

Welcome!



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Applied Functional Medicine™

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THE SCHOOL OF
Applied Functional Medicine™

Applying Functional Medicine to Maximize Your Clinical Impact: The Science and The Art That Many Practitioners Miss Through the Lens of IBS

Meet Jack and Joanne

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“I have to say I continue to marvel at how effective this whole realm of functional medicine is proving to be.

This late in my career I never expected to learn so much about the actual causes of disease. Great stuff.”



“Yes I am feeling so much better. I am so happy my joints stopped hurting. I am thankful. Now I know foods that my body does not want so I can help myself.”



Today's Menu

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- ❖ The Future of Functional Medicine?
- ❖ IBS is a Symptom
- ❖ A Perspective Shift on Gut Priorities
- ❖ Chains of Interconnectedness: Causality in IBS
- ❖ Crap Food, Stress, and Toxins: Powerful, Often-Neglected Fundamentals
- ❖ Common Challenges in Resolving Gut Dysfunction



The Power (and Future) of Functional Medicine

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“Functional Medicine is a Science-based, personalized healthcare approach that assesses and treats underlying causes of illness through individually-tailored therapies.”

- Dr. Mark Hyman

- ❖ Demand has never been higher (from practitioners and patients alike) for **health care that aims to resolve disease by addressing its root causes in a unique individual.**
- ❖ Too many passionate, seasoned **practitioners are Not having the Clinical Impact they crave** or, as a result, the Fulfillment they originally sought in their profession.
- ❖ Effective functional medicine requires **deep learning and savvy clinical application.**
 - Rich understanding of the science vs. cursory knowledge.
 - Rigorous science is key. But it's not enough. Patient **Education, Inspiration, Empowerment, and Community are essential** components of effective health care.
 - Resilient practitioner capability requires **nuanced practical application** vs. standard protocols.
 - Extensive real-life, **complex case practice** is key for creating confidence to support diverse cases.
 - Health foundations must be prioritized. **Facilitating sustainable lifestyle change** is a must.
- ❖ **Balancing Art and Science** in applied Functional Medicine maximizes clinical outcomes!

All Things are Interconnected, Uniquely!

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Oxygen Intake and Spiritual Mindset

Stress and Stress Management

Toxins and Detoxification Ability

Sensitivities and Allergies and Immune Health

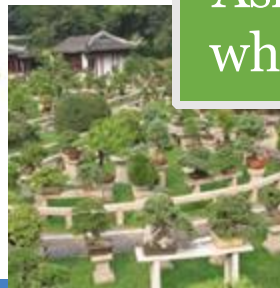
Energy Generation and Circulation

Nourishment and Absorption Ability

Genetic Predispositions and Infections

Expectation, Association, History, Belief

Ask what kind of *Person* has this dis-ease vs.
what kind of *Dis-ease* does this person have?



IBS: a Symptom, not a Disease Dynamic

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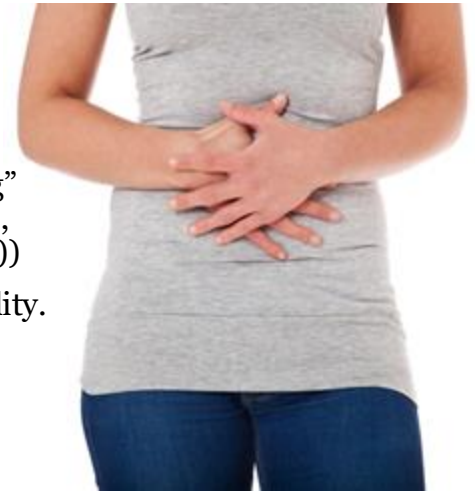
❖ Irritable Bowel Syndrome

❖ Characterized typically by a **variety of symptoms:**

- Irregular bowel movements e.g. Constipation, Diarrhea, or Alternating between the two
- Cramping pain/discomfort
- Abdominal bloating/distention, flatulence
- Higher incidence of perceived food intolerance
- Fatigue

❖ May ultimately be **caused by one or more functional imbalances** such as...

- **Maldigestion** (e.g. **poor eating hygiene**, insufficient HCl, pancreatic insufficiency, poor brush border enzyme function (e.g. NSAIDs, histamine overload), poor gallbladder emptying, thick bile, poor hepatic-biliary flow, poor vagal tone or ileocecal valve tone, post-covid tissue damage from high ACE2 receptor density)
- Digestive intolerance (e.g. lactose intolerance)
- **Food sensitivities** or allergies
- **Dysmotility** (e.g. **stress**, poor neuromuscular function impairing MMC, sedentary, **insufficient magnesium**, hypo/hyper thyroid, poor peristalsis, prior “food poisoning” pathogen exposure, **serotonin imbalances** (SSRI, gas byproducts from overgrowths), sympathetic nervous system dominance (again, stress!), medications (e.g. narcotics))
- Anatomical blockages (e.g. adhesion, surgery, injury) may significantly impair motility.
- **Microbial dysbiosis** (e.g. pathogens (like food poisoning), SIBO/IMO/SIFO, perhaps with immunosuppression (e.g. stress, medication, high viral challenge)). Between 4% and 78% of patients with IBS and 1% and 40% of controls have SIBO.
- Estrogen dominance (nearby prostaglandins promote cramps/dysmotility)



IBS Relief Considerations

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- ❖ **Spasms** (magnesium glycinate (~300mg, 1-2x/day), evening primrose oil (reduces prostaglandins, e.g. from PMS), carminative herbs such as peppermint or fennel oils (as directed, 2-4x/day but **not if there is acid reflux, try bitter herbs instead**))
- ❖ **Constipation** (magnesium citrate (as above, at night), stimulating herbs temporarily if needed, especially during antimicrobials e.g. senna, Dr. Schulze Formula #1, perhaps **5-HTP** (50-100mg per dose and ensure use of B-complex or use a formula with P5P form of B6 e.g. Pure Encapsulations' "MotilPro"), bitter herbs, *Bifidobacteria*, and especially for suspected IMO dysbiosis, consider Atrantil).
- ❖ **Diarrhea** (activated charcoal, **Bentonite clay***, *L. plantarum*, *L. rhamnosus*, *S. Boulardii*, optimize zinc status, trial of dairy food elimination, check/change magnesium formulation (oxide? citrate?), add soluble fiber to diet low'n'slow to tolerance e.g. chia seeds, apple sauce, banana).
- ❖ **Bloating** (carminative herbs, low residue diet, **digestive enzymes**, activated charcoal (away from meals), **movement**, practicing "food combining").
- ❖ **B12 deficiency** (common in SIBO as microbes disconnect B12 and intrinsic factor, hydroxocobalamin, stomach acid support)
 - **Mucosal damage may impair absorption of other nutrients as well**, especially minerals and fats and fat-soluble vitamins. Wise labwork e.g. RBC Zinc, RBC magnesium, Vitamin A, Vitamin D.
- ❖ **Stress reduction** (e.g. right type/amount exercise, acupuncture**, meditation, **gratitude journaling**, healing visualization). Restorative sleep to boost immunity and normalize cortisol.
- ❖ Remember the gut/brain axis; 80-90% of vagus nerve transmission goes From the gut and To the brain. **Mood disorders** affect more than half of IBS patients. ***
Education may provide your patients relief and inspiration to prioritize greater self-care.



* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5632318/>, ** <https://www.sciencedirect.com/science/article/pii/S0025619620301518>

*** Microbiome status can significantly affect mood and cognitive function! <https://www.nature.com/articles/mp201650.pdf>

A Perspective Shift on Gut Priorities?

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What FM Today Gets Right

- ❖ Eat real food.
- ❖ Don't eat chemicals.
- ❖ Digestion is not a given.
- ❖ Arrest overgrowths (e.g. SIBO).
- ❖ Leaky gut is real (but not universal).
- ❖ NSAIDs erode mucosa.
- ❖ Optimize bowel movements.
- ❖ The gut is Immune Central.

Where we Need to Focus More!

- ❖ **Mouth** (e.g. microbes, mercury (Hg), root canals, secretory IgA)
- ❖ **Eating Hygiene**, especially Chewing
- ❖ **Motility** (e.g. microbial regulation, GB motility, Migrating Motor Complex (MMC), peristalsis, stress, gastric emptying effect on Insulin regulation)
- ❖ **pH** (e.g. HCl, bicarbonate, bile, yes! But also Enzyme activation, acid-producing microbes)
- ❖ **Barrier Integrity** (e.g. LPS, IL-6, COVID, histamine, sIgA, alcohol, SCFAs, BBB impact, H₂S)
- ❖ **Epithelial Function** (e.g. brush border enzymes, metformin, MALT, detoxification)
- ❖ **Microbial Diversity** (e.g. maximize it, avoid antimicrobials where possible, seeing opportunistic commensal species overgrowth as a “wake up call”, avoid a “kill everything questionable” approach)
- ❖ **Parasympathetic activation** (e.g. vagal function/tone, breathing, immune brake, sleep)
- ❖ **Immunoregulatory balance** (e.g. gut-microbe-brain axis, NF-kB, chronic stress, COVID, O₃s glucocorticoid resistance, hypoadrenal states)

Missteps and Opportunities in Gut Dysfunction

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Another day, another dysbiosis.
New stool test, new culprit,
new treatment.

But to logically expect
sustainable gut health,
practitioners must
address the terrain that
enables dysbiosis.

The underlying, essential
gut imbalances!

-Tracy Harrison



www.SchoolAFM.com
The School of Applied Functional Medicine

Recurrence is common!

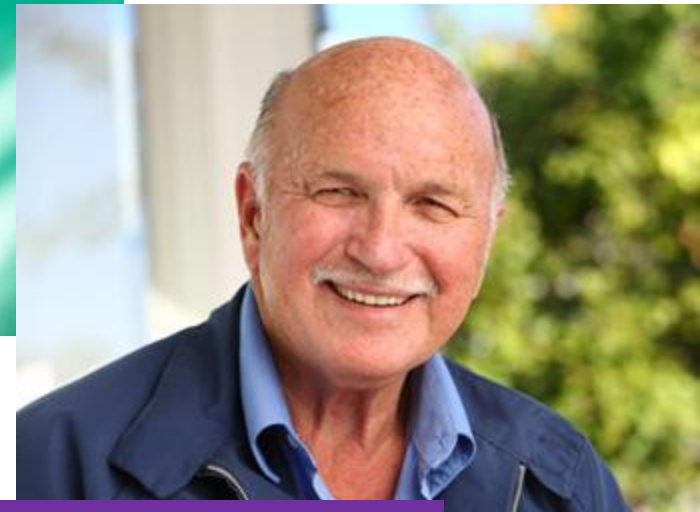
We need a broader focus on creating
an environment (terrain) that enables
the gut to thrive sustainably.

Addressing the underlying functional
imbalances that promote disease.

In the gut, in the systemic body,
in the overall life system.

IBS: Who is this Person?

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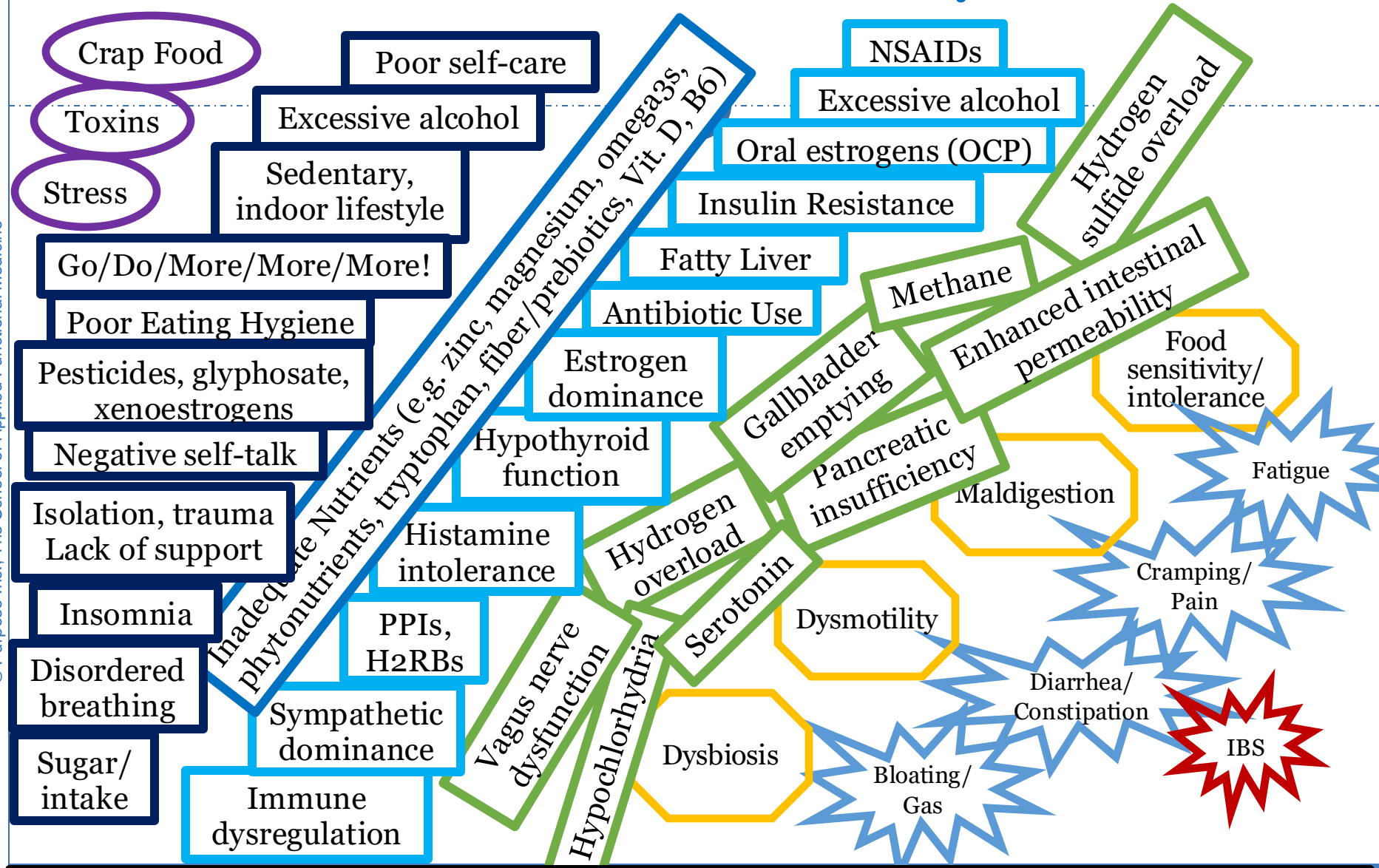


“Even if one has an accurate Diagnosis, the pathway for resolution is still about **identifying and resolving the Dynamics that are actually present** in each unique individual.”

- Dr. David Perlmutter

IBS Chains of Interconnected Causality

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Upstream



Downstream

Multifactorial Pancreatic Insufficiency

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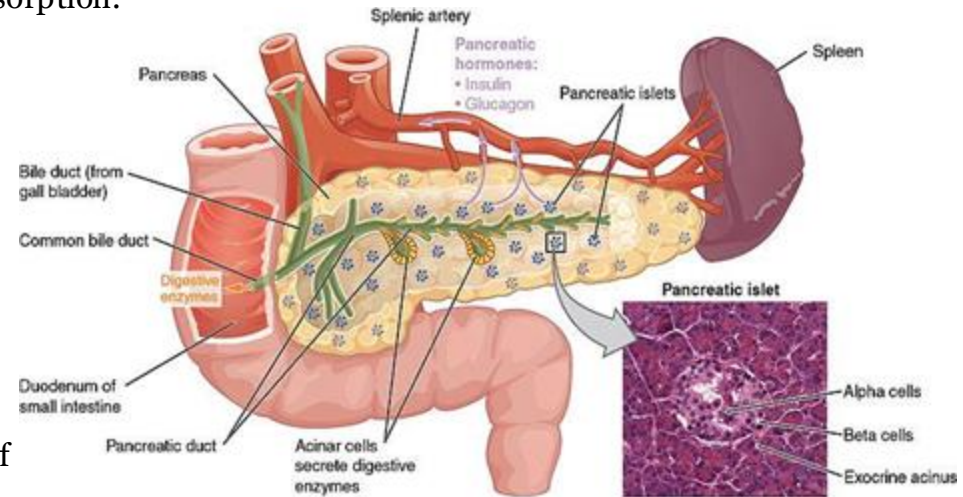
❖ Exocrine and endocrine roles.

Connected to GI tract (via the duodenum) and systemic body (via blood vessels).

- **Digestive:** producing digestive enzymes and bicarbonate which help to break down foods in the intestines. 99% of pancreatic cells do this. Digestive enzymes are also secreted into the blood to help with housekeeping throughout the body (e.g. lipases assist in minimizing fatty deposits in the liver and elsewhere).
 - **Exocrine pancreatic insufficiency common in both insulin and non-insulin dependent diabetes** (25-50% T2D patients, even higher in T1D). Disease duration and severity are risk factors. May promote downstream gut dysbiosis and/or nutrient malabsorption. *
- **Endocrine:** producing **insulin, glucagon,** & other key hormones. ~1% pancreatic cells do this.
 - Insulin ** works with glucagon to manage blood sugar across the spectrum of being fed to fasting.

❖ Like any other organ/gland, the **pancreas can become impaired by systemic effects*****

- Damaged from autoimmune action, high free fatty acids, or oxidative stress (hyperglycemia).
- Becomes **“fatty”** with increased fat deposition (e.g. when the liver is also fatty) and **beta islet cell dysfunction often begins**, moving the progress of Metabolic Dysfunction **into Type 2 diabetes.** **Alpha cell dysfunction** might also cause abnormal glucagon secretion, promoting metabolic dysfunction and exacerbating hyperglycemia or hypoglycemia. #
- **Beta islet cell regeneration is possible.** Alpha cell differentiation has also been demonstrated.



* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4393909/> , https://care.diabetesjournals.org/content/31/Supplement_2/S165

** http://www.vivo.colostate.edu/hbooks/pathophys/endocrine/pancreas/insulin_phys.html

*** <https://diabetes.diabetesjournals.org/content/51/1/7.long> , <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3934755/> ,

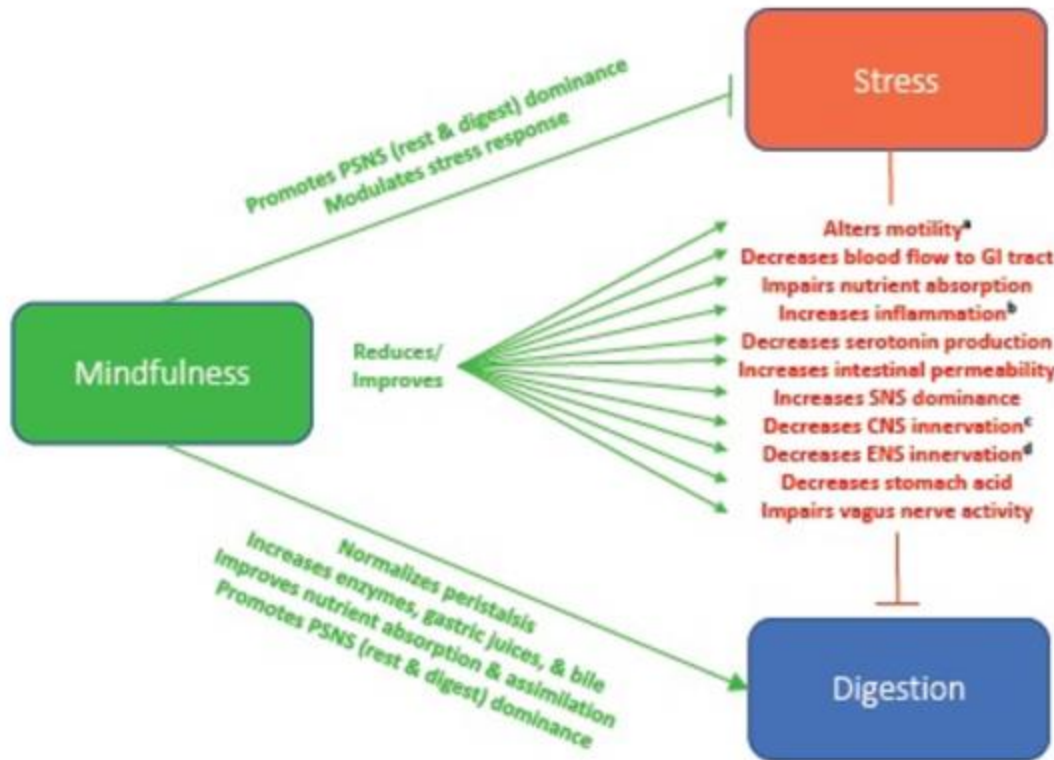
<https://diabetes.diabetesjournals.org/content/64/6/1886> , <https://www.hindawi.com/journals/crie/2018/6147349/> , <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3168743/>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2877635/> , <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6606577/>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4342530/> , [https://www.mayoclinicproceedings.org/article/S0025-6196\(17\)30874-1/fulltext](https://www.mayoclinicproceedings.org/article/S0025-6196(17)30874-1/fulltext)

Stress, Digestion, and Mindfulness

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Negative Effects of Stress

- Motility:** decreased motility increases risk of dysbiosis; increased motility impairs nutrient absorption
- Inflammation:** increases pro-inflammatory cytokines, resistance to cortisol's initial anti-inflammatory effect
- CNS innervation:** dysregulated motility, stomach pain, nausea, vomiting, diarrhea
- ENS innervation:** disrupted small segmentation contractions, peristalsis, and Migrating Motor Complex (MMC)

Eating Hygiene: Not so Sexy but Essential

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- ❖ **Chewing and Swallowing:** the only part of our entire digestive process that is voluntary!
- ❖ Many people rush to eat and gulp our food quickly in larger chunks and wash it down with large volumes of liquid.
- ❖ Ideally, we **chew food until it's quite liquidy** and *primarily hydrate steadily in between meals* (vs. during).
- ❖ Drinking a *large* volume of water or other neutral/alkaline liquid during meals can **dilute stomach acid notably** which may:
 - Create discomfort, bloating, belching, early satiety.
 - Impair protein digestion (via reduced pepsin effect).
 - Impair mineral absorption.
 - **Promote acid reflux.***
- ❖ IBS-like symptoms are a **logical outcome** of chronically poor eating hygiene!



** Low stomach acidity slows gastric emptying which can promote GERD e.g. <https://www.ncbi.nlm.nih.gov/pubmed/20012198> , <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8158412/>

Disease Begins with Maldigestion/Malabsorption

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- ❖ In the **Brain**: Stress, anxiety, ruminating, depression. *All these suppress parasympathetic response and downstream vagal stimulation of All digestive functions!*
- ❖ In the **Mouth**: Impaired by **poor chewing** (especially due to rushed, distracted eating), low saliva production (e.g. dehydration, some drugs (antihistamines, beta blockers, anticholinergics), very low estrogen, Sjogren's).
- ❖ In the **Stomach**: Impaired by what does (or doesn't) happen upstream in the mouth *and also impaired by eating in a stressed or rushed state**, drinking copious liquid during meals, bariatric surgery, **hypochlorhydria** e.g. medications (e.g. proton pump inhibitors, H2 receptor blockers, NSAIDs), *Helicobacter pylori* overgrowth, age, allergy/asthma, **hypothyroid function**, hypoadrenal function.
- ❖ In the **Small Intestines**: Impaired by what does (or doesn't) happen upstream *and also impaired by* stress or lack of sleep, **low digestive enzyme secretion** (e.g. **insulin resistance**, **hypochlorhydria**), microbial imbalance or overgrowth, **poor bile consistency or flow** (e.g. NAFLD, taurine, B6, missing GB, high estrogen states), microbial imbalance (e.g. SIBO, pathogens), food allergy or sensitivity, medications (e.g. birth control pills, corticosteroids, NSAIDs, statins?**), thinning of or damage to mucosal lining /villi (e.g. celiac, dysbiosis), hypothyroid / hypoadrenal.
- ❖ In the **Large Intestines** (Colon): Impaired by what does (or doesn't) happen upstream *and also impaired by* food grazing (in sensitive folks), low-fiber diets, high dietary sugar or chemicals, toxin transport, neuropathy, **diarrhea**, antibiotic use (bacteria make enzymes too!), diverticulosis, constipation.

* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC26223/>

** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5550934/>

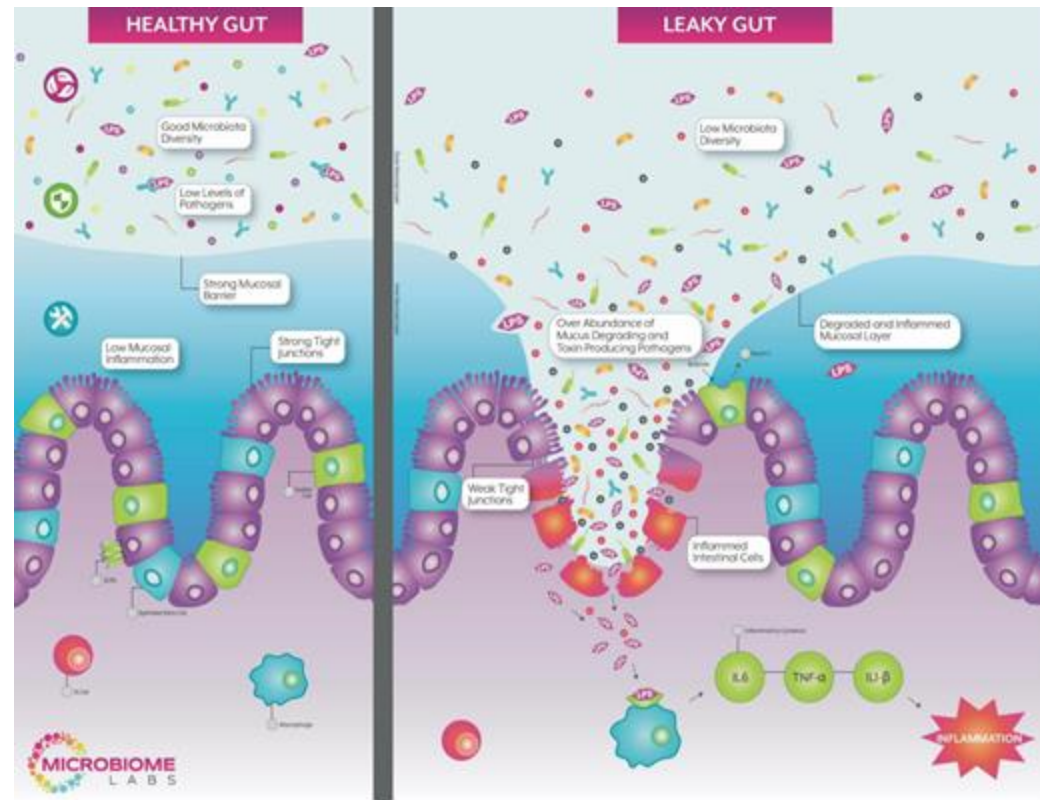
Enhanced Intestinal Permeability

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❖ **Optimal intestinal barrier** function allows the passage/absorption of nutrients, but at the same time, it must regulate the contact between luminal antigens and the immune system, confining undesirable products to the lumen. It's a delicate balance!

❖ **Common Contributors to excessive permeability**

- NSAID drugs###
- Other drugs (e.g. hormones, birth control pills, chemotherapy)
- Microbial endotoxins (e.g. LPS)
- **Microbial overgrowths** (e.g. SIBO)***
- **Hydrogen sulfide** or d-lactate overload
- Histamine overload
- Pathogenic microbes
- **High blood sugar**##
- Antibiotics
- Insufficient Vitamins D and A, **zinc**#
- Isolation from "old friends"***
- Chemicals, pesticides, food additives, **glyphosate****
- Gluten, zonulin
- **Stress**
- **Smoking**
- **Highly processed foods**



Overall overview: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5988153/>

Image Credit: Microbiome Labs

* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8007786/>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8290187/>

https://www.researchgate.net/publication/328743068_Hyperglycemia_drives_intestinal_barrier_dysfunction_and_risk_for_enteric_infection

** Good overview for practitioner/patient and extensive reference resource: <https://chriskresser.com/the-impact-glyphosate-can-have-on-your-health/>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6431494/> *** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7925957/#bibr54-1756284821993586>

All Things are Interconnected, Uniquely!

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Oxygen Intake and Spiritual Mindset
Stress and Stress Management
Toxins and Detoxification Ability
Sensitivities and Allergies and Immune Health
Energy Generation and Circulation
Nourishment and Absorption Ability
Genetic Predispositions and Infections
Expectation, Association, History, Belief

Ask what kind of *Person* has this dis-ease vs.
what kind of *Dis-ease* does this person have?

Putting the Puzzle Pieces Together

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We are not designed to be
Stressed, Toxic, Inflamed, Infected, Malnourished, & Unrested
and yet still easily

Thrive, Grow, Reproduce, be Lean, feel Well,
Eat Anything we want, enjoy perfect BMs, and have Great Sex.

This combination would be Not Natural.



Why are we struggling?
Crap Food, Toxins, Stress

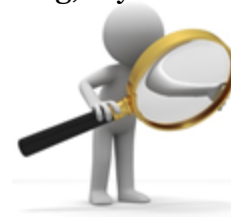
Even when aware, we lack Education, Inspiration,
Empowerment, and Community support!



Food: Teach What's In There!

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- ❖ **Categories:** vegetables, fruits, nuts, seeds, whole grain, legumes, eggs, dairy, meats, poultry, seafood, oils/fats, seaweed/algae, insects, sugar/sweeteners, spices/herbs/seasonings, ferments.
- ❖ **Core components:** carbohydrates, proteins, fats, fiber, water.
- ❖ **Nutrition:** calories, minerals, amino acids, vitamins, essential fats, phytonutrients.
- ❖ **Impact:** ATP, enzymes, hormone metabolism, tissue growth and healing, detoxification.
- ❖ **Experience:** satisfaction, deprivation, pleasure, discomfort/pain, habit, inconvenience, connection, memories and rituals, loneliness, eating quickly or slowly.
- ❖ **Broken/Refined food ingredients:** vegetable oils, stripped and bleached grain flours, high fructose corn syrup (HFCS), transfats, GMO foods, fillers (e.g. meat glue, wood pulp as “cellulose”), MSG (e.g. hydrolyzed vegetable protein), emulsifiers and thickeners (e.g. carrageenan*), flavor enhancers (e.g. glutamate), and texturizers (e.g. gelatin).
- ❖ **Artificial additives**:** sweeteners# (e.g. aspartame, sucralose), chemical flavors, preservatives (e.g. sodium benzoate, TBHQ, “pink slime” with ammonia hydroxide), colors (e.g. Blue Lake, Red #40), olestra (fake fat), leavening agents (e.g. potassium bromate***).
- ❖ **Residues:** antibiotics, advanced glycation end products (AGEs e.g. French fries, potato chips), heterocyclic amines, BPA, glyphosate, toxic elements (e.g. arsenic in rice, mercury in fatty fish), mycotoxins (e.g. cashews, peanuts, grains, coffee), fluoride (e.g. tea, wine), cookware or food storage debris (e.g. iron, aluminum, BPA, microwaved-plastic-bag, Styrofoam).
- ❖ **Unwelcome guests:** bacteria (incl. antibiotic-resistant strains), mold, parasites.
- ❖ **Potential dis-ease culprits:** histamine, salicylates, oxalates, phytate, lectins, tannins, allergen, sensitivity, intolerance, **high-fat, high-fiber, high-protein, high-carb, high-sugar, high-calorie, low-fat, low-fiber, low-protein, low-carb, low-calorie. Bio-individuality!**

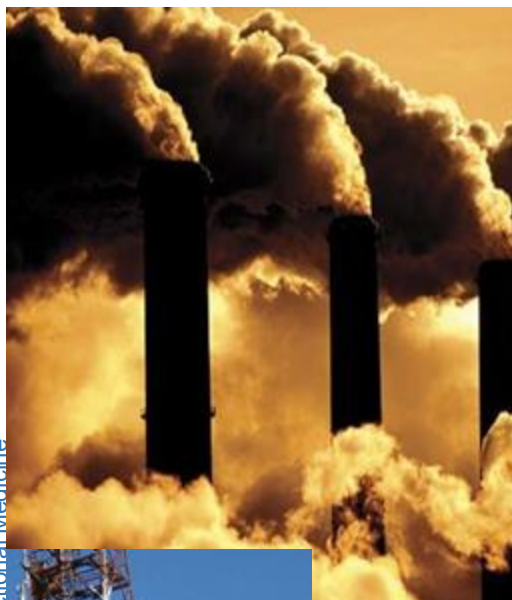


* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8539934/> # Artificial sweeteners and gut permeability? <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7353258/>

** A list of additives and their use/status re: the US FDA: <https://www.fda.gov/food/food-additives-petitions/food-additive-status-list>

*** An aggressive, carcinogenic, oxidative agent, banned in many countries, found in high residue in breads e.g. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8269585/>

This topic is explored in depth in the Nutrition/Supplementation 101 course.



Mechanisms of Dysfunction from Toxic Overload*

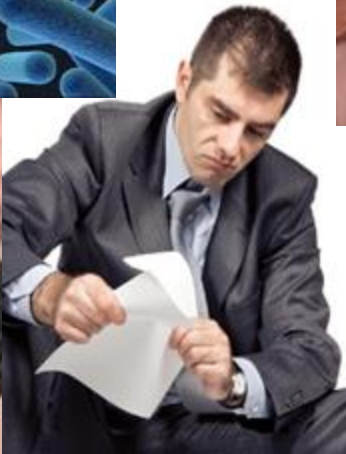
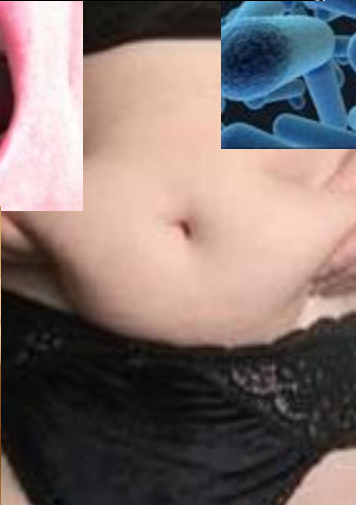
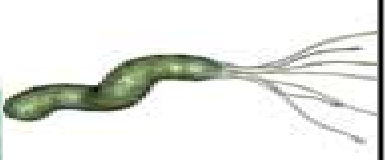
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- ❖ **Cellular damage** (e.g. DNA, cell membrane, mitochondria, endoplasmic reticulum) which can do anything from promoting carcinogenesis to dysregulating apoptosis to impairing cell signaling to reducing ATP formation. **Ultimately affecting any cell's function e.g. neurons, pancreatic b cells, enterocytes.**
- ❖ **Increased oxidative stress** (increased reactive oxygen species) which can drive cycle of inflammation and more oxidative damage over time, including plaque formation.
- ❖ **Enzyme dysfunction** (e.g. mineral substitution, protein misfolding) that can impair anything from **detoxification itself** (e.g. Phase 1 CYP450, Phase 2 NRF-2 or GPX, Phase 3 p-glycoprotein) to thyroid function.
- ❖ **Displacement** e.g. lead for calcium or BPA displacing testosterone in SHBG.
- ❖ **Immune system disruption** (e.g. NF-kB) which promotes the cycle of chronic inflammation and oxidative damage and more inflammation (e.g. common dynamic in neurotoxicity), immunosuppression or **primed hypervigilance (e.g. asthma, allergy, autoimmune disease, multiple chemical sensitivity).***
- ❖ **Microbiome imbalance** e.g. overt antimicrobial effect, future antimicrobial resistance.
- ❖ **Hormone receptor dysfunction**
- ❖ **Increased adiposity** to serve as toxin depot for protecting vital glands/organs.#
- ❖ **Epigenetics** (e.g. DNA methylation, histone behavior) which may have immediate, later-in-life, and also later succeeding generational effects.
- ❖ A rich mix of overt **damage to Cells** and downstream **damage to Function including the body's own ability to rid itself of the toxin.**

* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6858758/> , [https://www.jacionline.org/article/S0091-6749\(17\)30846-1/fulltext](https://www.jacionline.org/article/S0091-6749(17)30846-1/fulltext)

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2664469/>

An extensive set of curated references for many of these mechanisms of disease may be found in the Toxicity/Detoxification clinical course.



Dis-ease in the Nervous System?

❖ Sympathetic

- Fight-or-Flight-or-Hide
- Increased focus and alertness
- Increased metabolic activities to prepare body for emergency activity
- Designed to be short-term exceptions for survival

❖ Parasympathetic

- Rest-and-Digest-and-Heal
- Relaxed external muscles.
- Increased digestive activities to store energy for future use.
- **Immune function.**

○ Designed to be our primary state

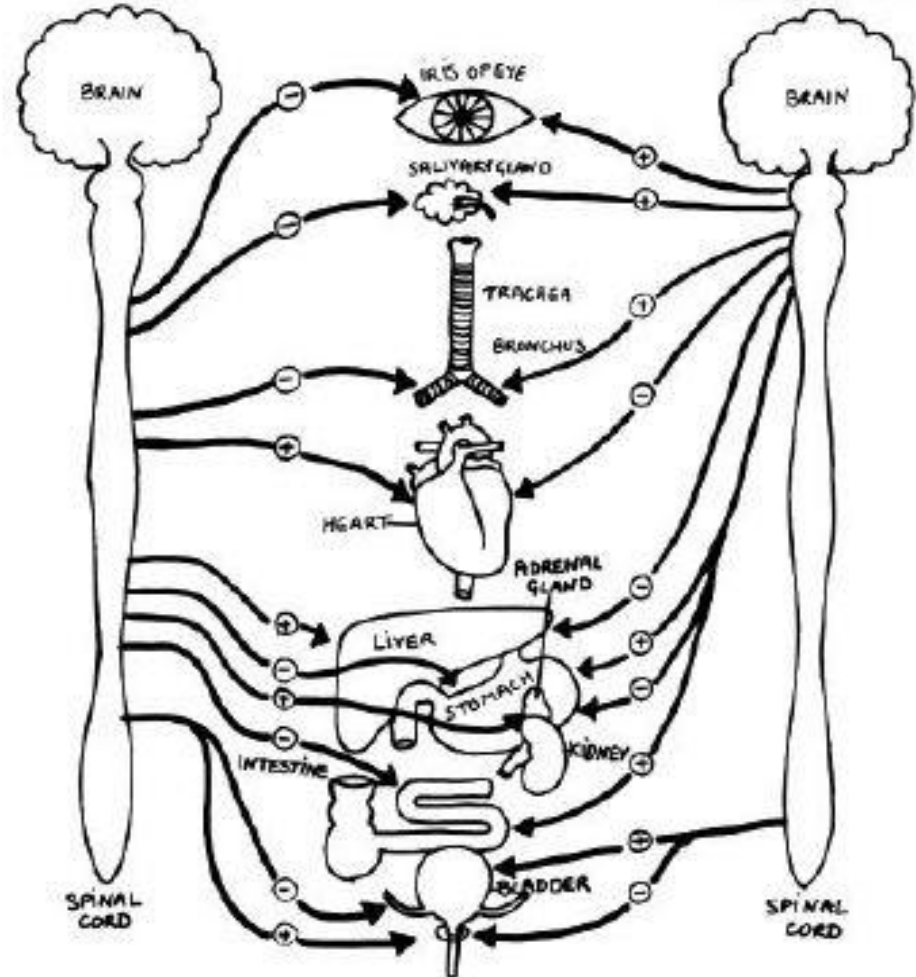
- ❖ Most organs and glands in the body have receptors to **receive impulses from both modes** (either inhibitory to “stop work” or stimulatory to “work harder”)



the sympathetic nervous system



the parasympathetic nervous system



⊕ increased muscle contraction and gland secretion

⊖ decreased muscle contraction and gland secretion

Chronic Bio-individual Stress Sources

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- ❖ **Emotional stress** (especially the combination of possible/actual harm and loss of control)
 - Work performance, family dynamics, finance issues, peer approval, etc..
 - Grudges, resentment, unalleviated anger, living in the past, unexpressed emotions...
 - Preoccupation with what is missing, never having “enough” of something/anything
 - **Loneliness**, social isolation, lack of social support**

- ❖ But also **Physical Stress** in various forms...
 - Infections (viral, bacterial, fungal, parasitic...)
 - Inflammation (e.g. arthritis), Obesity
 - Insufficient sleep, **sleep apnea**, shift work, jet lag
 - Overuse of stimulants (e.g. caffeine***, sugar, chocolate)
 - Toxins (including overuse of medications)
 - **Too much exercise** (or physical trauma)
 - Allergen exposure, **including food sensitivities**.
 - Poor detoxification (toxin tissue storage e.g. mercury, lead)
 - Insulin Resistance (and Hyperglycemia) and Hypoglycemia
 - **Teach patients that cortisol raises blood sugar, perhaps much more than their dietary carbs/sugars.**
 - Insufficient caloric intake (think of over-exercisers) or **dietary carbohydrates** (for unique person)****
 - **A low, very low, or no-carb diet must have adequate fatty acid metabolism in order to thrive, which requires B vitamins, carnitine, and healthy mitochondria. Some may thrive best with 30-40% carbohydrates vs. ~10% (e.g. winter squash, tubers, whole fruit). Paleo ≠ Low Carb. Leafy greens still needed for prebiotics!**

A vicious cycle?
A strong stress response promotes survival, but at a cost! Chronic immune suppression can create more stress triggers.

http://www.lifestylematrix.com/assets/1/7/The_Role_of_Stress_and_the_HPA_Axis_in_Chronic_Disease_Managment_Excerpts.pdf

** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2841363/> *** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2257922/>

**** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3641164/> and <https://www.ncbi.nlm.nih.gov/pubmed/20860883>

This topic is explored in depth in the HPATG Axis/Endocrine clinical course.

Optimizing Parasympathetic Response on Purpose

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- ❖ Meditation, Hypnosis
- ❖ Maintain a diverse, healthy microbiome (e.g. diet, sleep, Abx avoidance)
- ❖ Traditional and Electro-Acupuncture
- ❖ Diet: Higher fat diet, sufficient choline, polyphenol-rich
- ❖ Targeted synbiotics
- ❖ Fasting (appropriate)
- ❖ Exercise (appropriate)
- ❖ Yoga, Tai chi chuan, feeling connected in shared experience
- ❖ Mindful Breathing. Slow, less frequent and via the nose. Exhalation equal to or longer in duration than inhalation. Pauses between inhalation/exhalation. All of these not typical when you're in a sympathetic N/S mode! Address mouth breathing.
- ❖ Choices that reduce cortisol or increase oxytocin. Smiling, laughing, time with pets, hugging, snuggling, good sex, singing, falling in love, hobbies that are relaxing (vs. stressful re: achievement bias).
- ❖ Gratitude journaling (5-10 minutes)
Not just a quick “family, healthy, friends” kind of superficial reflection. Choose 3 very specific things that engage your emotions and your memory. Relive it.
- ❖ Become Mindful and Selective about habitual thought patterns.
Signal to the body feeling safe, secure, and supported.
- ❖ Meet the required, daily minimal intake of the “other vitamins” (J=joy, P=play, N=nature)

[Ann N.Y. Acad. Sci.](#), Author manuscript; available in PMC 2015 Aug 12.

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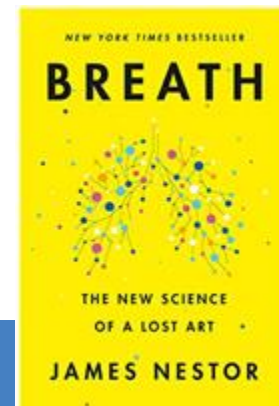
[Ann N.Y. Acad. Sci.](#) 2009 Aug; 1172: 172–180.

PMID: [19743552](#)

doi: [10.1196/annals.1393.013](#)

The Inflammatory Reflex and the Role of Complementary and Alternative Medical Therapies

Stacey L. Oke and Kevin J. Tracey



Interconnectedness can be a Vicious Cycle

28

❖ **Crap Food**

- Doesn't give Nutrients, May contain Toxins, Increases stress.
e.g. loaded with refined carbohydrates, fructose, chemicals, pro-inflammatory fats.

❖ **Toxins**

- Deplete nutrients, Increase stress, Impair metabolism/detoxification.
e.g. promotes oxidative damage to cell membranes, interferes with enzymes that drive cellular respiration, enable detoxification, and hormone metabolism.

❖ **Stress**

- Depletes nutrients, Impairs digestion, Impairs detoxification.
e.g. increases oxidative damage and blood sugar separate from food.

Given our **Choices**, is it really
a wonder we struggle with so
much chronic dis-ease?

Choices

Choices

WELL-NESS

ENVIRONMENT

GENES

BIOCHEMISTRY

?

ILL-NESS

Opportunities in Optimizing Gut Dysfunction

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Another day, another dysbiosis.
New stool test, new culprit,
new treatment.

But to logically expect
sustainable gut health,
practitioners must
address the terrain that
enables dysbiosis.

The underlying, essential
gut imbalances!

-Tracy Harrison



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Recurrence is common!

We need a broader focus on creating
an environment (terrain) that enables
the gut to thrive sustainably.

Addressing the underlying functional
imbalances that promote disease.

In the gut, in the systemic body,
in the overall life system.

Thank You for Joining Us



- ❖ **We appreciate you being here!**
- ❖ We invite you to learn more about our **transformative training program in applied functional medicine for practitioners**: <https://schoolafm.com/our-program/>.
- ❖ Be sure to check out **additional, exciting SAFM events and content**

