as root canalled teeth, affect who gets CIRS and to what degree.
- While detoxing heavy metals and chemicals is important, it should be done later on in the protocol. Otherwise, more inflamed patients, folks with tick disorders, seizures, psychosis, severe migraines, and so on, will get much worse.
- High Sed rates (ESR), high C-reactive protein (CRP), and auto-immunity are typically not seen in CIRS patients. Auto-immunity can occur in cases when dysregulation on the innate side of the immune system (high TGF-beta 1) causes spill over into the adaptive side of the immune system. When this happens, rheumatoid arthritis, lupus, and other auto-immunities can result.
- Entrocyte cells lining the gut, endothelium cells lining blood vessels, and the blood-brain barrier are all broken down by CIRS.
- There are numerous toxins that can cause CIRS - mold, dinoflagellates, Lyme, apicomplexans, cyanobacteria. Even though the instigating toxin may be different, the innate side of the immune system becomes stuck in overdrive resulting in a diverse but similar set of symptoms. Specific lab tests like TGF-beta 1, C4a, and the like make it clear if CIRS is the issue.
- Being symptomatic does not mean a person is still infected with a tick-borne disease or still being exposed to toxins. Their innate immune system may simply be stuck in overdrive.

- When 3 out of 6 of the markers are present, the person has CIRS.
    1. Fail VCS - http://biotoxinjourney.com/areyoumoldy/#Visual_VCS_Test
    2. Susceptible HLA haplotype - http://biotoxinjourney.com/deciphering-hla-dr-labs/
    3. High MMP9 - http://biotoxinjourney.com/aga-diet-detox/#MMP9_Leptin_Reset_8211_AGA
    4. ACTH/Cortisol imbalance - http://biotoxinjourney.com/dhea-adh-adrenals-thyroid/#ACTH_Adrenocorticotropic_Hormone_038_Cortisol
    5. ADH/Osmolality imbalance - http://biotoxinjourney.com/dhea-adh-adrenals-thyroid/#Step_6_ADH_Antidiuretic_Hormone_Osmolality
    6. Low MSH - http://biotoxinjourney.com/dhea-adh-adrenals-thyroid/#MSH_Melanocyte-Stimulating_Hormone
- Inability to exercise due to low VO2 max (oxygen capacity), excess heart pressure on the right side, pulmonary hypertension (high blood pressure), along with interstitial lung disease, and restrictive lung disease can result from CIRS.

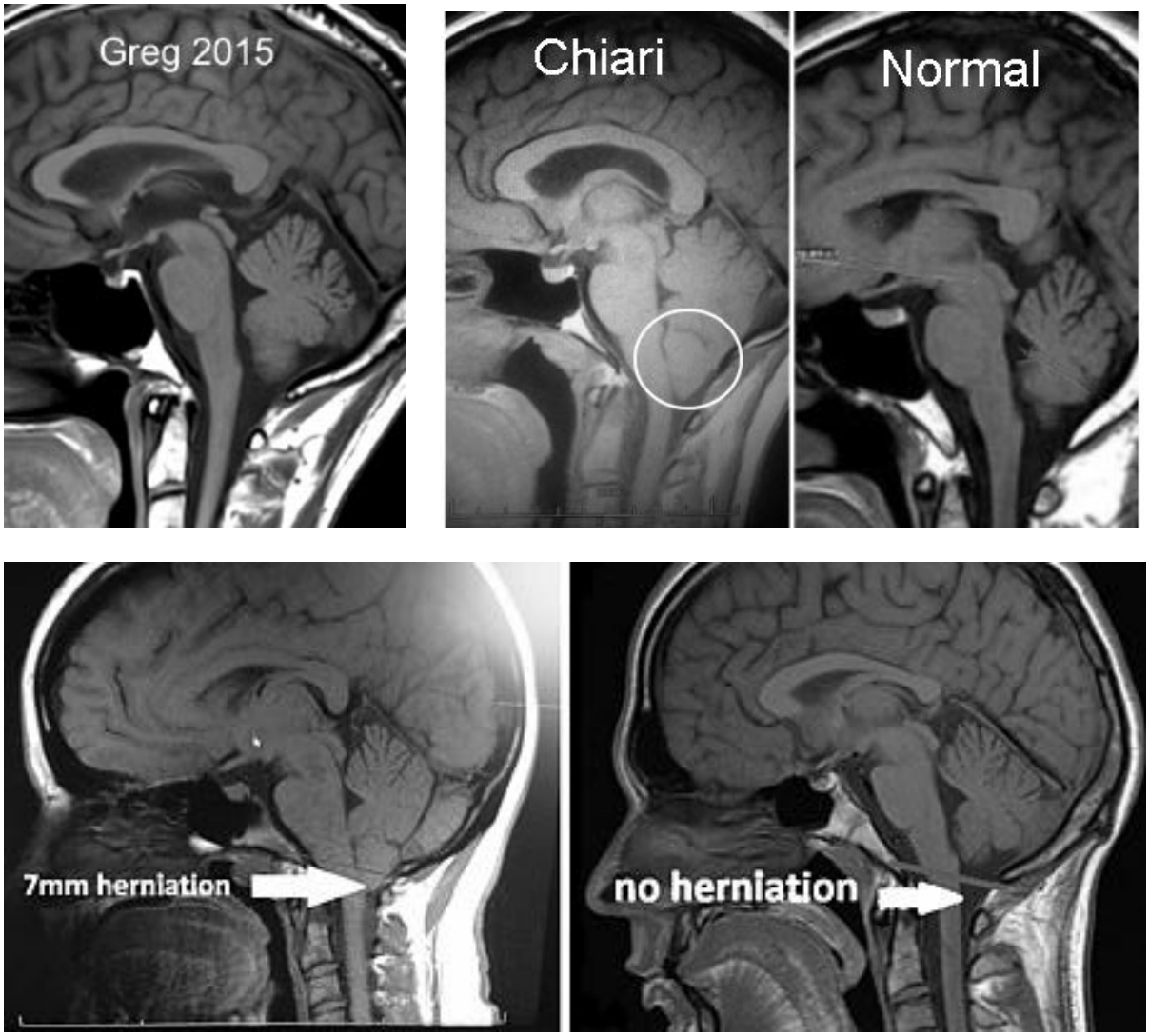
CIRS Symptom Clusters

Fatigue		Red Eyes Blurred Vision
Weakness Decreased assimilation of knowledge Aches Headache Light Sensitivity	Unusual skin sensitivity Tingling	Sweats (night) Mood Swings Ice-pick Pain
Memory Impairment Decreased Word Finding	Shortness of breath Sinus congestion	Abdominal Pain Diarrhea Numbness
Difficulty Concentrating	Cough Excessive thirst Confusion	Tearing Disorientation Metallic Taste
Joint Pain AM Stiffness Cramps	Appetite Swings Difficulty regulating body temperature Increased urination	Static Shocks Vertigo

Cluster table © R.Shoemaker

- There is over a 93% chance a person has CIRS if they have at least one symptom in 8 out of the 13 clusters shown.
- 10% of those with CIRS will pass the VCS test. Inability to pass the VCS test after treatment has started usually means the person is still being exposed to toxins.

- Raynaud's like symptoms (cold fingers or toes, skin color changes with cold, or numbness-prickly-stinging pain upon warming or stress relief) is a result of low capillary hypo-profusion due to low VEGF. CIRS is not a mitochondria dysfunction. The mitochondria aren't' working because they don't get enough oxygen.
  https://biotoxinjourney.com/what-is-biotoxin-illness/#The_Health_Effects_of_Biotoxin_Illness
- Low dose Naltrexone is occasionally helpful with CIRS patients because it can help with low endorphin levels (pain and love) due to low MSH.
- MSH levels must be normalized in order to heal the gut.
- Vertigo, light-headedness, and frequent urination are caused by an ADH to Osmolality imbalance.
- C4a in the 5,000 range typically means there was a mold exposure in the past but it is not ongoing.
- People with 11-3-52B haplotypes that have very high TGF-beta 1 often have connective tissue issues, dysautonomia, and mast cell activation. Connective tissue issues can be similar to those of Ehlers-Danlos along with Chiari Malformations in the brain, pelvic floor dysfunction, along with chiropractic adjustments not holding – need constant re-adjustments. Dysautonomia involves the autonomic nervous system resulting in symptoms such as fainting, cardiovascular issues, and breathing problems. It is linked to conditions such as Parkinson's disease and diabetes. They have more pain and somatic dysfunction (musculoskeletal, nervous, or lymphatic). Consequently, these people are very hard to treat. Note: I have a pair of 11-3-52B genes.



These are notes of Dr. Andrew Heyman's presentations on Chronic Inflammatory Response Syndrome (CIRS) courtesy of Biotxoin Journey. They are ***not*** complete or accurate. Do not propagated this material in violation of copyrights.

Chiari Malformation is a serious neurological condition where the bottom part of the brain, the cerebellum, descends out of the skull and crowds the spinal cord, putting pressure on both the brain and spine and causing many symptoms. https://christinaschiaricrusade.wordpress.com
https://www.conquerchiari.org/index.html
https://youtu.be/zuEji_VYKjQ

- C4a and C3a blood work must be sent to National Jewish Hospital. C3a is not the best indicator of a bacterial infection including Lyme.
- Video portion that succinctly explains CIRS
<div class='youtube_codegena' id='5UQuYBr0Mqs' data-params='?&theme=dark&autoplay=1&autohide=2&modestbranding=1&start=3034' src='http://biotoxinjourney.com/wp-content/uploads/2019/Heyman/Dr Heyman Pathway Video thumb.jpg'style='width:380px; height:215px;'>

- CIRS lowers T-regulatory cells resulting in an imbalance between TH-1 and TH-2 immunity along with higher TH-17 cells.
- People with low VIP often have a very high 25-hydroxy vitamin D levels and very low 125-hydroxy vitamin D levels. Vitamin D is generally not supplemented, as it will correct with VIP.
- Low vitamin D, cortisol, and testosterone will not rise with supplementation because the underlying driver is CIRS.
- Horses and dogs can get CIRS. For example, Equine Protozoal Myeloencephalitis (EPM) in horses is from CIRS.
- Candida is not the same as mold or being ill from mold. Cats claw, caprillic acid, mystatin, dyflucan do not treat CIRS caused by mold. Mold consists of many organisms while Candida is one specific type of fungus. Candida infections are linked to mercury toxicity.

Cadmium attaches to kidneys. 25:50

CIRS (Part 4) - Practical Tools For Treating Chronic Inflammatory Response Syndrome – May 2018
https://youtu.be/uvNtf1lSp1k

- NeuroQuant Mold Brain Volume Changes
  - Forebrain parenchyma increased
  - Cortical gray increased
  - Hippocampus increased
  - Pallidum increased
  - Caudate decreased
  - Cerebellum increased *
  - Thalamus and putamen normal *

- NeuroQuant Mold Scoring

Points	0	1	2
Forebrain	< 31.7	≥ 31.7	≥ 32.3
Cortical Gray	< 16.4	≥ 16.4	≥ 17.0
Hippocampus	< 0.28	≥ 0.28	≥ 0.30
Pallidum	> .066	≤ .066	≤ .071
Caudate	> 0.24	≤ 0.24	≤ 0.23

- NeuroQuant Lyme Brain Volume Changes
  - Thalamus increased
  - Cerebellum increased

- Forebrain decreased
- Putamen decreased
- Cortical gray, hippocampus, caudate normal *

- NeuroQuant Lyme Scoring

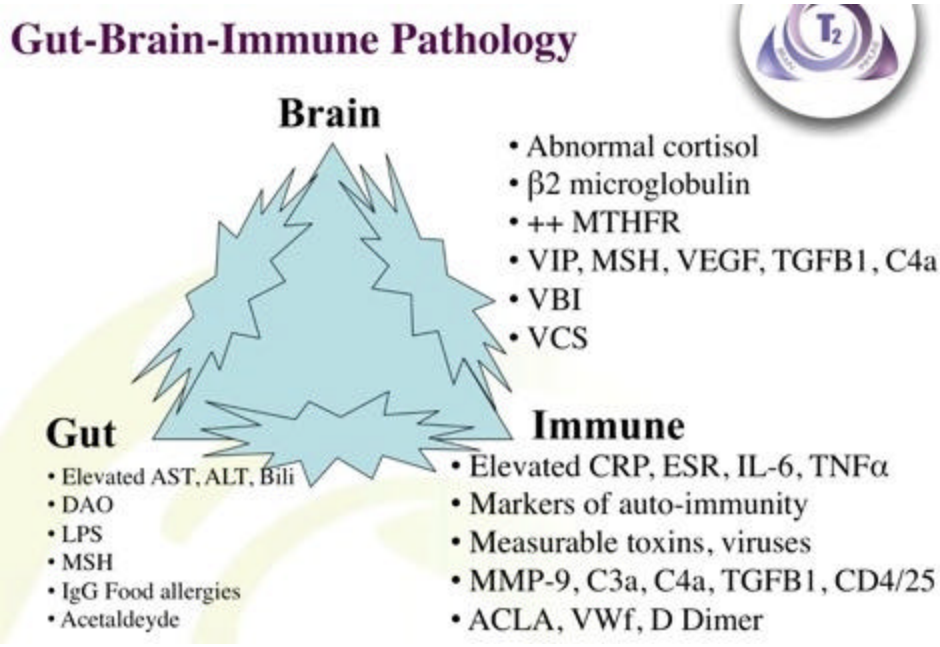
Points	0	1	2
Thalamus	< 0.55	≥ 0.55	≥ 0.56
Cerebellum	< 4.25	≥ 4.25	≥ 4.35
Forebrain	> 31.4	≤ 31.4	≤ 30.9
Putamen	> 0.345	≤ 0.345	≤ 0.335

Scoring: Add up the scores for each of the four volumes shown for the left and right side of the brain separately. If the total score for the left side, or the right side, are 5 or above, mold is an issue. Note: Only one side needs to be 5 or above.

- It typically takes between 2-6 months using VIP before patients feel better.
- The Illumina Next Generation Sequencer was used to look at gene expression. https://www.illumina.com/science/technology/next-generation-sequencing/sequencing-technology.html
- The Illumina was used to look at the RNA coming off the DNA (transcriptomics) – DNA expression.
- Cortisol levels rise in respond to illness/stress. While high cortisol is anti-inflammatory, it also cause damage. When cortisol is high, the immune system is TH-2 dominant, the gut lining, hippocampus, and tissue are degraded. In addition, MSH falls, mast cell activation causes the person to become more histaminic, and immunity weakens. Consequently, inflammatory markers like IL-6, TNF-alpha, and CRP tend to be normal when cortisol is high.
- Over time, the body responds to damage being cause by chronic illness/stress and subsequent high cortisol by intentionally lowering cortisol. When cortisol is low, the immune system is TH-1 dominant and the immune system is becomes unregulated. The person is more likely to have autoimmunity, high IL-6, TNF-alpha, and CRP.

  This state is not due to adrenal fatigue. The body is not only limiting damage from high cortisol, but is also directing available energy into the immune response. For example, given that CIRS patients are more likely to have chronic infections, the body is lowering cortisol to fight the infection. Trying to boast cortisol before treating CIRS can make matters worse because you end up suppress the immune response and thereby allow the pathogen to proliferate. So while low cortisol level has its own set of adverse effects, it may be best to wait on treatment using glandulars and the like.

  See the work of psychologist, Bruce McEwen.
  The Impacts of Stress on the Brain and Learning - Bruce McEwen Ph.D.
  https://youtu.be/9M-siizCB2Q
- Low cortisol make people are resistant to anti-depressants.
- Cortisol levels often rise on their own with successful treatment of CIRS.
- Gut inflammation triggers indoleamine to degrade tryptophan resulting in excess quinolinic acid and this is often seen on labs. Quinolinates are neurotoxic and levels are often high on CIRS urine tests (Genova Organic Acid).
  https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3686557/
- Heavy metals make CIRS worse. Heavy metal toxicity has a similar set of symptoms to CIRS.
- Chronic illness increases the risk for cancer.



- Gut-Brain-Immune Pathology is another way to organize CIRS pathology and related testing.

Triad 1 - Adrenals-Thyroid-Pancreas
https://youtu.be/XvLo8yV0gwg

For poor sleep, take 2 capsules of Neuromedulla glandular at night to re-activate the hypothalamus. 54:50 Neuro Medulla Complex 60ct Caps by Professional Formula
https://www.idealvitamins.com/products/neuro-medulla-complex-60ct-caps-by-professional-formulas

Dr. James LaValle
Recommended by Dr. Heyman
http://jimlavalle.com/

My notes on NR and Rg3 below.

Niagen - Nicotinamide Riboside (NR)

- Form of vitamin B3 (niacin) from cow's milk
- Speeds neurogenesis and prevents neuronal damage
- NR increases NAD+ levels resulting in improved nucleus and mitochondrial health
- ChromaDex makes raw NR under the trademark "Niagen"
- Niagen is sold and packaged by numerous companies - get pure Niagen
- Truniagen
  https://www.truniagen.com - $35/bottle/month
  https://www.amazon.com/TRU-NIAGEN-Advanced-Nicotinamide-Increases/dp/B01IMF8D2Q
- University of Colorado Boulder study published today indicates that when people consume a natural dietary supplement called nicotinomide riboside (NR) daily, it mimics caloric restriction, aka "CR," kick-starting the same key chemical pathways responsible for its health benefits
- 1 gm daily of NR raised Nicotinamide Adenine Dinucleotide (NAD+) by 60 percent
- NR is typically given as an oral supplement at doses of 250 – 500 mg daily (take sublingually)
- NAD+ levels rise proportionally to the dose
- Lowered blood pressure in stage 1 hypertension by about 10 points

- Chronic Nicotinamide Riboside Supplementation is Well-Tolerated and Elevates NAD+ in Healthy Middle-Aged And Older Adults
  https://www.nature.com/articles/s41467-018-03421-7
- Tends to increase ATP
- Hidden Vitamin in Milk Yields Remarkable Health Benefits
  https://news.weill.cornell.edu/news/2012/06/hidden-vitamin-in-milk-yields-remarkable-health-benefits
  "...researchers found that mice on a high-fat diet supplemented with NR gained significantly less weight (60 percent) than mice fed the same diet without NR, even though the mice supplemented with NR ate the same amount of food as mice on the high fat diet not treated with NR. They had improved energy. They were in better shape than the untreated mice, with significantly better endurance and stronger muscles. Additionally, none of the treated mice developed diabetes, as seen in the untreated mice on the high fat diet. And when fed a normal diet, NR treated mice had improved sensitivity to insulin. The NR treated mice also showed lower cholesterol levels. All of these benefits came without toxicity."
- Rats given 300 mg per kilogram of NR for a 3-week were 35 % *worse* in physical performance. Note: There are no known adverse side effects in human studies.
  https://jissn.biomedcentral.com/articles/10.1186/s12970-016-0143-x
- Novel NAD+ metabolomic technologies and their applications to Nicotinamide Riboside interventions by Samuel A.J. Trammell University of Iowa
  Together, the data suggest NR may be mainly metabolized through first pass metabolism by liver.
  https://ir.uiowa.edu/etd/3203/
- **Charles Brenner, PhD Discusses Nicotinamide Riboside**
  https://youtu.be/WItMH3PzIk4
    - NAD levels peak about 8 hours after taking NR. However, you do not need to dose NR throughout the day. Since NAD levels naturally peak once during the day and once during the night, at most, you could take NAD in the morning and then again before bed – particularly if you're taking higher doses.
    - NR can be taken with our without food.
    - Taking high amounts of NR may reduce folate levels.
    - In animal studies, NR boasts metabolism.
    - NR helps with metabolic stressors like insulin resistance, weight loss, prevention of diabetic neuropathy, and protection against noise induced hearing loss.
    - NAD is central to cellular bioenergenics, DNA repair, resistance to Reactive Oxygen damage, steroid synthesis, and so on.
- Additional NR Benefits
    - Boosts ATP and mitochondrial health
    - Reduces inflammation and oxidative stress
    - Anti-tumor and enhances DNA synthesis
    - Reprograms dysfunctional cells
    - Increase cognition and reduces Alzheimer's
- **How To Boost NAD, The Coenzyme of Life: Charles Brenner #491**
  https://blog.bulletproof.com/charles-brenner/
    - A 250mg dose will increase resiliency but typically won't be felt
    - 500mg in the morning and 500mg in the evening are more therapeutic
    - Dave didn't feel any improvement until 1 gram where it turned up his brain to 100%
    - Normally takes 2-3 weeks to notice improvement
    - Hair and fingernails grow faster
    - Recovery after workouts and air travel is quicker
    - Taking NR in the evening may help with sleep
    - Unlike B3 in the form of niacin, NR does not cause flushing
    - NR reduces hypertension (high blood pressure)
- Synapsin nasal spray is taken 3 months on followed by 2 weeks off.

- NR may be held under the tongue or mixed into a nasal spray (CRS Part 2 – Dr. Heyman 8:45)

Rg3

- Rg3 is a triterpene found in Panax Ginseng
- Panax Ginseng is also known as True Ginseng, Mountain Ginseng, and Wild Ginseng.
- Panax Ginseng is not the same as Siberian Ginseng, American Ginseng, Chinese Ginseng, or Pseudoginseng.
- One of a large family of bioactive ginsenoside compounds found in Panax Ginseng
- Protects the brain from oxidative damage and stimulates neurogenesis
- Decreased brain excitotoxic and oxidative stress results in better memory effects and less "brain fog"
- Reduces microglial activated inflammation and neuronal cell apoptosis in neurodegenerative conditions
- Stress initially causes the hippocampus to swell but prolonged exposure to adrenalin causes it to shrink. When this happens, the brain reduces cortisol levels to protect itself. Lower cortisol levels, due to prolonged stress, is common. The hippocampus converts short-term memory into long-term memory, and gives emotional "weight" to stored memories.
- The hippocampus can be repaired in as little as 2-4 weeks.
- Rg3 can be taken as an oral supplement or nasal spray
- Dr. Heyman is doing a study with veterans that take 5 mg twice daily, on an empty stomach***. Rg3 is cycled three months on followed by two weeks off.***
- HealthStore Rg3 100mg 60 capsules - 30 days $26
  http://www.supplementhealthstore.com/Rg3-100mg-60-Veg-Caps-details.php
- RG3 300- Ginsenosides $15/100mg Rg3
- https://www.amazon.com/RG3-300-Ginsenosides-Rg3-Enhanced/dp/B07C1Z6TVZ
- NuSci Panax Ginseng Extract Powder 10% Ginsenosides 1,000 250mg doses $26
  https://www.amazon.com/NuSci-Ginseng-Standardized-Ginsenosides-Vitality/dp/B00AVO3LLK
  https://www.ebay.com/itm/NuSci-Pure-Panax-Ginseng-Extract-Ginsenosides-powder-250g-8-8oz-Energy/231778413531
- Cancer Prevention and Therapeutics: Panax Ginseng
  http://www.altmedrev.com/archive/publications/9/3/259.pdf
  Panax ginseng apparently mitigates cancer through anti-inflammatory, antioxidant, and apoptotic mechanisms to influence gene expression. In Asia, the traditional preparations of fresh white and red ginseng have various concentrations of ginsenosides that develop in complexity with age and preparation.
    - *Classically, fresh ginseng is anything picked before four years of growth.*
    - *White ginseng (picked at 4-6 years) is peeled and then dried, and contains high concentrations of Rb1, Rb2, Rc, and Rd of the -diol group.*
    - *Red ginseng (harvested at 6 years) traverses both ginsenoside classes speaking to liberation of new constituents – Rh1, Rh2, and Rg3 – from steaming the dry whole root.*
    - *Key Ginsenosides: Rb1,Rb2, Rc, Rd, Rg3, Rh2, Re, Rf, Rg1, Rg2, Rh1*
    - *In recommended doses (1-2 g of the crude drug or 200-600 mg of standardized extracts – calculated to 4-7 percent ginsenosides), there are no known side effects of P. ginseng.*
        - *Hepatic Cancer - 37g/day (150lb person)*
        - *Ovarian Cancer - 110mg/day (150lb person)*
        - *Gastric Cancer - 4.5g/day*
        - *Colon Cancer - 340mg/day (150lb person)*

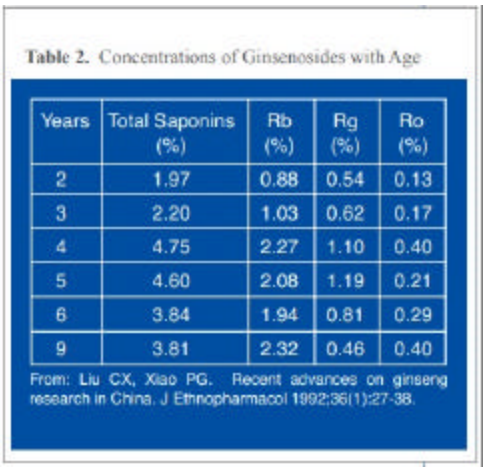


Table 2. Concentrations of Ginsenosides with Age

Years	Total Saponins (%)	Rb (%)	Rg (%)	Ro (%)
2	1.97	0.88	0.54	0.13
3	2.20	1.03	0.62	0.17
4	4.75	2.27	1.10	0.40
5	4.60	2.08	1.19	0.21
6	3.84	1.94	0.81	0.29
9	3.81	2.32	0.46	0.40

From: Liu CX, Xiao PG. Recent advances on ginseng research in China. J Ethnopharmacol 1992;36(1):27-38.

- Panax ginseng
  https://examine.com/supplements/panax-ginseng/
  Panax Ginseng tends to be taken in doses of 200 to 400mg daily for general 'preventative' medicine, although some studies on the inclusion of Panax Ginseng in a multivitamin suggest doses as low as 40mg might be bioactive. The 400mg dose appears to confer most cognitive benefit. These doses refer to standard 'Ginseng Extract' which is around 2-3% total Ginsenosides, and is a once daily dosage.

  Trials using Korean Red Ginseng extract for erectile health and libido enhancement tend to use 3g of total Korean Red Ginseng (fermented panax ginseng) extract daily, in three doses of 1000mg.
    - Cognitive function (e.g., memory, focus, attention, and intelligence) and brain health.
    - Antioxidant and Anti-inflammatory
    - Allergies and Immunity
    - Mood
    - Muscle Gain and Exercise
    - Energy and Stimulation
    - Men's Health
    - Testosterone Boosting
    - Libido and Sexual Health
- Nasal spray is taken 3 months on followed by 2 weeks off.
- My Note: Given the above, an amount less than 0.5% of Panax Ginseng is Rg3. Using 0.5%, 1 gram of Panax Ginseng contains 5mg of Rg3. Taking 500mg-1g grams daily seems reasonable.

Synapsin

Synapsin is an innovative, patent-pending powder blend of ginsenoside Rg3 and nicotinamide riboside along with ingredients to aid in solubilization and dispersion. It is designed to be used in formulations for the support of neurological health and cognitive support. Synapsin was invented by renowned author, pharmacist and functional medicine speaker Jim LaValle, RPh, CCN, ND, and is commonly used in combination with methylcobalamin or hydroxocobalamin in formulations to support neuronal function and cognition.
Nasal spray is taken 3 months on followed by 2 weeks off. Spray contains 2mg Rg3 and 2mg NR. Can take a month before seeing benefits.
https://tccompound.com/product/synapsin/