

NEW PARADIGMS FOR LYME BORRELIOSIS COMPLEX:

THE BEST OF EAST AND WEST

The Emergence of 21st Century Acquired Immune Deficiencies and Innovative Solutions

JOSEPH G. JEMSEK MD, FACP

IM/ID-BC, HIV-AIDS/Lyme Specialist November 19th 2017





I appreciate the opportunity for allowing me to address you today.



JOSEPH G. JEMSEK, MD, FACP, AAHIVS



- Received M.D. from University of Illinois, 1974
- 23+ Years Background in HIV/AIDS Treatment and Research through 2006
- Novel for experience in HIV/AIDS and Lyme Borreliosis
- Fully dedicated to the treatment of tick-borne illnesses since 2001





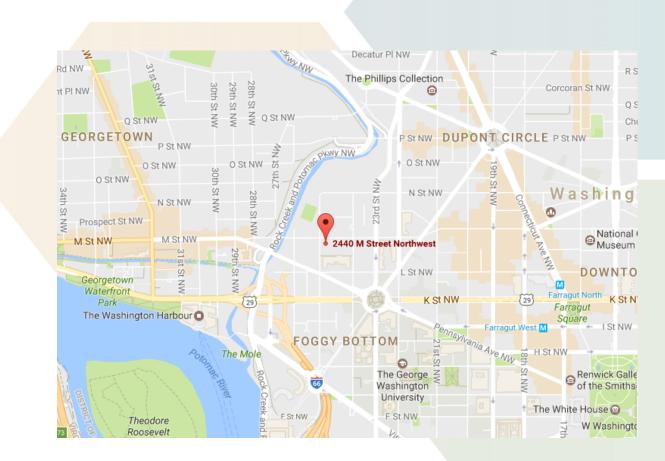


Washington, D.C. Based Practice

2440 M Street NW -- 2 Blocks from Georgetown

- Founded in the year 2009
- Treating/Treated Patients From Every State in the U.S. and over 30 Countries to date
- Assists with Travel and Housing Services for both Domestic and International Patients
- Treats around 5,000 active patients and has treated over 15,000 patients to date.

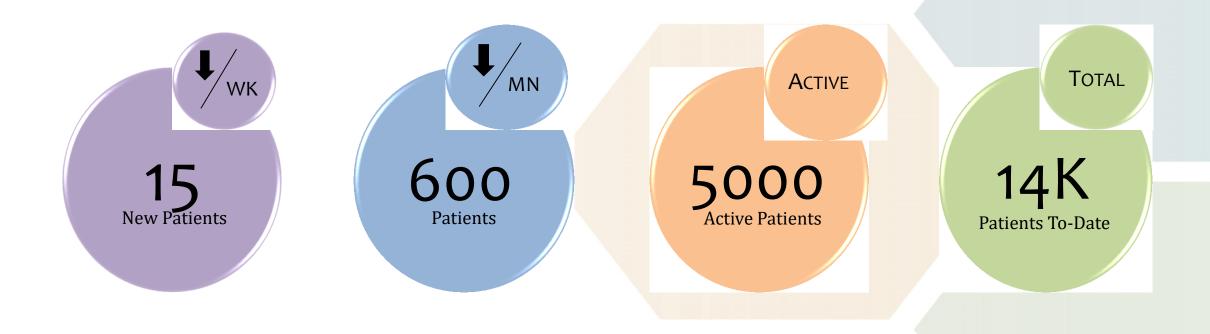
A destination practice for the treatment of Lyme Disease and other tick-borne illnesses













- ▶ Board Certified Infectious Disease M.D.
- ► Administration (2)
- ▶ Physician Assistants (2)
- ▶ Registered Nurse Practioners (4)
- ► Scheduler (2)

- ► Medical Assistants (6)
- Triage (4)
- ▶ IV Nurse (3)
- ▶ Research Division (3)
- ▶ Medical Records (2)



"Everything I have learned...
truly learned... in the practice of
medicine, I have learned from my
patients."

Joseph G. Jemsek MD, FACP







The #1 Vector-Borne Disease in the Entire Northern Hemisphere

▶ Global Phenomenon

The United States of America Canada Netherlands Spain

Austria France Sweden Scotland

Belgium Italy Denmark Brazil

Germany Switzerland Greece Czech Republic

Ireland Norway Hungary United Kingdom

The Agent of Infection – Borrelia Burgdorferi Sensu Lato
 – an extensive pathogenic subgroup of Borrelia species

 Transmitted through the bite of hard-backed ticks although research suggests there may be other modes of transmission Reports of *Borrelia sp.* in over

80

countries around the Globe



What is Lyme Disease: A CDC Diagnosis

"A systemic, tick-borne disease with protean manifestations, including dermatologic, rheumatologic, neurologic, and cardiac abnormalities. The most common clinical marker for the disease is erythema migrans (EM), the initial skin lesion that occurs in 60%-80% of patients."



- Centers for Disease Control (CDC) Accepted 2017 Case Definition



- Musculoskeletal System Recurrent brief attacks of objective joint swelling in one or few joints
- Nervous System signs that cannot be explained by any other etiology
- Cardiovascular System Acute onset of high-grade atrioventricular conduction defects







What is Lyme Disease: A Working Case Definition

"Chronic, relapsing, or otherwise 'unexplained' encephalopathy, arthritic symptoms, and neuropathy generally associated with tick-borne infections, spearheaded by *Borrelia burgdorferi* in combination with co-infecting organisms."



-Joseph G. Jemsek MD, FACP





Lyme Borreliosis Complex: A Working Case Definition

Chronic, Relapsing, and Otherwise "Unexplained"

- **I. ENCEPHALOPATHY** One or more of the following Sx:
 - Inflammatory, as in headache
 - Sleep disturbances
 - Mood alterations
 - Cognitive changes

II. ARTHRITIC and Periarticular Symptoms

- inflammatory and non-inflammatory Enthesopathy
- Generally migratory
- Overlap with several rheumatologic syndromes

III. POLYNEUROPATHY / MONONEURITIS MULTIPLEX

- Sensory commonly associated with neuropathic pain (c fiber)
- Cord- myelitis and other syndromes
- Ganglionitis/Plexitis
- Motor neuron disease





Lyme Borreliosis Complex: A Working Case Definition

Plausible minor criteria - examples

I. ATYPICAL RASH OR FLUSHING

- -Erythema chronicum migrans (EM) compatible rash
- -Acrodermatitis chronica atrophicans (ACA) compatible

II. SUPPORTING SEROLOGY, TESTS, AND/OR DIAGNOSTICS

- -Western Blot
- -PCR Test
- -ELISA Enzyme linked immunosorbent assay
- -Immunoblot

III.SUGGESTIVE NUTRIENT OR COFACTOR DEFICIENCIES

- -Ferritin
- -Vitamin D
- -Hormonal Axis'







▶ 'Complex' reflects:

- Polymicrobial infection (Multiple co-pathogens, e.g. Bartonella spp., Babesia spp., HGE, HME)
- Multi-systemic disease (Tropism)
- Multi-compartmental neurologic disease (Tropism)
- Immune-evasive and immunosuppressive (Unique survival mechanisms, including Bb capacity for altered life forms, biofilm issues, etc)

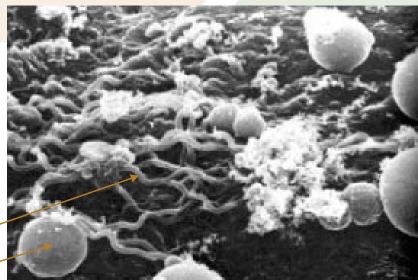






- ► Multiple life forms of *B. burgdorferi* (*Pleomorphism*)
 - Spirochete
 - Blebs and vesicles
 - L-form
 - Cyst
- ► May survive intracellularly, extracellularly, or in body fluids & tissues
- ► Multi-systemic, has been isolated from:
 - Synovial Fluid, Skin, CSF, Brain, Blood, Muscle,
 Lymphatic tissues, Heart, Kidney, Splenic Tissues





spirochete

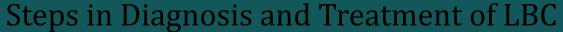
cyst



Bb and co-infections may cause vicious cycle of ongoing inflammation:

► Characterized by :

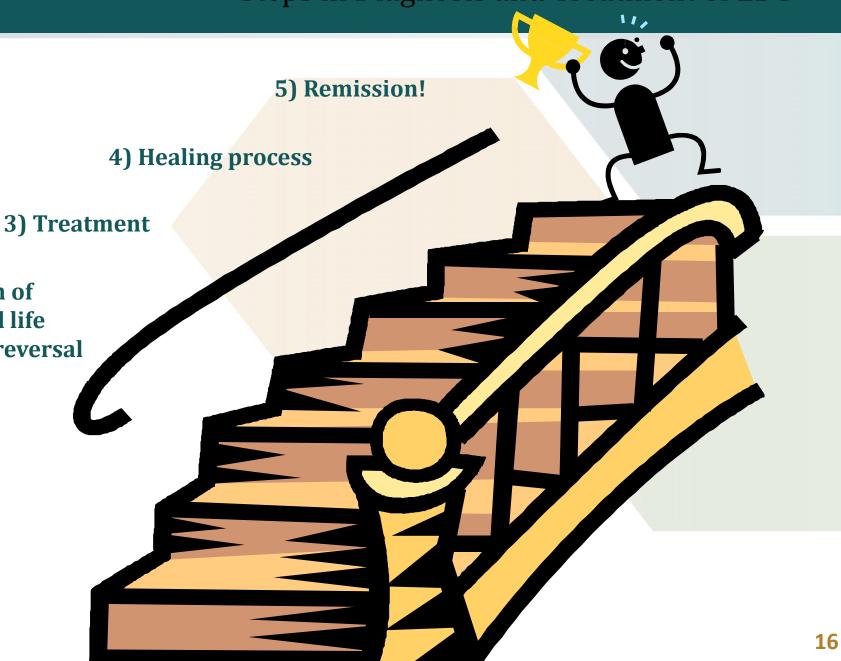
- Multi-compartmental neuropathology
- Multisystemic involvement
- Immune evasion, immune exhaustion and immunosuppression
- Biofilm formation
- Lipoprotein as an engine for exaggerated immunoreactivity (Herxheimer effect)
 much occurring in the CNS and PNS
- Chronic oxidative stress via chronic inflammation





2) Stabilization of faulty essential life functions and reversal of stressors

1) Evaluation, interpretation, and prioritization of major pathological processes based on clinical and laboratory evaluations





Treatment of LBC is focused on Neuro-Immune Restoration and Cellular Recovery



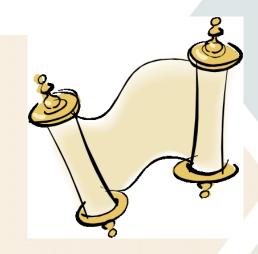
▶ Restoration of Essential Life Functions (ELF) by:

- Antibiotic/Antimicrobial Therapy
- Addressing Metabolic derangements
- Reduction of Oxidative Stress and Inflammatory
 Radicals
- Mitochondrial Support and restoration of vitality
- Restoration of cellular membrane Integrity
- Neuro-rehabilitation





Restore Essential Life Functions





 $\mathbf{P} \rightarrow \mathbf{Pain}$

0 → Others: Social Support / Co-morbidities

 $\mathbf{E} \rightarrow \mathbf{Endocrine/Metabolic}$

M → Mood/Psychiatric

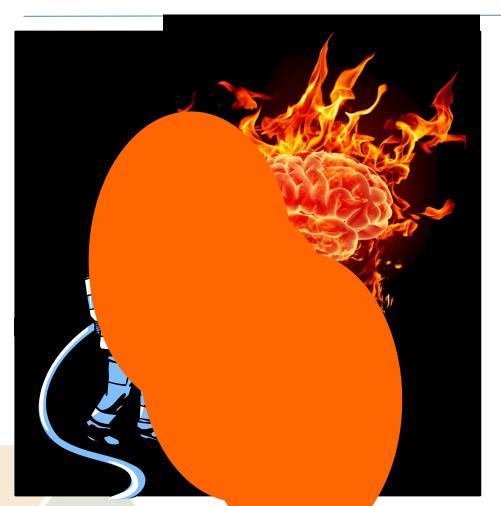
 $S \rightarrow Sleep$



Challenges in the Inflammatory Storm

Predominance in the Central and Peripheral Nervous System

A basic approach to detoxification or tissue relief



- Restrict the introduction of provocative compounds or toxins (Dietary Changes)
- Administration of exogenous antioxidants + Increased mitochondrial support
- 3. Sudation Therapy (Sauna, Exercise, Soaks)



CHARACTERISTICS & SUPPORTIVE THERAPIES FOR PAIN

Characteristics

- ► Neurogenic/Nociceptive/CRPS
- ► Musculoskeletal [N]
- ► Headache [N&N]
- ► Impact of Fatigue [All]
- ▶ Positional, Body habitus, Occupational [All]
- ▶ Often Multifactorial

<u>Support</u>

- ► Neurotrophic Medication Combinations & Analgesics
- ► Nutraceuticals
- Physical Therapy
- ► Transcutaneous Nerve Electrical Stimulation (TCNS)
- ► A Trial of Acupuncture
- ► Neurocognitive Feedback



POEMS: OTHER CONSIDERATIONS

- **▶** Persisting co-morbid conditions
 - Proper management of other existing medical conditions comorbid conditions
- ► Encouragement and support outside of clinical setting
 - Family and social support





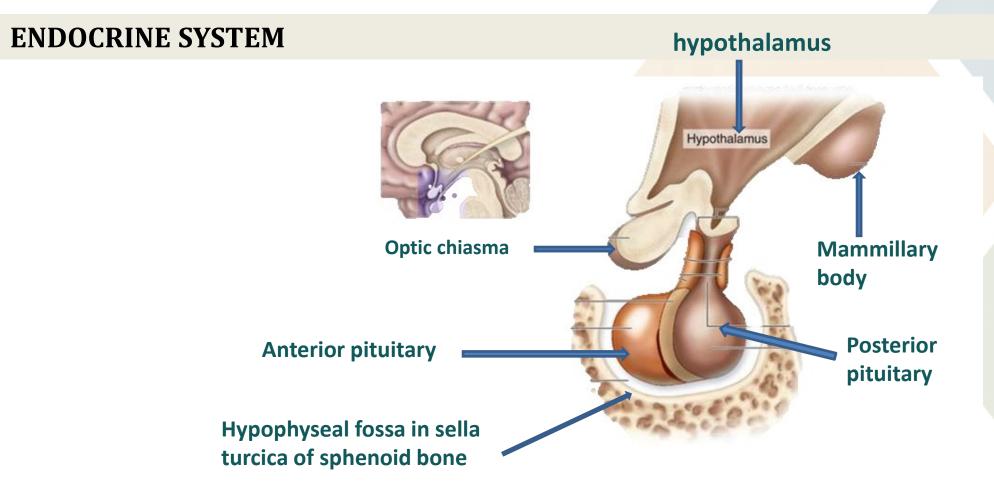
POEMS: ENDOCRINE SYSTEM

► Endocrine disorders are a common finding in LBC patients, presumably due to high levels of infection/inflammation in HPA axis (highly vascular)

- ► Infection may affect neuroendocrine cells by
 - Direct lesion/inflammation
 - Oxidative stress
 - Feedback effect of chronic inflammatory state
 - Pain, Sleep disruption and psychological distress
 - All resulting to elevation or suppression of hormonal secretion





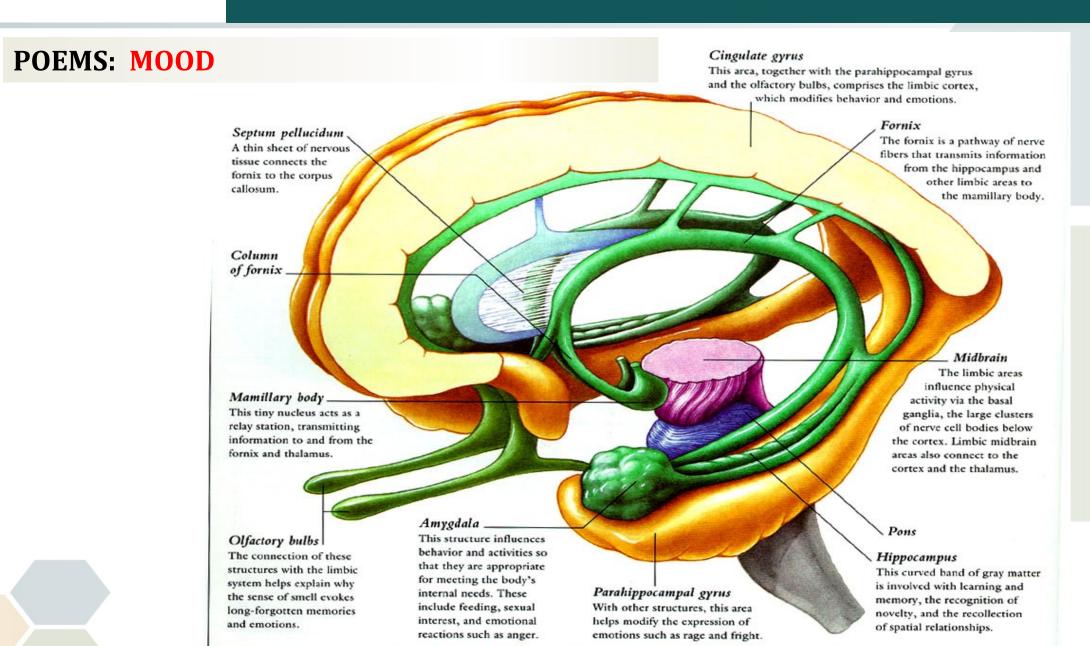


Hypothalamus-Pituitary Axis (HPA)

The brain, via the hypothalamus, controls endocrine functioning in the body.



Understanding POE[M]S





Understanding POE[M]S



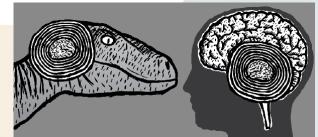




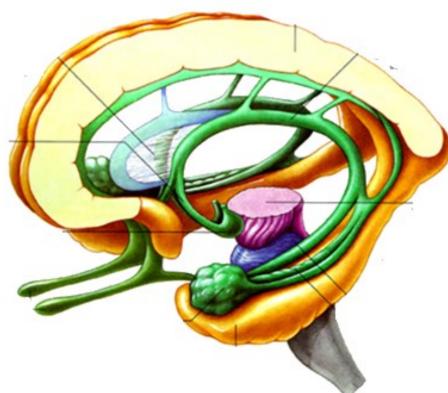
Understanding POE[M]S

- ► The limbic system is the center of the LBC storm
- ▶ Think White Matter!





- Heightened startle
- Unprovoked crying/giggling-('ge seizures')
- Uncharacteristic
- personality changes
- Rage, paranoia
- Hypervigilance
- Emotional lability
- Insomnia, dysomnia



- Pain
- Cravings
- ADD/ADHD
- Tremor
- Bruxism
- Photophobia, phonophobia, osmophobia
- Vibrations
- Hallucinations





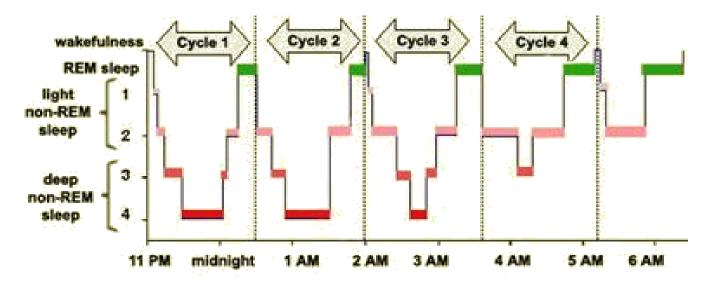


THE SLEEP CYCLE

The brain remains active in REM Sleep while the body muscles rest in a relaxed state of atony. The function of the REM sleep therefore is to rest the body.

In Non-REM sleep, the brain activity and metabolism significantly decreases (>50%) especially in deep sleep characterized by Delta waves, while muscles regain tone.

Therefore the function of the Non-REM (DELTA) is to rest the brain... This is immuno-restorative.





SUPPORTIVE THERAPIES FOR SLEEP

Life Style Adjustments

- ► Good Sleep Hygiene
- ▶ No Stimulant close to bed time
- ▶ No Screen time before bedtime
- ► Healthy Bed time rituals to facilitate sleep (patient specific)
- ▶ Delta Wave Inducement
- ► Selective Inducers (Meds for Delta Sleep)

Nutraceuticals

- ► Melatonin
- ► GABA
- ▶ 5HTP
- ► Valerian Root
- ► Chamomile Tea (Sleepy Time Tea)







Recognize possible presence of:

- ► Gut Dysbioisis
- ► Refractory POEMS
- ► Methylation Pathways Defects
- ► Mitochondrial Defects
- ► Subacute cholecystitis
- ▶ Biofilm/CCSVI
- **▶** Coinfection Recrudescence
 - Babesiosis

- ► Paradoxical Drug Reactions
- Heavy Metal Toxicity, GMOs and
 Other Environmental Neurotoxins
- Motor Neuron Predominant Presentation (ALS Equivalence)
- ► Peri-menstrual Volatility
- ► Unresolved Comorbidities



"Every science touches art at some point- Every art has its scientific side. The worst man of science is he who is never an artist, and the worst artist is he who is never a man of science."

- Armand Trousseau (1869)

Lectures on Clinical Medicine

"The practice of clinical medicine with its daily judgments is both science and art. In the practice of clinical medicine, the art is not merely part of the 'medical humanities' but is integrated to medicine as an applied science."

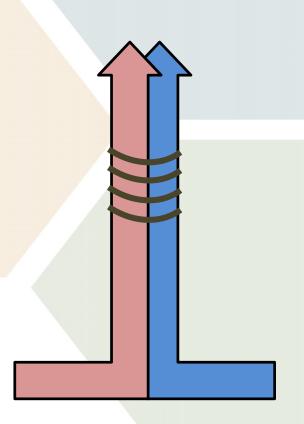
- John Saunders (2000)

The practice of clinical medicine as an art and as a science. The Western Journal of Medicine. 2001 Feb; 174(2): 137–141.



- Lyme Borreliosis Complex is a Multi-systemic, Multipathogenic disease that is spearheaded by the 'great imitator' that is Lyme Borreliosis.
- ► Treatment must encompass the patient as a whole (Holistic and Individualized Protocol).
- ▶ Proper management involves a fine application of the science and art of medicine.

Achieved through a genuine application of Western and Eastern practices.





The Need for Integration of Eastern & Western Medicine

- ► All medicine based on science has some degree of empirical support
- ► Apothecaries' investigation of chemical ingredients of herbs is the **precursor of modern pharmacology**.
- ► Proper application and integration of TCM and Modern medicine provides a holistic support to health and recovery.
- Encourages compliance to and maintenance of healthy lifestyle
- ▶ Limits dependency and addiction on certain pharmaceuticals
- Provides a multifaceted approach
- ▶ Understanding the interaction of drugs, Pharma to Herbal and Herbal to herbal interaction within ones scope of practice is essential.
- ► There is benefit to **open exchange of knowledge and ideas** between Eastern and Western Medicine



Ideal Priorities and Goals of Western Medicine

Focused on **Correction of Diseased States**

Expectations of Relief and Immediate improvement

Emphasizes the **Science of Medicine**

- ► A thorough Health and Physical Examination
- Medical History
- Diagnostics
- ► Medication: Pharmaceuticals
- ► Nutritional Support and Supplements
- Surgery
- ► Lifestyle Adjustments
- Physiotherapy



► Antibiotic Therapy and Approach

- Chronic Illness
- Multi-Trophic, Pleomorphic Organisms
- Complex conditions compounded by Immuno-modulation/suppression (Tuberculosis)
- Multiple Pathogenic Species Involved in Pathogenesis
- Localized/Systemic Dysbiosis leading to Exacerbated Conditions

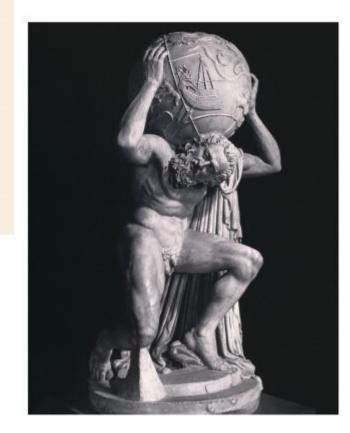
▶ Genetic Counseling

- Sensitivities
- Predisposition
- Prophylactic Response [Accounting for Genetic Predilection]
- **▶** Dietary Protocols and detoxification cleanses



Antibiotic Therapy

- ► Supportive therapy and exogenous antioxidants are no longer able to maintain homeostasis due to degree of immune dysfunction and oxidative stress
- Antibiotics reliably reduce spirochetal and co-infections load
- ► Steady and progressive killing of the pathogen gradually expands expressive clonal T-cells functions
- ▶ Use of antibiotics does not preclude strict application of healthy life style
- ► Goal is to limit use of antimicrobials which occasionally be may not necessary





- ► Route of Antibiotic Administration determined by multiple factors-
 - Formulation (IV vs. Oral)
 - Tolerance
 - Drug-drug Interaction
 - Optimal route for bioavailability to diseased tissue (CSF penetration, Limited GI absorption issues etc.)
- ► Assist floundering, dysfunctional immune system
 - Effectively levels the "playing field"
- ► Important to continue to manage stressors during Treatment...e.g. nutritional, psychiatric, hormonal, life adjustments on Rx, sleep, pain, seizures
 - "We don't treat many chronic illnesses with one drug" JGJ '07





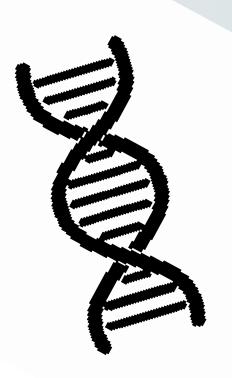
- ▶ Bb has multiple strains, life forms & locations
- Synergizing co-infections ALWAYS present in LBC
- ► Genomically replete microbial pathogens capable of immune evasion, immunosuppression and antimicrobial resistance
- No practical retrieval and strain/species definition of pathogens, and no practical or reliable antimicrobial sensitivity testing
- ► Slow replication characteristics of all targeted pathogens (allows for pulse approach in therapy)
- ► Combination Rx limits resistance
- ► Combination treatment based theoretical models and physician's experience
- ▶ Rest periods or treatment holidays allows for cellular repair and detoxification



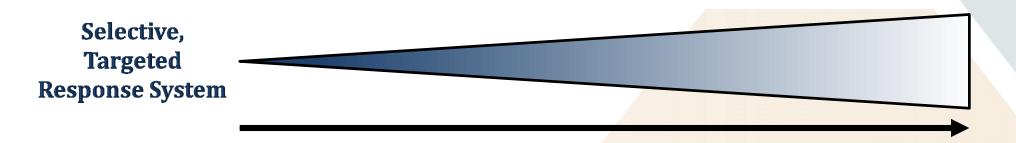
Genetic Counseling – A Prophylactic Protocol and Sa

Genetic counseling is fairly recent phenomena that revolves around identifying various markers in the DNA to gain insight into particular conditions or susceptibility to conditions that allows physicians to better adjust appropriate health and lifestyle options.

- ► Insight into predisposed conditions
- Evaluation of efficiency of various cellular processes (homo-/hetero-zygosity)
- ► Advanced prophylactic gauge to lifestyle changes based on predisposed conditions
 - Also application in health options when choosing appropriate treatment regimens.







Generalized, Holistic Prophylactic System

Conventional Western Medicine focuses on pinpoint precision tactics to immobilize, disrupt or kill targeted microbes

There are however, ramifications to a western approach to treatment, in particular antibiotics usage:

- Antibiotics can lead to a condition of dysbiosis, with a particular predilection for the gut.
 - > Dysbiosis in itself may lead to a cyclical reaction that compounds on itself with or without further antibiotic or environmental exposure.
- Conventional therapy may lead to rapid cellular and mitochondrial oxidative stress state that disrupts ATP generation and cellular processes.
- ➤ Therapy does not account for 'cellular and microbial debris' that may cause a reaction with the host immune system, typically in the form of inflammation.
- Therapy may disrupt the natural 'rhythm' that allows the body to effectively modulate and regulate systems without the need for outside support. (SSRIs)



DYSBIOSIS

Disorder in the normal microbial distribution/quotient in the digestive system resulting to negative health symptoms

- Harmful coexistence of Host & Microflora
- Damage to the intestinal epithelium (leaky gut) -->Gut wall thickening and reduced nutrient resorption
- Weakening of the Immune System
- Unprocessed Antigen and Allergen exposure: Increases food sensitivity and non-specific immune reactions.

- Increase Histamine and other Biogenic Amine production through bacterial decarboxylation.
- Increased gas production (H2S, NH3, CH4, CO2)
- Acceleration of cell turnover increased energy need
- Vitamin deficiencies



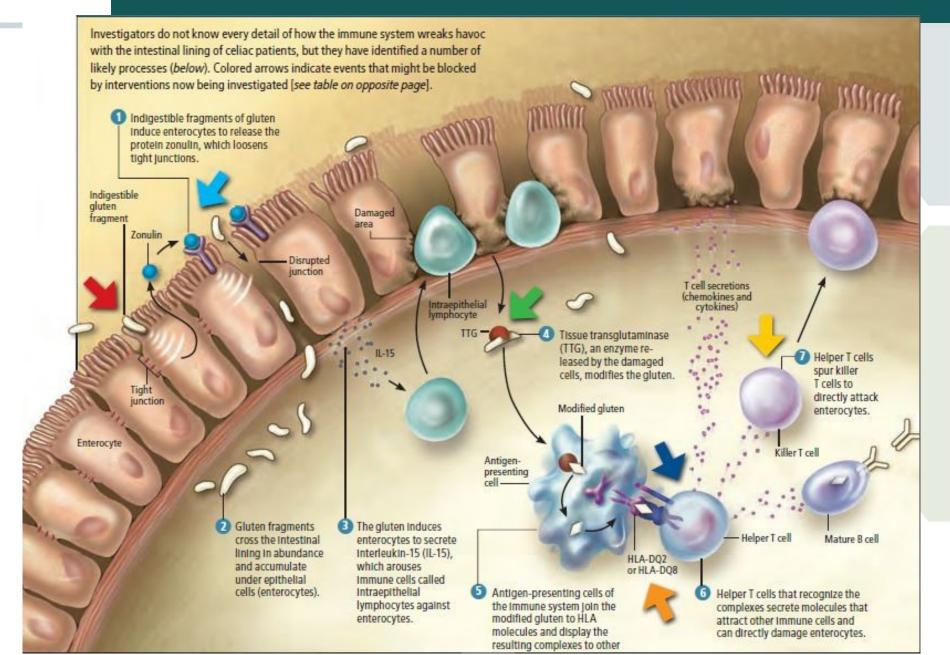
Dysbiosis increases bacteria species capable of Amino Acid decarboxylation which produces Biogenic Amines in the gut

- ► histidine to histamine
- ▶ tyrosine to tyramine
- ▶ lysine to cadaverine
- ornithine to putrescine
- ▶ arginine to agmatine
- ► tryptophan to tryptamine

- ▶ 5-HTP to serotonin
- L-DOPA to dopamine
- ▶ glutamic acid to GABA
- ▶ serine to ethanolamine
- phenylalanine to phenylethylamine



Sensitivity to Gluten and other Food Products





- ► Identify Aggravating Factors
 - Antibiotics, gluten, biogenic amines, poor/inappropriate diet, etc
- ► Remove/control offending agents
- ► Control offending microbial & including yeast overgrowth
- ▶ Promote Adhesins (i.e. *Lauric Acid*)
- ▶ Re-inoculate the gut with beneficial microbes



► Repair mucosal lining

- SCFA
- L-Glutamine
- Use with L-Glutamine with caution in patient with MSG and/or glutamate sensitivity or Hepatic encephalopathy

► Reinoculate the gut with beneficial microbes

- Probiotics: rotational use of different beneficial strain to ensure diversification and avoid overgrowth
- Most ethnicities /cultures has a form of fermented/probiotic food
- Careful use of probiotics in immunocompromised patient
- **Prebiotics**: non-digestible soluble fibers used to enhance beneficial microbial growth which include insulin, fructooligosaccharides and galactooligosacharides.
- Prebiotics only after few weeks on probiotics



Insight into Therapeutic Eastern Medicine: Restoring Eubiosis

Kefir

Acidic, slightly alcoholic, fermented and naturally carbonated products which is formed by a culturing kefiran or kefir grains in milk, coconut water or sugar water.

 The Kefirans/kefir grains are fibrillar materials composed largely of water insoluble polysaccharide-protein matrix which contain and are formed by the complex microbial mixture of Lactic Acid Bacteria, Yeasts and acetic acid bacteria living symbiotically within the matrix.



Biological Activity and Beneficial Effects

- Kefir itself acts against a number of pathogenic bacteria such as Salmonella, Helicobacter, Shigella and many more...
- Important biological activities that have been demonstrated:
- Antitumoral
- Anti-inflammatory
- Antimicrobial
- Immunoregulatory

- > Anti-allergenic
- Antidiabetic
- Antimutagenic
- Antigenotoxic



- ▶ Histamine is generally a by-product of the fermentation process (Probiotics and Kefir)
- ► Histamine production is limited to bacterial strains which have the hdcA gene.
- ► Sulfites are commonly added to fermented products (wine) to inhibit histamine production
- ► Sensitivity to fermented products are usually due to histamine content
- ▶ Utilize Probiotics with Non-Histamine producers (lack hdcA gene) and/or Histamine degrading strains to limit reactions to Probiotics



Ideal Priorities and Goals of Eastern Medicine

- ► Emphasizes the **Art of Medicine**
- ▶ Focused on Health Maintenance
- Proper evaluation of the individual being (A holistic approach)
- Capitalizes on the ability of the body to achieve self-healing
- ► Healing considered as a gradual process
- ▶ Mechanism of actions cannot always be translated or rationalized to fit the Western Paradigm.
- ▶ All medicine based on science has some degree of **empirical support**.

Overview of Commonly Used Traditional Therapies

► Herbal Medication and Supplementation

- Artemisinin
- Enula
- Pinella
- Burbur
- Chlorella
- Curcumin

► Complementary and Alternative Medicine (CAM) Therapy

- Acupuncture
- Salting, Soaks, and Footbaths
- Meditation
- Sudation
- Low Intensity Exercise
- Physical Therapy





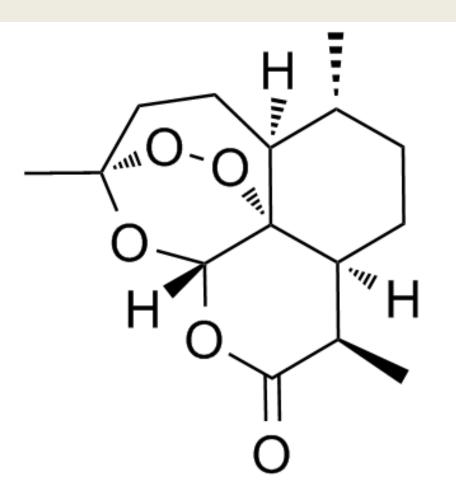
Herbal Therapy and Supplementation

- Important to ensure proper integration and compatibility with current medication.
- Pharmacotherapeutic knowledge of selected herbs is important as interaction is possible with combination therapy
- Synergism with current western medication, side effect amelioration and antagonistic effect can be put to good use.
- Enhance efficacy of antibiotics and other medications



Artemisinin (Qinghao su)

- Extracted from *Artemesia annua* (Sweet wormwood, sweet annie, or annual wormwood)
- Arthemesia annua documented medicinal usage since 168BC Qinghao, China
- Low side effect profile
- Active compound Dihydroartemisinin (DHA)





Artemisinin

Active compound Dihydroartemisinin (DHA)

- Inhibits nucleic acid/protein synthesis at erythrocytic stage via endoperoxide moiety in apicomplexia parasites which include Babesia (Babesiosis) and Plasmodium (Malaria)
- Also effective in Schiztosomes (schistosomiasis)
- Derivatives include Arthesunate, Artemeter and used in combination therapies





Enula (Inula Helenium)

Elecampane root Extract . contains 2 major components -

- Inulin: a polysaccharide most often used as a prebiotic.
- Helenin: a mix of phytochemicals made up of sesquiterpenoids (3 Isoprene units + a lactone ring) including alantolactone and Isolactolactone, Stearoptene.
- **Alantolactones** have antimicrobial, antifungal, and antiinflammatory properties
- Artemisinin (DHA) and its derivatives are also a sesquiterpene lactone and will likely have an additive/synergistic effect with Enula.





Curcumin



- Active ingredient in spice turmeric (> 5000 published studies)
- Inhibits NF-KB activation resulting in a down regulation of multiple inflammatory genes .
- Potent antioxidant with anti-inflammatory and neuro-protective properties.
- Fe2+ chelator (avoid use with anticoagulant and in anemias)



Pinella

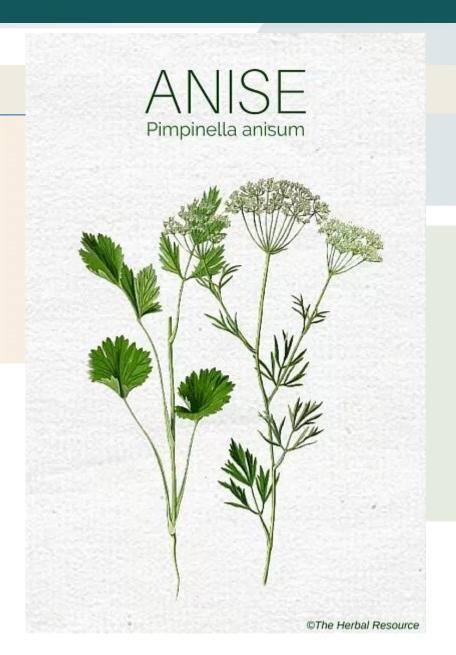
Pimpinella anisum, commonly known as Anise.

Pinella is an extract of the 'bark' of *P. anisum* is considered one of the oldest medicinal plants with traditional use stemming from:

➤ Mexico ➤ Spain

> West Asia > Mediterranean Basin

Traditionally, the seeds of the plant (aniseeds) are used as flavorings, digestive aids, carminative and for relief of gastrointestinal spasms.





Antibacterial and Antifungal Effects

• Showed **activity against most tested pathogens** in vitro, namely: *M. leteus, S. aureus, B. cereus, and P. vulgaris*

Anticonvulsant Effect

 Increases threshold of clonic seizures as seen in mouse models after being exposed to pentylenetetrazole and electric shock.

Anti-Inflammatory Effects

- Significant analgesic effect similar to morphine and aspirin
- Suggested that effect is comparable to 100mg/kg of aspirin, or 10mg/kg of morphine

Antioxidant Activity

- Strong scavenging activity against nitric oxide, super oxides, hydrogen peroxide and DDPH.
- Reported Metal chelating activities

Effects on Gastrointestinal System

- Palliation of Nausea
- Significant reduction of gastric mucosal damage induced by necrotizing agents.

Muscle Relaxation

 Bronchodilatory effects due to inhibitory effects on muscarinic receptors



Burbur

Desmodium molliculum, commonly known as Burbur.

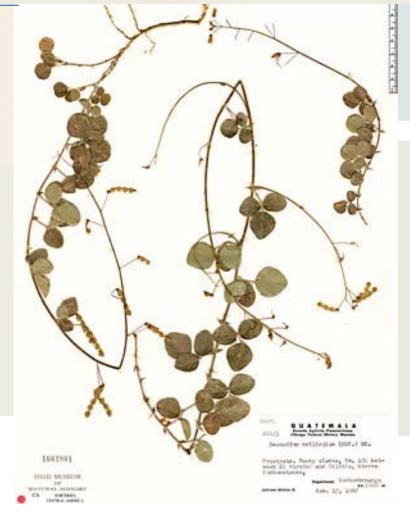
The *Desmodium* genus is a highly studied medicinal herb dominated by multiple therapeutic species.

Pharmacological Properties of Burbur:

Antioxidant Activity

- Strong presence of phenolic compounds
- Showcased highest DPPH radical scavenging activity when compared against 14 other medicinal herbs and fodder material.

Literature from Peru suggest that it is commonly used by herbal doctors, in conjunction with *E. bogotense*, as an anti-inflammatory 'cocktail' agent during cancer treatment.



Least studied herbal supplement in this list





Chlorella is a genus of single-celled **green algae** made up of a number of species.

One of the most common species utilized in nutrition today is *C. vulgaris*.

Nutritional Properties of Chlorella:

A Multi-Functional Dietary Supplement:

- Rich in Omega-3 polyunsaturated fatty acids
- High Protein Content
- Great source of Vitamins and Minerals
- Notable polysaccharides

Proven Antioxidant Capacity

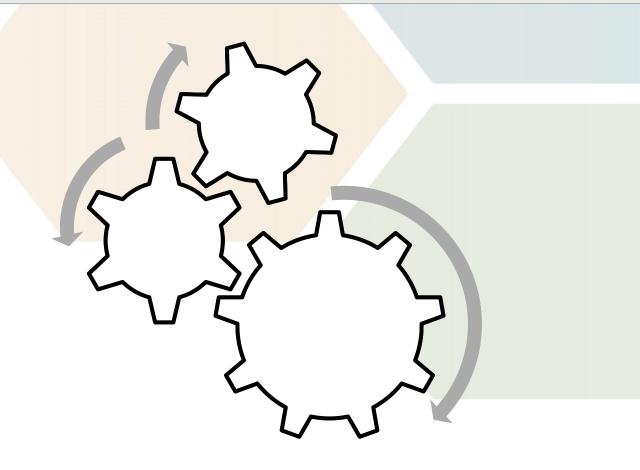
- Active phenolic compounds, chelation, and preventative radical formation properties
- Attenuates lipid peroxidation





Complementary and Alternative Medicine

- > Acupuncture
- ➤ Salting, Soaks, and Footbaths
- > Meditation
- > Sudation
- ➤ Low Intensity Exercise Training
- Physical Therapy



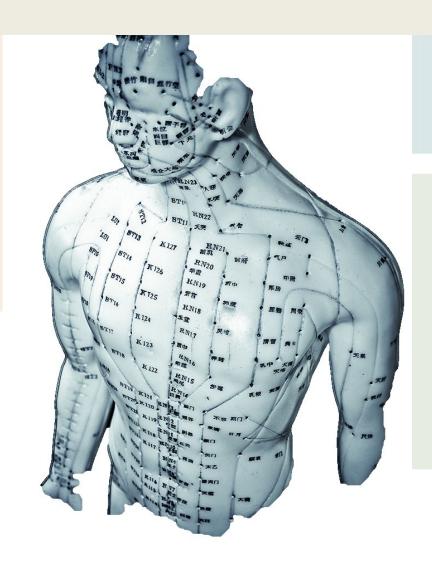


Acupuncture (c. 100 BC)

Believed to be first discussed in the scripture:

Huangdi Neijing [Esoteric Scripture of the Yellow Emperor]

- ► Practice commonly associated with oriental medicine that focuses on the flow of qi, a kind of energy.
- ► The concepts and mechanisms that regulate 'qi' are **not understood precisely** but scientific and anecdotal evidence suggest prominent therapeutic remediation.
- ► The stimulation elicits a composite feeling known as 'deqi'; this feeling and sensation may not be felt by patients or employed by acupuncturist
- ► There are proposed theories or suggestions as to why and how acupuncture provides both immediate and prolonged pain reduction:
 - 1. Endogenous Opioid Peptides
 - 2. Diffusion noxious inhibitory controls





Diffusion noxious inhibitory controls (DNICs)

A proposed mechanism for **immediate** relief

The **DNIC system** is responsible for pain diffusion. Understood in a way as if you were to hit your shin on a low table then were to start rubbing it over to ease the pain, generally not rubbing at the point of impact.

- ▶ "Distraction Effect"
- ▶ DNIC is activated when noxious stimuli are applied to any part of the body, distant from the excitatory receptive field
- ► The stronger the conditioned stimuli, the more powerful the inhibitory effects, which are followed by long-lasting post-stimulus effects.
- ▶ DNIC triggered specifically by the activation of peripheral receptors who signals are carried by $A\delta$ and C-fibers.

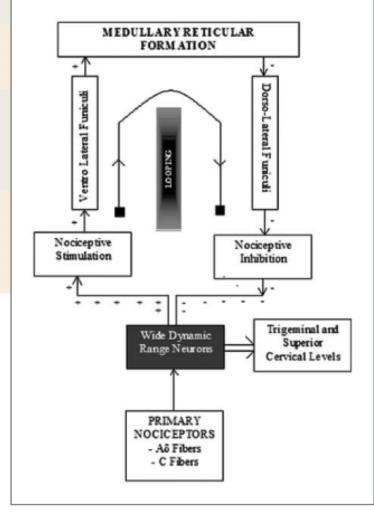


Fig 3. Diffuse noxious inhibitory controls (DNIC). Inhibitory bulbospinal pathways: (+) Stimulation, (-) Inhibition.

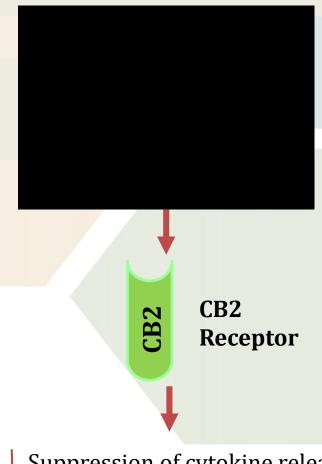


Endogenous Opioid Peptides

A proposed mechanism for **prolonged** relief

Acupuncture, specifically electroacupuncture, induces the release of endogenous opioids from lymphocytes, monocytes and granulocytes via activation of sympathetic nerve fibers (SNF).

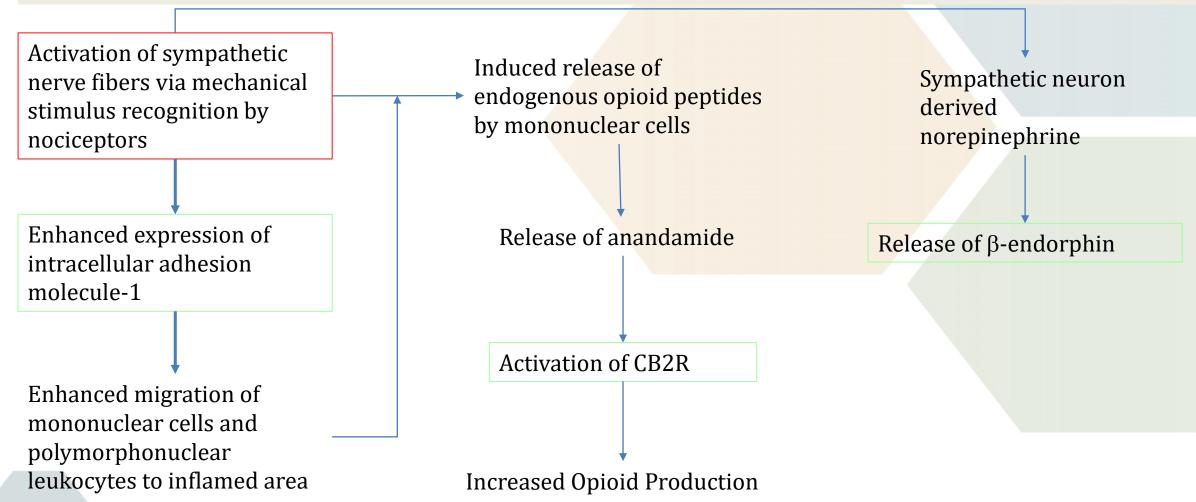
- Activation of SNFs enhances the expression of intercellular adhesion molecule-1 in the blood vessels which promotes the migration of leukocytes to the site of inflammation.
- ► Electroacupuncture mitigates pain by upregulating endogenous ananamide, which activates cannabinoid CB2 receptors to promote opioid production and concurrently blocks cytokine release to inhibit pain.
- ► Manual acupuncture suppress high-intensity stimulation-evoked field excitatory postsynaptic potentials in the anterior cingulate cortex (ACC)



- ↓ Suppression of cytokine release
- Increased Opioid Production
- Decrease in visceral pain



Endogenous Opioid Peptides (Simple)

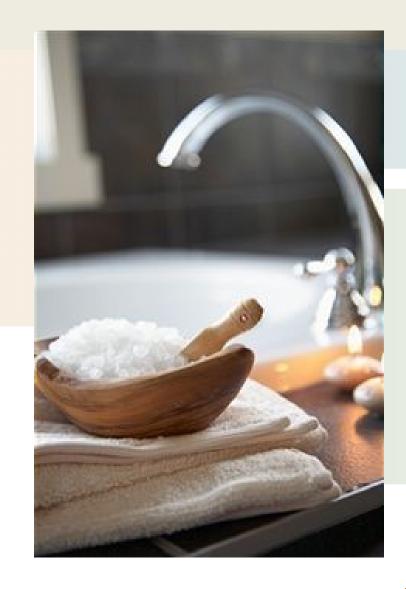




Salting, Salt Baths and Foot Soaks

Transdermal salting, in particular salt baths, efficacy and mechanism of action is contended with little research to support any claims.

- ► There are two common held beliefs surrounding the therapeutic nature and efficacy of Salt (Epsom) Water bathing:
 - 1. Placebo-effect induced by warm water
 - 2. Mg and SO₄²· Ions pass through skin barrier
- Magnesium is considered the primary component that is passed through the skin barrier for use that provides relief during salt baths and foot soaks by increasing blood circulation through modulating muscle and nerve function.
- ► A recent review article (2017) posted in *Nutrients* by **Gröber et al.** reviewed available literature and studies focusing on the proposed mechanisms of action and clinical clarity in application, however **little/no evidence-based data was available.**



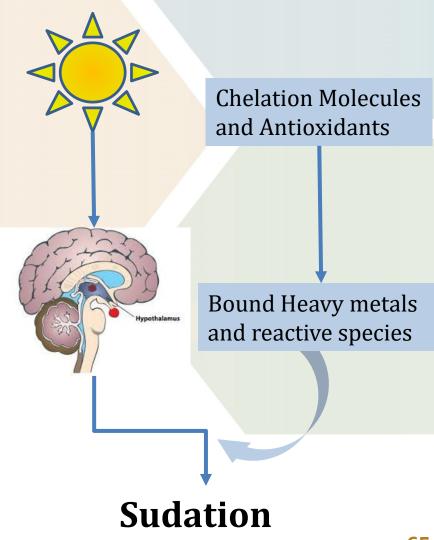


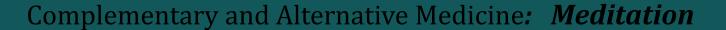
Theories for Sudatory Detoxification Mechanisms

- Increased thermal load activates heat-loss mechanisms via the stimulation of temperature receptors which pass **impulses via Aδ** and C fibers to the CNS, in particular the Hypothalamus [ANS].
- ► Sweat glands are triggered sympathetically by sympathetic C fibers which **releases acetylcholine**, which consequently bind to M3 muscarinic receptors of the eccrine glands, triggering sweat production.

Dietary Antioxidants and Heavy Metal Chelation

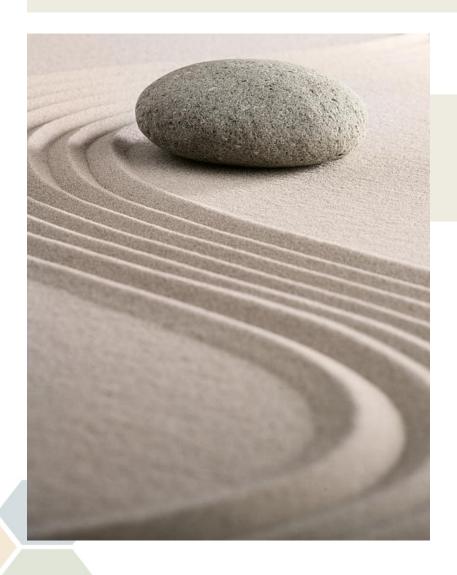
- ► **Thiol-containing (-SH)** molecules from dietary sources serve as heavy metal detoxicants i.e. α -Lipoic acid
- ▶ It is believed these molecules with bound metals, may be excreted in sweat (and urine) eliminating traces of heavy metal minerals from the body.







Meditation



The practice of meditation comes in many forms. It is believed to have been used in practice since 5000BCE.

Focus is on training of attention and awareness in order to bring mental processes under greater voluntary control and thereby foster general mental well-being and development and/or specific capacities

- ► Calm, clarity, and concentration
- Stress and anxiety reduction
- ▶ Reduction of depressive symptoms
- ▶ Pain attenuation
- ► Employed in developing self control and treatment of drug addiction/ dependence
- ► Changes neural activities in the brain



Low Intensity Exercise Training Regimen

- ▶ Research has indicated that low-intensity exercise programs for patients with chronic illnesses proves to be beneficial in a number of different ways:
 - Physical Activity (even at low intensity) can upregulate monoamine neurotransmitters in the brain, as well as endorphins.
 - ➤ Patients with chronic illnesses experienced an increase in mitochondrial density which led to improvement in oxidative capacity in skeletal muscles.
 - Catalase levels are highest in highly oxidative muscle fibers and lowest in muscles with low oxidative capacity.
 - ➤ Glutathione Peroxidase (GPX) increases in skeletal muscle in an exercise intensity-dependent manner.
 - Physical activity appears to "re-regulate" the hypothalamo-pituitary adrenal (HPA) axis



Endogenous
Antioxidant Activity
and Concentration

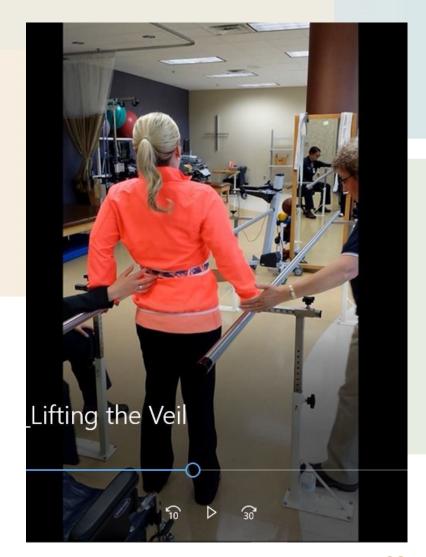
Mitochondrial Density

Upregulates Release of β-Endorphins and Monoamine Neurotransmitters



Adjunct Physical Therapy in LBC Treatment

- Neuronal Insult in LBC may lead to limited or loss of function and independence: a significant contributor to diminished quality of life
- ▶ Rehabilitation an integral component of holistic care
- ► Helps maintain optimal level of functioning
- Maintain and improve mobility, symptoms and QOL
- ► Manage refractory pain, fatigue and de-conditioning from poorer health status





The Integration of Modern and Traditional Techniques

Highlights	Challenges
 Potential synergistic effect between modalities to bring about a certain outcome (i.e. antibacterial effects) Increased efficacy of either modality due to effects or mechanisms of action of the other Compounded protocol that incumbents precision and holistic/whole-body remediation Proper application may dramatically increase patients perceived quality of life through antioxidative and pain-relieving modes of action. 	 Adverse effects through not-well understood mechanisms of action Potential decrease in efficacy of either modality Potential production of insoluble by-products through cross-reaction Strength and dosing with herbal products is less of a science and more an art. The effects differ between patients and there is no clear regulation.



Setting Up a Standard for Integration

When properly employed, the integration of Eastern and Western Medicine can appropriately cover the shortcomings of the other while carefully meshing the workings of a highly targeted, selective therapy with a holistic, prophylactic approach that synergizes and/or covers the damage dealt by the other.

- ➤ Identify your targets
- ➤ Utilize diagnostic methods to ensure exposure
- > Explore your options
- ➤ Know your interactions

- Know your patient
- > Consult others when necessary
- Rationalize and expect treatment outcomes
- Modulate therapy, as necessary, against outcomes





"The greatest enemy of knowledge, is not ignorance but the illusion of knowledge"

Stephen Hawking



Thank You for Attending





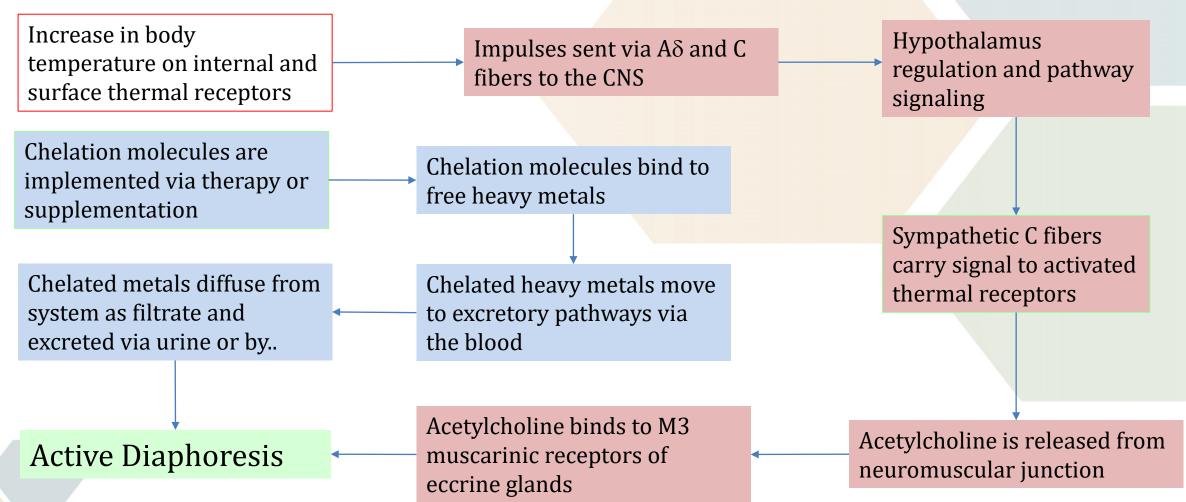
Supplementary Material







A Theory for Integrative Chelation Sudation



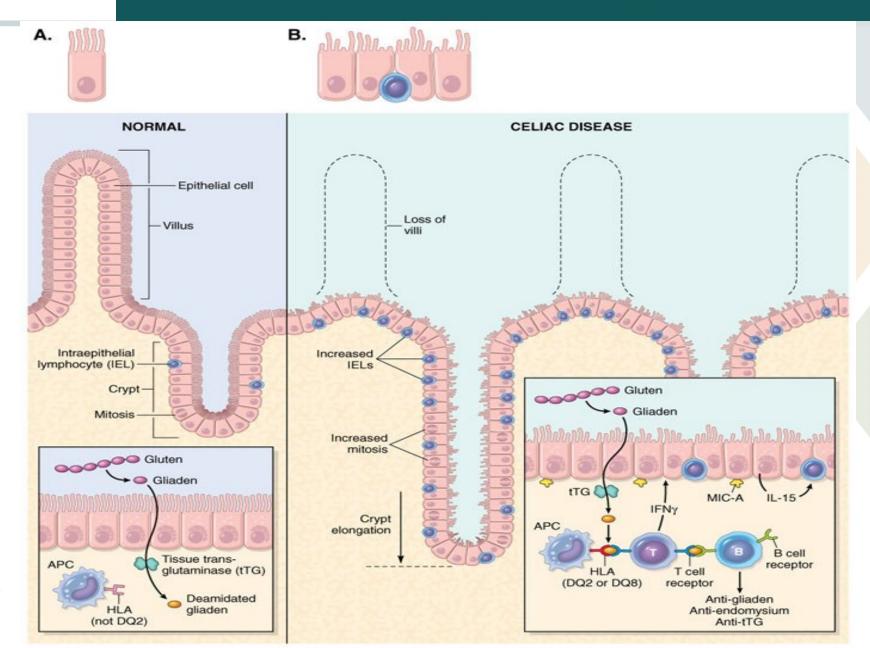


EUBIOSIS: Symbiotic coexistence of Host and Microflora

- ► The GI microbiota plays a critical physiologic role and functions akin to a body organ
- ► Healthy gut resists infection: protects mucosa against invading organisms
- ▶ Immune surveillance, stimulation and maturation
- ► Enhanced GI motility and function
- ▶ Digestion and Metabolism of plant compounds, xenobiotics and bile acids
- Synthesis of Vitamins (K and B vitamins), short chain fatty acids and polyamines
- Better tolerance to antibiotic treatment

In Treatment of Lyme Borreliosis anticipate DYSBIOSIS







▶ Gluten Grain

Food products made with Wheat, Rye, Barley

▶ Non Gluten

 Food products made with corn, potato, rice, soybeans, tapioca, arrowroot, carob, buckwheat, millet, amaranth, quinoa etc

Vinegar

- Malt vingar contains gluten
- Distilled white vinegar does not contain gluten



► HIDDEN GLUTEN

- Hydrolyzed Vegetable Protein (HVP) / Vegetable Protein unless from soy or corn
- Flour or Cereal unless made with pure rice flour, corm flour, potato flour soy flour
- Modified food Starch other than arrowroot, corn, potato, tapioca, waxy maize
- **Vegetable Gum** other than carob bean gum, locust bean gum cellulose gum, guar, gum aracia, gum tragacanth, xanthan gum or vegetable starch
- Soy Sauce or Soy Sauce Solid unless specifically stated

► GLUTEN WATCHWORDS

• Stabilizer, Starch, Flavouring, Emulsifier, Hydrolyzed, Plant protein



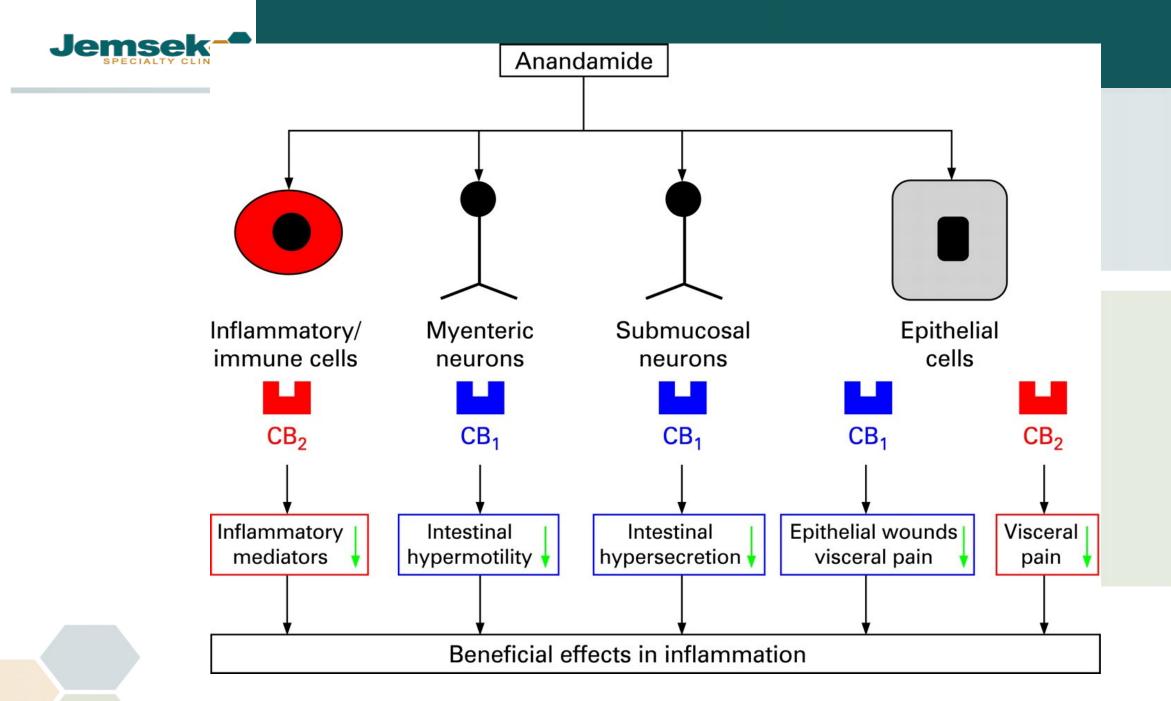
► Cocktail 2

- Probiotics prior to rifaximin treatment (continue rifaximin through treatment and afterwards)
- ► L-Ornithine phenylacetate
- ► Magnesium and Potassium Aspartate + Taurine Supplement
- ▶ Ubiquinol (CoQ10) 300mg daily
- ► Acetyl-l-carnithine 500mg daily
- Adequate and balanced nutrition to prevent catabolic state.

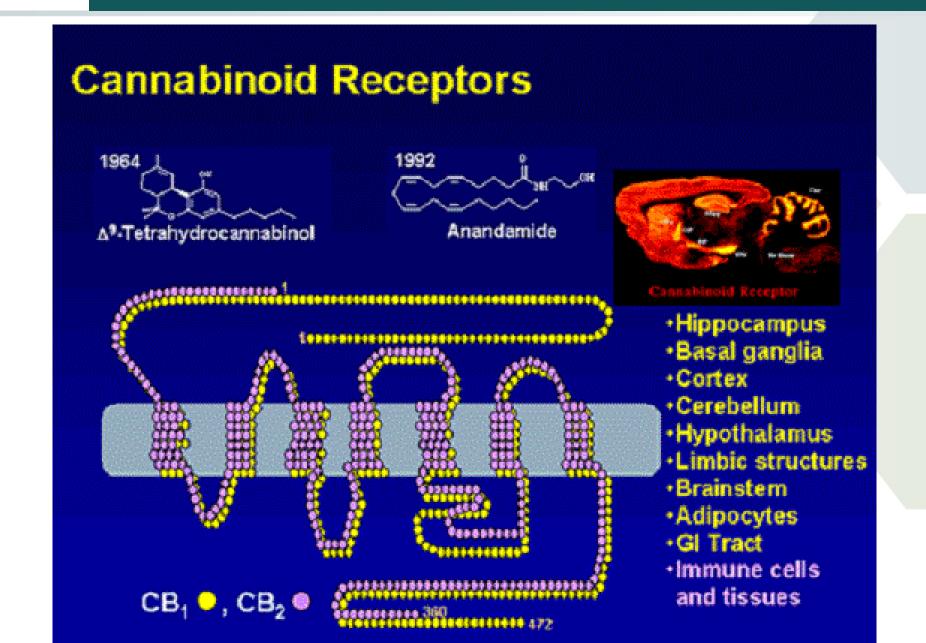


► Cocktail 1

- Probiotics prior to Rifamixin treatment (continue rifamixin through treatment and afterwards)
- ► Rifamixin (dose to be determined)
- ► L-Ornithine L-Aspertate (LOLA) 2-3 tsp daily
- ► Glycerol phenobutyrate (Ravicti) (4.5 11.2 ml/m2/day PO, .06ml/g of dietary protein/day. divided into 3 dose. max 17.5 ml/day. Start at 4.5ml/m2day.)
- ▶ Ubiquinol (CoQ10) 300mg daily
- ► Acetyl-l-carnithine 500mg daily
- ▶ Adequate and balanced nutrition to prevent catabolic state.









Anandamide is the endogonous ligand of the cannabinoid system and intimately involved in cell signaling associated homeostasis. Elevated levels of anandamide are believed to have potential therapeutic value for the treatment of eating and anxiety disorders as well as management of neuropathic pain. Ananamide is also involved in prostaglandin biosynthesis which is involved in inflamation mechanisms.

Propose upstream and downstream "druggable" targets that woud be useful in treating: a) neuropathic pain, b) Crohn's disease (Inflamatory bowel disease). Breifly explain your target(s) selection.

