

# Welcome!



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# **Conquering Constipation: From Rapid Relief to Root Cause Resolution**

## **An SAFM mini Clinical Course for Practitioners**

# Today's Agenda

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- ❖ Complex Cases: The Humanity of Constipation
- ❖ Gut and Constipation Fundamentals
- ❖ Conventional Constipation Triage Remedies and Alternatives
- ❖ Root Causes of Constipation
- ❖ Resolving Constipation
- ❖ Final Practical Considerations for Practitioners  
(and a special opportunity!)



# 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 *Disease* does this person have?

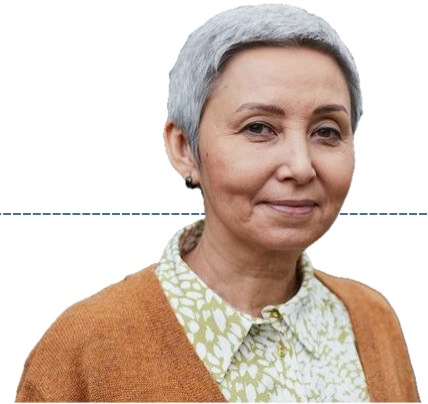


# Complex Cases: The Humanity of Constipation



# Meet Deena

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- ❖ 62 year old female whose husband just had a stroke and mother has dementia, so is concerned for her own health
- ❖ **Current complaints:** morbid obesity, prediabetic, hypertension, hypercholesterolemia, aching knees and back, tight muscles, headaches, restless legs, GERD, constipation, poor sleep onset and wakes to urinate around 2 am
  - “I’ve been constipated for as long as I can remember, my momma even used to tell me that when I was a baby, I could go for a couple weeks without pooping.”
- ❖ **Diet:** Consumes mostly meat and potatoes, occasionally some salads or frozen veggies. Loves to bake – often daily – to relieve stress. Insufficient water intake.
- ❖ **Rx meds:** Omeprazole 40 mg, Zofran 8 mg, Flexeril 10 mg, Tramadol 50 mg
- ❖ **OTC meds:** Docusate sodium stool softener 100 mg, antacid tablets (calcium), Aspirin 325 mg
- ❖ **Supplements:** Melatonin 1 mg, 5HTP 50 mg, vitamin D3 10,000 IU daily

# Meet Natasha

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- ❖ 43 year old female
- ❖ **Current complaints:** Constipation 10+ years (BM every 3-4 days, Bristol 2-3) with very occasional diarrhea, malodorous embarrassing gas, bloating and abdominal distension within 90 minutes of eating, heaviness/food sitting in stomach, nausea, occasional reflux, iron-deficient anemia, Hashimoto's thyroiditis, migraines, depression, anxiety
- ❖ High stress: 5 school-aged children, runs a small business, volunteers
- ❖ Sleeps 5-6 hours per night ("Ha, I don't have time to sleep!")
- ❖ **Key History:** Recurrent childhood strep throat, multiple ear infections treated with antibiotics, Group B Strep+ x3 births with IV antibiotics, history of yeast infections and thrush, Lactulose SIBO breath test 3 years ago was positive and treated with 14 weeks of rifaximin
- ❖ **Diet:** Low FODMAP diet for the last 5 years out of habit (overall diet mostly chicken, beef, eggs, broccoli, cauliflower, greens salad, bread, yogurt), is afraid to reintroduce various FODMAP foods. Eats breakfast and lunch while driving or in-between appointments
- ❖ **Rx meds:** Synthroid 75 mcg, Zoloft 200 mg, Eletriptan PRN, recently finished 2 months Prevacid
- ❖ **OTC meds:** MiraLAX
- ❖ **Supplements:** Betaine HCl with Pepsin, Slow Fe 45 mg, vitamin D3 5,000 IU, grapefruit seed extract 125 mg, probiotics, FODZyme, MV

# Meet Jay

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- ❖ 33 year old male
- ❖ **Current complaints:** trouble falling and staying asleep (wakes midnight and 3 am), fatigue (6/10), low testosterone, hypertension and occasionally rapid heartbeat, “beer belly”, poor appetite, occasional vomiting when very stressed, GERD, gas and bloating most days, has bowel movements 1-4x/week with incomplete evacuation
- ❖ Works as a lawyer for a big firm, wife recently filed for divorce and is fighting for full custody of 3 year old child
- ❖ Starts day with coffee while commuting; snacks at his desk on donuts and chips found around the office washed down with 1-2 energy drinks until a late lunch at 3 pm; returns home around 7:30 pm
- ❖ **OTC medications:** Tums, Prevacid as needed

# The Power of Rapid Relief

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## ❖ **The clock starts immediately.**

Give them at least one productive focus area coming right out of your initial intake session (2 or 3 if they seem inspired, driven, and ready - but not so many as to become overwhelming). Ask them what kind of pace they are seeking?  
Be sensitive to what's going on in their immediate environment.

## ❖ Help them to take near-term action to receive some **significant relief in an area of major frustration to them**. Set reasonable expectations about how long that relief might take! Practice right away approaching the work as an exploration – with many tools/options.

- Galvanize their faith in you as a practitioner.
- Increase their commitment to their journey with you.
- And most importantly, validate their hopes that they can indeed feel better – finally!

## ❖ Common, potent areas for Rapid Relief:

- Headache
- Poor Sleep
- Constipation

## ❖ Use a detailed symptom checklist in your Initial Intake forms for specific root-cause ideas for each unique patient.



# Constipation is ~~Not Fun~~ Dangerous!

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- ❖ One of the top patient/client complaints.
- ❖ Often chronic, including since childhood or infancy.
- ❖ Can create or contribute to Many disease dynamics!

## From annoying...

- Decreased quality of life
- Hemorrhoids
- Bowel Incontinence
- Microbial Dysbiosis
- Bloating, Distention, Flatulence
- Cramping, Pain
- Fatigue, Malaise
- Headache\*

## ...to debilitating...

- Food allergies\*\*
- Asthma\*\*\*
- Hormonal Imbalance
- Diverticulosis, Diverticulitis
- Toxin Reabsorption (contributing to almost any chronic inflammatory disease)
- Autoimmune disease
- Cognitive Decline\*\*\*\*
- Anxiety, Depression#
- Inflammatory bowel disease

## ...to life-threatening!

- Coronary Heart Disease##
- Colon and Breast Cancers##
- Ischemic Stroke##
- Increased risk of All-Cause Mortality##



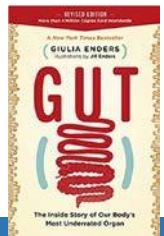
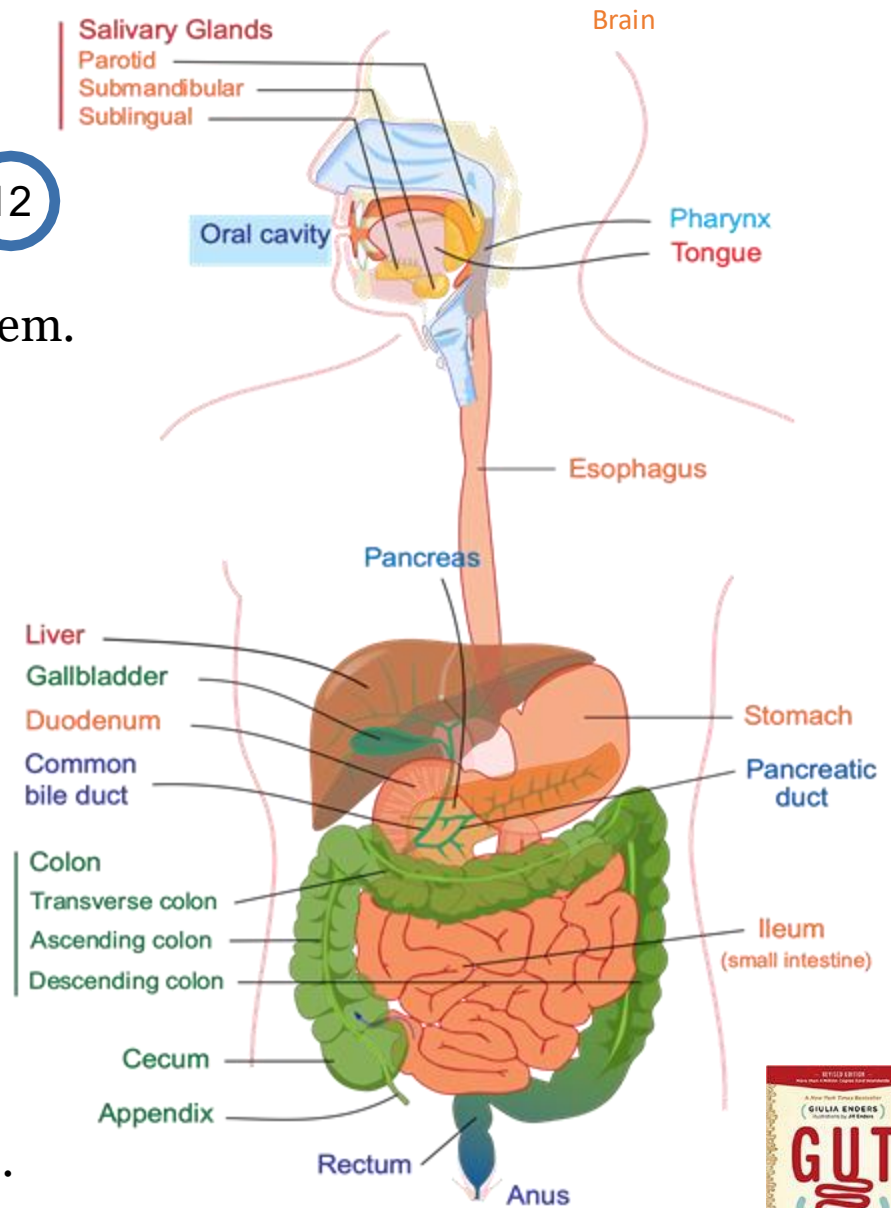
# Gut and Constipation Fundamentals



# An Introduction to Gut Anatomy & Physiology

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- ❖ “Gastrointestinal Tract or Digestive System.
- ❖ ~25-30 ft in length in adults.
- ❖ Many cavities (barriers!), glands, and hormones, working together in orchestrated activity.
- ❖ Site of digestion and absorption of macro- and micro-nutrition from food, as well as water.
- ❖ Peristalsis (wavelike smooth muscle action) keeps food, bacteria, and toxic debris moving towards the exit.
- ❖ Primary waste disposal route.
- ❖ Houses largest microbiome, which dramatically regulates immune function.



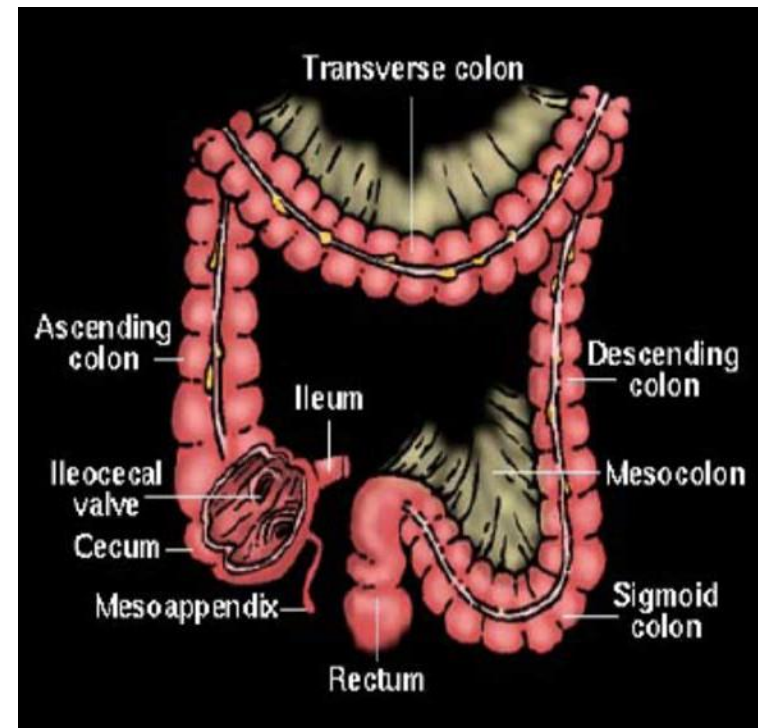
The book *Gut* by Giulia Enders provides helpful and fun/accessible education on the fundamental functions of the gut.

Image: This work has been released into worldwide public domain by its author, LadyofHats [https://en.wikipedia.org/wiki/File:Digestive\\_system\\_diagram\\_edit.svg](https://en.wikipedia.org/wiki/File:Digestive_system_diagram_edit.svg)

# Colonic Fundamentals

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- ❖ Large intestines, Bowel, or Large Bowel (or more affectionately known as “the poop percolator” by a savvy 12 year old IBS client).
- ❖ Location of final water absorption, waste deposit, and *minor* nutrient production and absorption (mostly electrolytes, Vitamin K, B vitamins and biotin).
- ❖ 3’-5’ in length.
- ❖ Home to trillions of microbes (typically, several hundred different species).
- ❖ Peristalsis moves gut contents through the GI tract, and the colon compacts this fecal material in the rectum in preparation for stool expulsion as a “bowel movement” through the anus.
- ❖ Stool contains water, fiber, mucus, sloughed cells from the intestinal lining, microbes (dead and alive), bile acids, and trace amounts of many wastes (e.g. bilirubin, estrogens, cholesterol, BPA metabolites, mercury, pharmaceutical binders/fillers, etc.).
- ❖ **Optimal transit time in the GI tract balances maximizing water and nutrient absorption with minimizing toxic exposure to colonic tissue.**



# The Systemic, Functional Impact of the Gut is Huge!

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- ❖ A weird, weird world.
- ❖ Essentially a 25-30 ft. tunnel that is a well-guarded and regulated exchange corridor which is ultimately, in a way, *outside of the systemic body*.
- ❖ The entryway for essential nutrition to fuel every cell in the body.
- ❖ The exit path for most toxins and waste – of exogenous *and* endogenous origin.
- ❖ Guarded by a planetary level population and diversity of microbes. Our biochemistry is regulated by their behavior and DNA (which transfers genes across species and to humans).\*
- ❖ Home to 2/3+ of the immune system, surveilling our intake, outflow, and microbial balance.
- ❖ Exchange controlled by a very complex, one-cell thick semi-permeable interface.
- ❖ Housing its own nervous system which generates neurotransmitters/neuropeptides used for communication throughout the body.\*\*
- ❖ The gut and brain work as an integrated axis, via the vagus and other extrinsic nerves.\*\*\*
- ❖ **All gut components ultimately affect motility and transit time! And vice versa.**



\* <https://bmcbgenomics.biomedcentral.com/articles/10.1186/s12864-017-3649-y>

<https://www.the-scientist.com/?articles.view/articleNo/47125/title/Bacteria-and-Humans-Have-Been-Swapping-DNA-for-Millennia/>

\*\* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5772764/> , <https://link.springer.com/article/10.1007%2Fs11481-019-09851-4>

\*\*\* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5808284/> , <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5859128/>

# The Enteric Nervous System

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- ❖ Motility and secretions within the GI tract from esophagus to anus are **regulated by the Enteric Nervous System (ENS), our older, “first” brain.**
  - Part of the autonomic nervous system and composed of >100 million neurons (more than are in the spinal cord).
  - **The ENS is connected to the CNS of the brain via extrinsic fibers including the vagus nerve (parasympathetic nervous system),** splanchnic nerves (viscera/organ enervation and pain perception), and pelvic nerves (sensing distension).
  - **~90% of the nerve fibers are afferent (from the gut to the brain)** via the vagus nerve (gut → CNS). Part of why we experience stress or fear or excitement in the gut (e.g. “butterflies in the stomach” or diarrhea), as well as in the rest of the body.
- ❖ **Vagal pathways impact motility by signaling peristalsis** (smooth muscle contractions), various related secretions, and reflexes through cholinergic pathways.\*
- ❖ Motility (peristalsis and migrating motor complexes (MMC)) is ultimately further influenced by the coordinated signaling and release of a variety of **neurotransmitters, gasotransmitters, hormones, and neuropeptides** (e.g. serotonin, acetylcholine, nitric oxide, methane) from compartment to compartment within the GI tract.\*\*



The first sections of <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7880310/> provide a comprehensive overview of the ENS.

\* <https://www.intechopen.com/online-first/87806> ; for a deep dive on the cholinergic pathway see <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4027320>

\*\* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7880310/>

# ENS Motility: An Orchestra of Chemical Signaling

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Motility and secretions in the GI tract are impacted by the compartmentally coordinated release and interplay of neurotransmitters, gasotransmitters, hormones, and neuropeptides.\* For example:

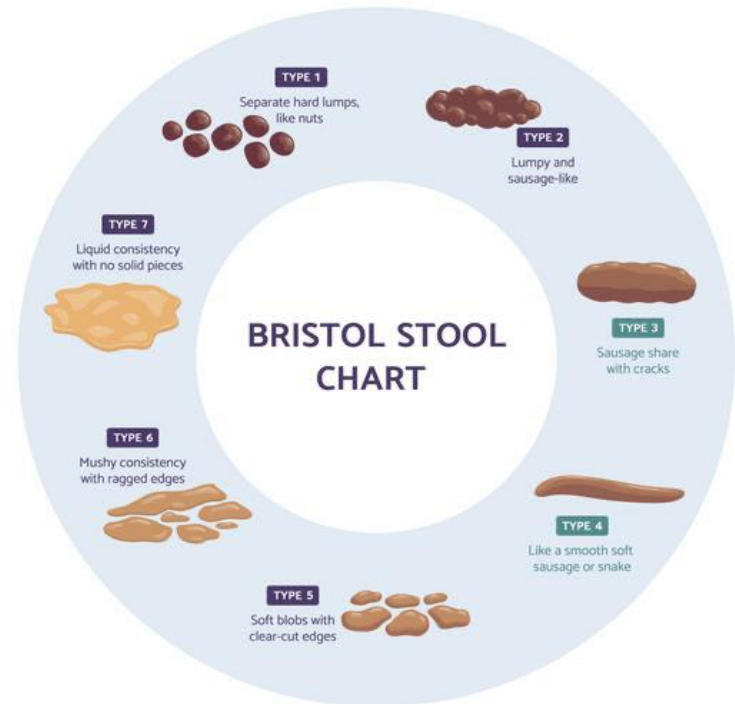
- ❖ **Serotonin has an important role in GI motility, including peristalsis.** ~95% of the body's serotonin is produced in the intestinal mucosa by enterochromaffin cells and enteric nerves. Some serotonin-releasing neurons also release acetylcholine.\*\*
  - Selective serotonin reuptake inhibitor (SSRI) medication may be prescribed for constipation, though there isn't strong evidence supporting this practice. [Behind the Rx, individuals may have notably different serotonin sufficiency.](#)\*\*\*
- ❖ **Acetylcholine receptors in the smooth muscles of the GI tract further promote motility.**\*\*\*\* Other transmitters in the gut interact with acetylcholine to modulate movement through the GI tract. [Acetylcholine transmission requires a parasympathetic state.](#) When it is inhibited, motility can slow.
- ❖ **Methane gas** produced by some gut inhabitants (archaea) induces constipation through interactions with acetylcholine.
- ❖ An **interplay between serotonin, nitric oxide, and acetylcholine receptors** may further modulate transit time.#
- ❖ **Dopamine release** can inhibit acetylcholine release in the GI tract as well, providing an additional mechanism to slow GI motility.##
- ❖ **Epinephrine release has the capacity to slow gastrointestinal motility** via upregulated smooth muscle relaxation and decreased MMC. [Sympathetic N/S \(stress!\) is a common contributor to dysmotility.](#)
  - Slow COMT activity (requires methylation) can also impact motility due to poor epinephrine clearance.
- ❖ **GABA** in the ENS specifically modulates motility from stomach to ileum and peristalsis in the colon.###

\* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7880310/> \*\* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4477275/> ,  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5772764/> , <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4204412/> and  
<https://journals.physiology.org/doi/full/10.1152/ajpgi.00173.2019> \*\*\* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9440984/>  
\*\*\*\* <https://www.mdpi.com/1422-0067/24/7/6508> # <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4204412/>  
## <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5772764/> ### <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5772764/>

# Defining Constipation

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- ❖ A state of constipation, diarrhea, or normalized stools is a reflection of transit time, consistency, and ease of stool passage for full evacuation.
- ❖ **Transit time:** The length of time it takes from food to travel from consumption to elimination. **Ideal may be somewhere between 12 and 30 hours.**
- ❖ Constipation is a combination of symptoms including:
  - Infrequent bowel movements (<3/week) – **though is less than 1 daily BM really healthful or optimal?**
  - Straining or experiencing pain with stool passage
  - Hard, pellet-like, dry, or lumpy stools
  - Sensation of incomplete evacuation
- ❖ By the above definition, affects an estimated 16% of the adult U.S. population.\*  
Anecdotally in some FM practices, ~**40% of clients!**
- ❖ Arguably, the Ideal Bowel Movement?
  - 1-3 easily-passed stools daily
  - Little sustained aroma (e.g. H<sub>2</sub>S)
  - Medium brown in color
  - Long, log-like piece or few pieces (Bristol 3-5)
  - No discomfort, straining, or significant delay in defecation\*\*



# Conventional Constipation Triage Remedies and Alternatives



# Constipation: “It’s just a Motility Issue”

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❖ Common conventional view of constipation: **Poor movement through the GI tract.**

❖ **Interventions geared towards improving motility:**

- **Fiber supplements** (e.g. Benefiber, Citrucel, Metamucil). Typically feature high levels of soluble fiber to bulk up a stool, which triggers peristalsis to support complete bowel movements. Also often contains chemical, artificial flavors, colors, and/or preservatives that can promote immune reactivity in some.
- **Lubiprostone** (e.g. Amitiza). Secretagogue. Softens hard stools by releasing more sodium into the stool (thereby promoting more water flow into it as well). Often recommended in IBS and opioid-induced constipation. Causes nausea in 1/3 of users.
- **Linacotide** (e.g. Constella). Promotes more water secretion into colon directly and also reduces pain by desensitizing nerves. Often recommended in IBS. Very strong; can promote diarrhea.
- **Oral stool softeners** (e.g. MiraLAX, Colace). Softens hard stool by promoting water flow into colon. Safety in use with children still questioned.
- **Rectal stimulants** (e.g. Dulcolax). Triggers peristalsis artificially to move stool out of rectum.
- **Oral stimulants** (e.g. Senekot). Often irritates the intestinal lining, causing a laxative effect.
- **Serotonin type 4 receptor agonist medications** (e.g. Prucalopride). Prokinetic that activates serotonin receptors to stimulate peristalsis.\* More commonly used in those for whom laxatives are ineffective.
- **Cholinesterase inhibition** (Pyridostigmine). Used in diabetic patients with autonomic neuropathy with otherwise intractable constipation\*\* via inhibition of acetylcholine degradation.

❖ **Electrolyte imbalance** is a concern with long-term use of any laxative that artificially affects water movement into the colon.

For more on conventional management of functional constipation, please see <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8073140/> and [https://www.gastrojournal.org/article/S0016-5085\(23\)00513-9/fulltext](https://www.gastrojournal.org/article/S0016-5085(23)00513-9/fulltext)

\* <https://www.ncbi.nlm.nih.gov/books/NBK548948> \*\* <https://link.springer.com/article/10.1007/s00125-015-3828-9>

# Natural Solutions For the Occasional “Clean Out”

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- ❖ **Natural chewing gum with Xylitol.** Sugar alcohol (and the only one that will typically not aggravate IBS) that also loosens stools gently.\* Chewing action stimulates digestion and might impact motility.\*\* Xylitol is a natural antimicrobial and helps to clean teeth in between meals. Use frequently.
- ❖ **Prunes.** High in stool-loosening sugar alcohol (e.g. sorbitol) and polyphenols. No long-term side effects (but be careful with diabetics). Significant benefits including fiber, vitamins, minerals, and phytonutrients. Consume 5 at night before bed and, if needed, 5 the next morning. Drink with plenty of water for maximum effect. Moderate, effective for most. Not appropriate for known IBS or SIBO.
- ❖ **Magnesium citrate or oxide.** 300-600 mg. Caution for those with kidney disease or who are using potassium-sparing diuretics.
- ❖ **Extra virgin olive oil.** Consume 3-4 Tbsp (mixed in with yogurt or small smoothie) at night prior to bed. If necessary, repeat midmorning the following day. Intense and effective from both polyphenols and fat concentration. Not for those with gallstones or bile duct congestion.
- ❖ **Vitamin C,** e.g. 2,000 mg.
- ❖ **Stimulant herbal formulas** usually feature senna, cascara, and/or cape aloe (with no artificial/chemical additives). Intense and effective.

# But What's Causing the Motility Issue?

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- ❖ **Quick-fix remedies don't address – much less resolve - the root cause!** Many of the prescribed constipation medications end up being used long-term despite U.S. FDA approval for short-term use only.
- ❖ Even the more natural intervention options do not address targeted root causes.

Constipation is a Symptom of functional imbalances, usually the result of multiple factors.

- ❖ Constipation and dysmotility are frequently evidence of dis-ease in the GI tract (and perhaps elsewhere, having systemic effects!).
- ❖ **An understanding of the Entirety of the patient's symptoms, alongside a complete health history, dietary patterns, lifestyle habits, and, if available, lab data can help determine the most appropriate interventions for a particular patient.**
- ❖ Identify the roots of the systemic dis-ease driver(s) to have maximal impact on clinical outcomes and patient satisfaction.

Always ask:  
“Who is This Person?”

# Root Causes of Constipation



# 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 *Disease* does this person have?



# The Devil IS in the Detail: Ask the Questions!

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- ❖ Patients assume their constipation is just “typical” because *it is* typical for them, or because others have normalized their troublesome bowel habits.
- ❖ **Ask questions** to help them characterize it fully and help identify likely root causes for further investigation.
  - When did the constipation start? (e.g. after a round of antibiotics)
  - Typically, how often do you have some sort of bowel movement?
  - What is the texture like? Runny and unformed but sluggish? Dry, lumpy, and hard?
  - How often do you strain (clench your anus) when passing a stool?
  - How often do you feel that your bowels do not fully evacuate?
  - Is there anything that you successfully use to promote a full bowel movement? How often?
  - Does it seem to follow a pattern? (e.g. worse when eating or NOT eating certain foods?)
  - Do you regularly consume fiber sources (e.g. fruits, vegetables, nuts/seeds, beans, whole grains)? Every day? How many times in a typical day (not your “best” day)?
  - How much water do you drink in a typical day (not your “best” day)?
  - How many times have you taken antibiotics in your lifetime?
- ❖ Most importantly, ask your patient “**What do YOU think** is ultimately causing your constipation?” **Explicitly encourage them to share things that might seem strange or “out there.”**



# Top 15 Root Causes of Constipation - 1



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Constipation is the potential result of many different dis-ease dynamics within the body:

## 1. Dietary & nutritional imbalances, e.g.

- a. **Insufficient electrolytes** (excessive need, poor or excessive intake driving mineral imbalances e.g. **magnesium** (perhaps driven by excessive vitamin D?), calcium (too much?), potassium), or **vit. B6**
- b. **Insufficient dietary fiber** (soluble vs. insoluble) and fruit (sorbitol, fiber, water)
- c. **Insufficient dietary fat**
- d. **Excessive sugar**, sugar substitutes or highly processed foods

## 2. Dehydration (poor water intake, **hypoadrenal/hypoaldosterone**, insufficient minerals)

## 3. Food sensitivities (especially to **cow dairy**), **allergies, intolerances\***

## 4. **Gut Dysbiosis** (especially low *Bifidobacteria* spp. and elevated *Bacteroides*, fiber intake, antibiotics) and **microbial byproducts** (e.g. methane gas, lactate, H<sub>2</sub>S, LPS, butyrate)\*\*

## 5. **SIBO/IMO** (e.g. *Methanobrevibacter* spp.)

## 6. Behavioral choices, e.g.

- a. **Poor eating hygiene** (e.g. insufficient chewing, eating on the run)
- b. **Lack of exercise** or poor muscle tone (mineral insufficiency, low ATP production)
- c. **Withholding stool** (small children that have been shamed, painful BMs, anal fissures, behavior/habit to use a certain restroom)
- d. **Poor sleep quality\*\*\***

\* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8955686/> and <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10015765>

\*\* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6379309/> , <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6663118> , and <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4951383> \*\*\* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9301120/>

# Top 15 Root Causes of Constipation - 2



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7. **Digestive secretion insufficiency** (stomach acid; pancreatic, salivary, brush border enzymes; bile)
8. **ENS Dysfunction: Damaged migrating motor complex and impaired peristalsis** (head injury, post-stroke, brain disease, food poisoning, **insufficient B12** or magnesium e.g. from low stomach acid, iron supplements, grazing, food sensitivity or intolerance e.g. dairy, poor cellular energy generation from statin drugs, hypothyroidism, toxicity, adrenal fatigue)
9. **Autonomic nervous system function, sympathetic dominance (vagal tone\***, stress perception/poor stress management, anxiety, disordered breathing)
10. **Adrenal dysfunction** (high OR low cortisol, **stress perception**/poor stress management)
11. **Hypothyroid state\*\*** (autoimmune dis-ease; low Free T3; poor T4 to T3 conversion)
12. **Insulin Resistance and Hyperglycemia** (diabetic autonomic neuropathy)
13. **Hormone imbalance**, e.g.
  - Gastrointestinal (e.g. cholecystokinin, secretin, motilin)\*\*\*
  - Metabolic (e.g. thyroid, cortisol)
  - Sex hormones (e.g. progesterone, estrogen)
14. **Insufficient Serotonin synthesis/action** (gut dysbiosis, enterochromaffin cell damage, vitamin B6 insufficiency, medication-driven/ongoing use of SSRIs)
15. **Medication side effects** (e.g. opioids, NSAIDs, iron, aluminum antacids, calcium channel agonists, antihistamines, anticholinergic drugs, oral contraceptive pills, SSRIs)

\* <https://insight.jci.org/articles/view/150052> \*\* <https://www.nature.com/articles/s41598-021-89378-y>

\*\*\* <https://gastrores.org/index.php/Gastrores/article/view/1219/1232> provides an excellent overview of gastrointestinal hormones and their action .

# Magnesium Insufficiency

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- ❖ 48% of Americans of all ages are estimated to be truly deficient in magnesium\*; many more have insufficient levels.\*\*
  - Only ~50% of Americans even consume sufficient magnesium per Estimated Average Requirement for a healthy adult\*\* (and is this amount even sufficient for “optimal” health?).
  - Those struggling with dis-ease may be disproportionately deficient in magnesium (e.g. HTN, CVD, T2D, osteoporosis, migraines).\*
- ❖ Participates in ~300 biochemical reactions in the body\*, most of which promote relaxation, whether it's in the head, heart, or gut.
- ❖ Where possible, encourage clients to get magnesium lab work...
  - Especially if other symptoms are present e.g. headache, tight muscles.
  - Specify **RBC Magnesium**, not serum! Want to be at least in upper half (or third!) of TRR for adequacy.
- ❖ Those using PPIs or other acid suppressants for longer than a couple of months likely have insufficient magnesium.\*\*\* H2 histamine blockers and diuretics may also be culprits.
- ❖ Type matters! Oral **Mag Citrate** and **Oxide** and transdermal **Mag Sulfate** (Epsom salts) will be most stimulatory to bowels (though oxide in particular may be poorly absorbed and thus not helpful systemically). Too much will cause short-term diarrhea (and deplete nutrients, including magnesium).
  - Look for citrate and oxide capsules vs. tablets for higher quality. Start with 300 mg once daily with food; if needed, add a 2nd dose with a different meal. In general, mag oxide is more aggressive and likely poorly absorbed systemically.
- ❖ **Avoid magnesium carbonate-only tablets** (e.g. mainstream drugstores).
- ❖ Use caution in magnesium supplementation for those with overt kidney disease/dysfunction or who are taking potassium-sparing diuretic medication. Start low'n'slow (~100 mg/day) and monitor well.

\* per data collected 2013-2016: <https://ods.od.nih.gov/factsheets/Magnesium-HealthProfessional/> \*\* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5786912/>

\*\*\* [https://journals.lww.com/md-journal/fulltext/2019/11010/proton\\_pump\\_inhibitors\\_and\\_hypomagnesemia\\_a\\_112.aspx](https://journals.lww.com/md-journal/fulltext/2019/11010/proton_pump_inhibitors_and_hypomagnesemia_a_112.aspx) and <https://jphcs.biomedcentral.com/articles/10.1186/s40780-022-00266-7>

# Foundational, Helpful, But Often Not Enough

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Assess each client's unique diet!

## Fiber

- ❖ **Soluble fiber bulks up a stool** to allow it to retain more water. **Insoluble fiber moves a stool along the GI tract.** Often found together in plant foods.
- ❖ Found in all fruits, veggies, nuts, seeds, whole grains.
- ❖ Perhaps especially **helpful for hard, sluggish stools**: chia seeds, ground flaxseeds, psyllium husks, okra, banana, avocado, peeled apples, beans (all high in soluble fiber).
- ❖ U.S. dietary guidelines around fiber are **confusing and not high enough to be optimal for most!**
  - 25 g fiber/day for children
  - 29 g/day for women
  - 38 g/day for men



## Fat

- ❖ **Sufficient dietary fat is important to help lubricate the stool for passage.**
- ❖ Excessive or poorly digested dietary fats may promote pathogenic, inflammation-promoting bacteria.
- ❖ **Caution with higher-fat diets for those with a missing gallbladder or active gallbladder disease.** Especially, avoid heavy olive oil intake for those with gallstones or bile duct congestion.
- ❖ **Many healthy fat options!** Olives and olive oil, coconut oil, avocado and avocado oil, nuts and nut butters, grass-fed organic butter or ghee, salmon, halibut, sardines, anchovies, and organic eggs are some great sources.



## Water

- ❖ **The colon absorbs more water the longer stool sits. Insufficient water makes stool sit longer.**
- ❖ Many Americans are chronically dehydrated for a large variety of reasons.
- ❖ **Water should ideally be consumed throughout the day,** not chugged a few times during meals.

# The Stars of the GI Tract: Our Microbial Friends

- ❖ We have **many trillions of microbes** within us! Together they are usually the largest “organ” in the GI tract (~ 3 lbs. of microbes).
- ❖ Several hundreds of different species (bacteria, archaea, yeast/fungus, parasites, viruses, bacteriophages) all competing for space and food and nutrients. And survival.
- ❖ Beneficial microbes eat residues from our diet (e.g. fiber, mal-digested protein or starches, sugars), **secrete vitamins & beneficial fats (SCFAs)**, nurture the colonic lining, and release anti-inflammatory molecules into systemic circulation.
  - **Dietary fiber is good prebiotic food** for beneficial species, especially garlic, onions, legumes, bananas, asparagus, beans, and dairy and wheat if tolerated. On supplements, prebiotics may be labeled “FOS (fructooligosaccharides) with Inulin” or “GOS” (galactooligosaccharides), or simply just “prebiotics.” Sometimes combined with probiotic formulas.
- ❖ Balanced gut bacteria help to **keep the immune system balanced**, appropriately tolerant, and neither under- nor over-reactive (e.g. allergy, asthma, arthritis, or auto-immune illness).
- ❖ **Beneficial gut bacteria in the right proportions modulate gut pH and oxygenation**, inhibiting pathogenic microbes and limiting their toxic metabolites. Oral antibiotics will destabilize this careful balance – often dramatically and for quite some time!
- ❖ **Toxic microbial byproducts (e.g. from *Candida*, methanogens, etc.) can break down the mucosal layer**, while beneficial bacteria (e.g. *Lactobacillus* spp., *Akkermansia mucinophila*) support mucus production and mucosal integrity. **Demulcent herbs** can help to restore this protective lining (e.g. slippery elm, marshmallow root, aloe vera).
- ❖ **Methanogens (e.g. *Methanobrevibacter* spp.) also produce methane gas, which on its own can decrease motility.** Methane also decreases endogenous serotonin production, further slowing motility through the small and/or large intestines, depending on the location of the overgrowths.\*

# The Wisdom of Well-Chosen Probiotics

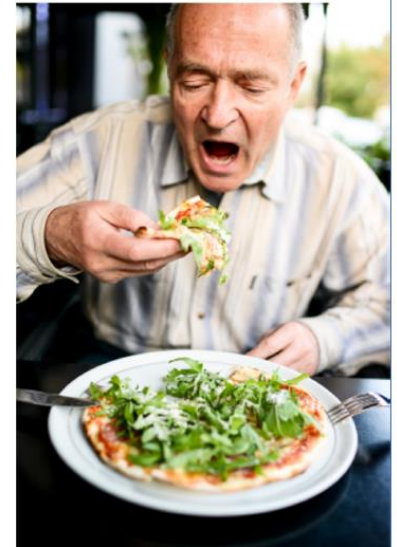
30

- ❖ **Supplemental beneficial microbes.** Clinically shown to be effective for a **wide array of therapeutic uses**, most importantly for calming, rebalancing, and priming the immune system, supporting production of SIgA, and producing anti-inflammatory molecules.
- ❖ **Broad spectrum species formulas (8+ strains) or foods are likely best for most preventive, immune-priming purposes and digestive support.** Typically supplements contain individual species (e.g. *Streptococcus*, *Saccharomyces*) or a blend of very specific families of species (*Lactobacillus*, *Bifidobacteria*, *Bacillus* spp.).
- ❖ **Can be live/viable** (usually refrigerated), dead or lysed (usually not refrigerated). All are useful for the gastrointestinal tract and overall immunity, but live is best. Many probiotics can be killed off in stomach acid if not enterically encapsulated.
- ❖ **Introduction of probiotics may initially cause some bloating and flatulence.** Consider:
  - **Giving the body time to adjust.** Start with 10-20 Billion CFUs/day for first ~10 days to assess start-up symptoms (e.g. bloating, flatulence).
  - Using a formula **without prebiotics, at least in the beginning.** Work with them to increase prebiotics via food instead. Individual tolerance varies dramatically.
- ❖ Those who have **taken antibiotics recently** (or multiple times historically) are particularly likely to have dysbiosis and get constipation relief from probiotics for a few months and also short-term (~1 month) to build up the protective mucosal lining of the intestines. In this scenario, consider a probiotic with *Lactobacillus* + *Bifidobacteria* + *S. boulardii* for the former and a combination of mucilaginous herbs and L-glutamine for the latter.
- ❖ **Clients who are 60 years or older** or who have chronic constipation usually benefit the most from probiotics with higher levels of *Bifidobacteria* spp.

# The Medicine of Smaller, Slower Meals...

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- ❖ The stomach is the body's blender.
- ❖ If we overeat at any one time, there is not optimal room to blend our food well and break it down into smaller particles. This can cause:
  - Post-meal fatigue,
  - Belching,
  - Overly full feeling or poor stomach emptying,
  - Constipation
  - Malabsorption.
- ❖ It takes 15-20 minutes for hormone Cholecystokinin (CCK) to be released, which regulates hunger. Eating a longer, slower meal supports CCK release, which can also then help prevent overeating.
  - CCK is particularly upregulated by fat in our meal.\*
- ❖ **Stress impairs all digestive secretions.** This in and of itself can contribute to slower motility.  
**Chewing well and signaling CCK promotes motility.**
- ❖ **Help your patient to understand Eating Hygiene.** Identify alternatives to what they see as barriers to honoring time-while-eating as sacred time.
  - Chewing food thoroughly before swallowing (ideally until it's liquid).
  - Eating without multitasking, especially stressful tasks including driving.
  - Slow down and Breathe. Regularly.
  - Prioritize relaxed activities during the hour after each meal.
- ❖ **Teach: Chew. Breathe. Relax.**  
Engage the parasympathetic nervous system. **Consider the act of eating as not only self-care but perhaps a meditation in itself.**



\* <https://my.clevelandclinic.org/health/body/23110-cholecystokinin>

# ...And Make Those Meals “Real”; Don't Graze

32

- ❖ **Stomach distension (expansion) from a substantial meal stimulates ongoing waves of Peristaltic muscle action down the entire GI tract to push the food down.**
- ❖ Post-meal, a more significant wave called Mass Peristalsis occurs, which moves chyme in bulk into the large intestines and eventually into the rectum. Ongoing MMC cleansing of the intestines is key for microbial balance, but **it doesn't happen while we are actively digesting food!**
- ❖ An overnight fast of about 12 hours plus 4 hours in between meals is typically sufficient for the MMC to sweep debris from the GI tract, including translocated bacteria, and maintain appropriate bowel motility.
- ❖ Is your client grazing during the day because they are bored? Working from home with easy pantry access? Emotionally eating? Or perhaps **“just can't slow down for a meal”**?
- ❖ Or perhaps they have a **digestive deficiency** that makes them want to eat less at once?
  - Digesting food well (from adequate digestive secretion release) requires a **dominant parasympathetic nervous system.**
  - Sympathetic nervous system activation (e.g. **rushing, exercise, exertion, manual labor, heightened emotions, stress**) can lead to impaired digestion, bloating, nausea, and nutrient malabsorption.
  - **What “Primary Food” emotional needs are in the way** of each unique client valuing intentional eating as self-care? And believing that they deserve that care?



# The Nervous System Impacts Motility

## ❖ Sympathetic

- Fight-or-Flight-or-Hide.
- Increased focus and alertness.
- Increased metabolic activities to prepare body for emergency activity.
- **Constipation may occur.\***
- 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.

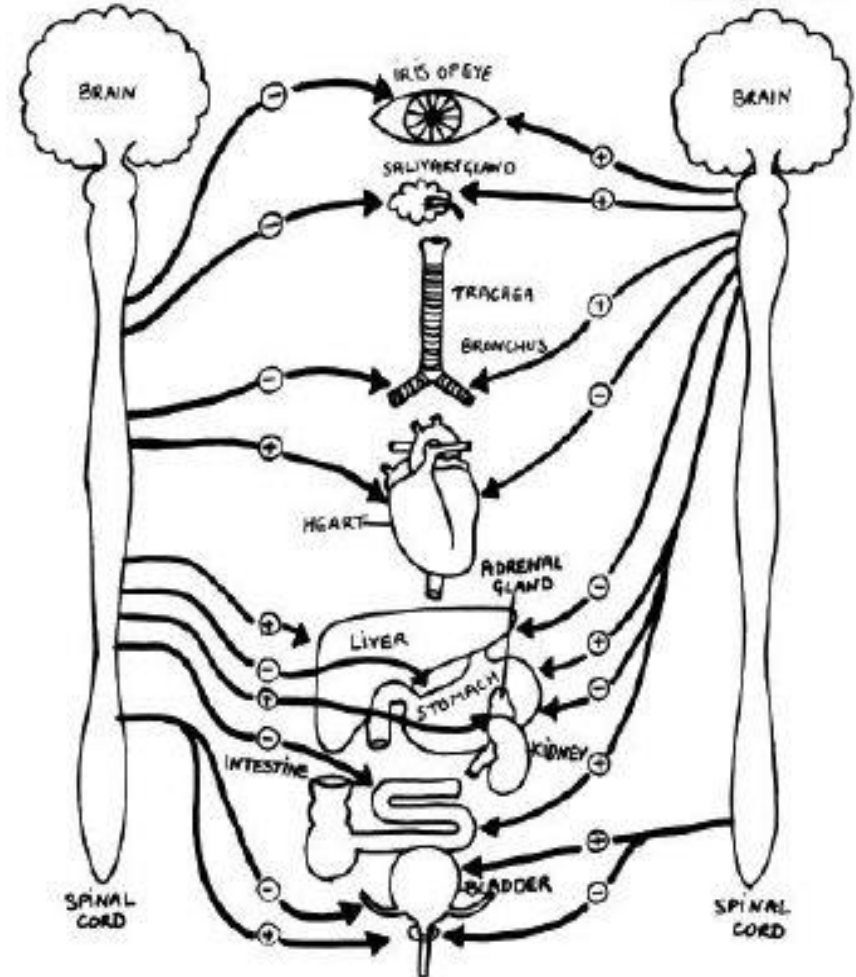
- **Constipation may also occur.\***
- Designed to be our primary state.
- ❖ Most organs and glands in the body have receptors to **receive impulses from both modes** (either inhibitory to “stop work” or stimulatory to “work harder”).



the sympathetic nervous system



the parasympathetic nervous system



(+) increased muscle contraction and gland secretion

(-) decreased muscle contraction and gland secretion

# Stress Hormone Interconnectedness

34

## Elevated Cortisol

### (Hyper-stimulated Stress Axis)

- ❖ Hypervigilant
- ❖ Overly alert, doom'n'gloom preoccupation
- ❖ Insomnia (racing mind)
- ❖ Poor digestion, “irritable” gut
- ❖ **Hypertension**, Racing heart
- ❖ Lower bone density
- ❖ Depressed immune system (may get sick easily)
- ❖ Anxiety (often along with Depression)
- ❖ “Wired and Tired”
- ❖ Here you will find some patients with chronic Anxiety, T2 Diabetes, Metabolic Syndrome.  
**Higher fasting glucose?**
- ❖ Consider: **Sympathetic Dominance**
- ❖ Often higher sodium and lower potassium, perhaps high chloride in some
- ❖ **Perhaps Weakened immunity**

Unabated  
Stress

## Depressed Cortisol

### (Under-stimulated Stress Axis)

- ❖ Exhaustion, perhaps debilitating fatigue (not recoverable with short-term increase in sleep)
- ❖ Lethargy, Malaise, Depression
- ❖ Weakness, myalgia, pain, inflammation
- ❖ **Hypotension**, dizziness upon standing, POTS
- ❖ Hypoglycemia
- ❖ Low pulse rate
- ❖ Low motivation
- ❖ Here you will find some patients with PTSD, allergy/asthma, chronic autoimmune disorders, pain disease (CFS, Fibro), postpartum depression.  
**Lower fasting glucose?**
- ❖ Consider: **Parasympathetic Dominance**
- ❖ Often higher potassium and lower sodium, perhaps lower chloride in some
- ❖ **Perhaps Dysregulated immunity**

← **Fatigue, Mood swings, Poor sleep, Hypothyroid function** →

As purposeful, regulatory, self-preserving action IN THE BRAIN, not intrinsic adrenal dysfunction!

# Chronic Adrenal Gland Activation

35

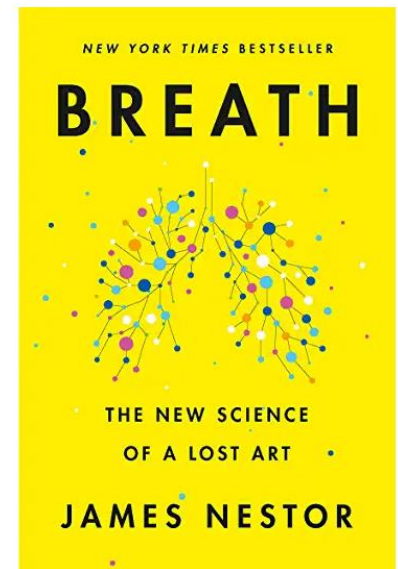
- ❖ **Emotional stress** (especially the combination of possible/actual harm and loss of control):
  - Work performance, family dynamics, finance issues, peer approval, etc.
  - Grudges, resentment, unalleviated anger, living in the past, unexpressed emotions.
  - Preoccupation with what is missing, 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. perhaps caffeine\*\*, also 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 dietary carbs.**
  - Insufficient caloric intake (think of high exercisers) or **dietary carbohydrates** (for a unique person).\*\*\*
    - **Your clients who have adopted a low- or very low- or no-carb diet must have adequate fatty acid metabolism in order to thrive, which requires B vitamins and carnitine and healthy mitochondria. Some may thrive best with 30-40% carbohydrates vs. 15-20% (e.g. more winter squash, tubers, whole fruit). Paleo ≠ Low Carb.**

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

# Activating the Vagus Nerve & Parasympathetic Response, on Purpose!

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- ❖ Signal to the body that your world is safe, secure, and supportive. Meeting the required, daily minimal intake of the “other vitamins” e.g. Vitamin J (joy), Vitamin P (play), Vitamin Q (quiet), Vitamin T (touch)...
- ❖ **Mindful Breathing\***
  - Slow, less frequent. Pauses between inhalation/exhalation. Exhalation equal to or longer in duration than inhalation. Something not possible when you're running for your life!
  - Left-nostril breathing especially activates the parasympathetic nervous system.
  - Alternate-nostril breathing can balance the autonomic nervous system.
- ❖ **Peacefulmindedness.** Falling in love with everyone, with life.
- ❖ Smiling, laughing, hugging, snuggling, good sex
- ❖ Gargling, singing, yodeling, chanting
- ❖ Yoga, Taiichi, mild-to-moderate exercise
- ❖ Being relatively **cool/cold.**  
The kind that makes you feel cozy, not shivering.
- ❖ Meditation, **gratitude journaling**
- ❖ Acupuncture, massage, cranial-sacral therapy
- ❖ Pets, children, things that comfort, beauty, soothing.
- ❖ **Heart Rate Variability (HRV)** is a way for curious clients to explore their own functional balance.



# Thyroid Imbalance Puzzle Pieces

37

## Hypothyroid Function (reduced T3 receptor signaling)

### **Things are running too slowly**

- ❖ Often feel cold (all over), lower body temp
- ❖ Gain weight (or difficult to lose) despite dietary change (perhaps poor appetite)
- ❖ Increased LDL cholesterol
- ❖ Fatigue, Malaise, low energy
- ❖ Vasoconstriction, hypertension, bradycardia
- ❖ Thinning eyebrows (esp. the outer third)
- ❖ Lower bone quality (brittle, fracture risk)
- ❖ Constipation, GI dysmotility/IBS/SIBO
- ❖ Dry skin, weak fingernails, hair loss
- ❖ Anemia\*
- ❖ Rough PMS or menopause symptoms
- ❖ Infertility
- ❖ Low libido, depression, brain fog
- ❖ Frequent infection, poor wound healing

## Hyperthyroid Function (excessive T3 receptor signaling)

### **Things are running too intensely**

- ❖ Often feel warm or hot
- ❖ Increased weight loss
- ❖ Tachycardia, palpitations, arrhythmia
- ❖ Anxiety, nervousness
- ❖ Restlessness (can advance physically to include tremor)
- ❖ Irritability, fatigue
- ❖ Fatigue
- ❖ Low flow or no menstrual period
- ❖ Infertility, miscarriage
- ❖ Excessive sweating
- ❖ Trouble concentrating
- ❖ Thyroid eye disease
- ❖ Frequent (and perhaps loose) bowels

Consider using an analogy of a thermostat or an electrical “dimmer” switch for intracellular thyroid function, something that works along a continuum.

# Insulin Resistance, Diabetes, & Diabetic Neuropathy

38

- ❖ **Autonomic neuropathy (AN) from chronically elevated blood sugar** can be a systemic issue, impacting many organ systems including the gastrointestinal tract.
- ❖ **Consider oxidative nerve damage from sustained elevated blood sugars** (high carbohydrate intake, insulin resistance, poor sleep, high stress, etc.), alongside dietary choices with inadequate nutrients and antioxidants, high toxicity, and high demand overall on the antioxidant system (redox imbalance). **Including damage to the vagus nerve.**
  - **There is often devil-in-the-detail within case-specific details** (e.g. metformin intake for T2 Diabetes impairing B12 absorption which promotes neuropathy).
- ❖ Some people will experience subclinical AN within a year of a T2D diagnosis, and within 2 years of a T1D diagnosis.
- ❖ **Long-standing AN may create impaired GI motility issues due to nerve damage**, including gastroparesis and constipation (as well as diarrhea and fecal incontinence).
- ❖ **Consider gastroparesis when glucose control is poor** (affects 50% of those with AN). Remember: poor motility in the upper GI tract can decrease motility signaling further down.
- ❖ Besides blood glucose control, other factors impacting motility in those with AN include the microbiome, malabsorption, electrolyte imbalances, dietary choices and downstream nutritional sufficiency, and medications (e.g. glucagon-like peptide-1 analogues).

# Solutions for Dysmotility

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- ❖ **Absolutely essential for optimal gut function** e.g. assists digestion/absorption, regulates mucus levels and microbiome balance, accomplishes Phase 3 detoxification. Dysfunction contributes to everything from poor transit time (constipation/diarrhea) to SIBO/IMO (IBS) to pathogen infection to food allergy/sensitivity to inflammatory bowel disease.
- ❖ A combination of local **segment contraction, peristalsis, and MMC** (the migrating motor complex).
- ❖ All of these depend on the health of **overall muscle function** (magnesium), the **enteric nervous system** (serotonin), microbiome diversity/balance\* (prebiotics), **vagal transmission** (parasympathetic), and **thyroid function**\*\* (optimal intracellular T3). Dynamics as diverse as diabetic neuropathy, gastric bypass surgery, adhesions, antibiotic drug use, narcotic drug use, SSRI use\*\*\*, **acute or chronic stress**, and Ehlers Danlos syndrome can impair motility.
- ❖ **Motility is activated** via a rich interconnected mix of hormones (e.g. motilin\*\*\*\*), neurotransmitters (e.g. serotonin, acetylcholine), digestive secretions (e.g. bile), and microbial secretions.
- ❖ **Serotonin** depends on key nutrients, especially tryptophan, Vitamin B6, Folate, and iron. **Ongoing use of oral estrogen (e.g. combo contraceptives) may deplete activated vitamin B6.** 5-HTP (50-100mg, 1-2x/day) supplementation may be helpful.
- ❖ **Acetylcholine** depends on liver synthesis (Vitamin B5) and dietary intake (organ meats, eggs, animal proteins, mushrooms, legumes). Phosphatidylcholine supplementation may be helpful (500mg, 1-3x/day).
- ❖ **Nervous tissue function** requires **optimal Vitamin B12 status**, mitochondrial function (acetyl l-carnitine supplementation may be helpful) and antioxidant sufficiency (methylation? glutathione? Melatonin synthesis in gut requires serotonin.)
- ❖ **Bitter foods and herbs** stimulate motility e.g. ginger, gentian, artichoke (just prior to meals).
- ❖ **IBS patients have dysmotility** - lower MMC frequencies and, in particular, low/no Phase 3 MMC activity and then the gaseous secretions from the microbes worsen dysmotility.
- ❖ **Adequate GI transit time balances nutrient absorption with toxin excretion.** Diarrhea and Constipation are symptoms of dysfunction. Overlapping factors may be at play.
- ❖ All of this rich physiological/biochemical orchestration is triggered by **good eating hygiene** and frequent time spent in a **parasympathetic nervous system state.** Chewing, sleeping, laughing, relaxing, breathing, feeling peaceful.



\* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6314902/> , [https://www.cell.com/fulltext/S0092-8674\(15\)00248-2](https://www.cell.com/fulltext/S0092-8674(15)00248-2)

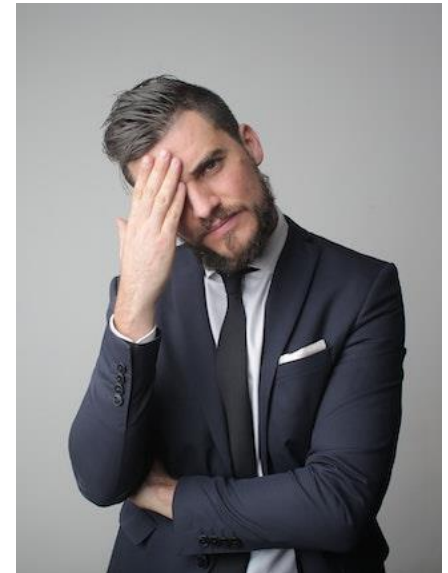
\*\* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2833301/> \*\*\* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5442087/>

\*\*\*\* [https://www.researchgate.net/publication/330560528\\_Motilin\\_from\\_gastric\\_motility\\_stimulation\\_to\\_hunger\\_signalling](https://www.researchgate.net/publication/330560528_Motilin_from_gastric_motility_stimulation_to_hunger_signalling)

# Mathematical Equations When Peeling the Layers

40

- ❖ Note that many people have **overlapping factors at play with dysmotility**. As you effectively address functional imbalances with them, **slowed or increased transit time (TT) may actually “appear” mid-program** because it’s the client’s true, underlying state that was being masked for a secondary factor.
- ❖ For example:
  - Hypothyroid function (slow TT) + Lactose intolerance (rapid TT) = optimal TT.  
**➡ A dairy-free diet might “create” constipation.**
  - Metformin-mediated diarrhea (fast TT) + SAD diet with no/low fiber (slow TT) = optimal TT.  
**➡ Increasing whole, fiber-rich foods in the diet might “create” diarrhea.**
  - This points to layers of the onion that have been peeled away (a clinical success! But also potentially concerning to the patient...) and points to the impact of multiple, interactive disease dynamics at play in a unique person. **Set expectations proactively!**



# Summary of Root Causes of Impaired Motility

41

- ❖ **Impaired motility and constipation are symptoms** of many upstream root causes, often a combination of several, interconnected factors.
- ❖ Treatment will warrant a variety of approaches depending on a person's bio-individuality. Again, ask, "Who is This person?"
- ❖ Top causes of constipation include:
  - **Dietary choices**, poor fiber intake
  - **Dehydration**
  - **Food reactions**
  - **Gut dysbiosis and microbial byproducts**
  - **SIBO/IMO**
  - **Behavioral choices**, poor eating hygiene
  - **Digestive secretion insufficiency**
  - **Enteric Nervous System dysfunction, Damaged migrating motor complex, and impaired peristalsis**
  - **Autonomic nervous system function, Sympathetic dominance**
  - **Adrenal dysfunction**
  - **Hypothyroid state**
  - **Insulin Resistance and Hyperglycemia**
  - **Hormonal imbalances** (e.g. menopause, pregnancy)(
  - **Insufficient Serotonin** synthesis/action
  - **Medication** side effects

# Resolving Constipation



# Deena's Solutions

43

## ❖ Diet & Lifestyle:

- Replaced baking with knitting hats for babies, to stabilize blood sugar
- Increased healthy fats and lean proteins
- Increased water and herbal tea intake
- Daily walking

## ❖ Supplements:

- Stopped vitamin D3 – **this immediately resolved the constipation**
- Repleted magnesium (Epsom soaks, magnesium citrate, magnesium glycinate) – it took 6 months before Deena could tolerate vitamin D supplementation at 1,000 IU / day without constipating
- Multimineral formula, blood sugar formula (MetaGlycemX), B complex, probiotic

❖ **Outcome:** Lost 43 lbs., A1c fell to 5.8% within a year, constipation resolved, total cholesterol fell to 213, aches and muscle tightness resolved, headaches resolved, GERD only occasionally, sleep improved most nights, stopped or tapered down on most Rx and OTC medications. Client was satisfied with outcome.

## Meet Deena

6



❖ 62 year old female whose husband just had a stroke and mother has dementia, so is concerned for her own health.

❖ **Current complaints:** morbid obesity, prediabetic, hypertension, hypercholesterolemia, aching knees and back, tight muscles, headaches, restless legs, GERD, constipation, poor sleep onset and wakes to urinate around 2 am.

- "I've been constipated for as long as I can remember, my momma even used to tell me that when I was a baby, I could go for a couple weeks without pooping."

❖ **Diet:** Consumes mostly meat and potatoes, occasionally some salads or frozen veggies. Loves to bake – often daily – to relieve stress. Insufficient water intake.

❖ **Rx meds:** Omeprazole 40 mg, Zofran 8 mg, Flexeril 10 mg, Tramadol 50 mg

❖ **OTC meds:** Docusate sodium stool softener 100 mg, antacid tablets (calcium), Aspirin 325 mg

❖ **Supplements:** Melatonin 1 mg, 5HTP 50 mg, vitamin D3 10,000 IU daily

# Natasha's Solutions

44

❖ **New SIBO/IMO test:** high hydrogen and methane gas spikes in small intestines

❖ **Diet & Lifestyle:**

- Space meals out to 4+ hours with 12+ hr. fast for migrating motor complex activation
- Stress management: breathing, transitioning between activities with a small break
- Eating hygiene
- Expand diet; higher FODMAP foods consumed with FODMAP-specific enzymes
- Aim for 7-8 hours of sleep on weeknights without blue light exposure
- Work with prescriber to optimize thyroid medication

❖ **Supplements:**

- Stop iron & betaine HCl with pepsin supplementation temporarily
- Allicin & oregano oil, partially hydrolyzed guar gum (PHGG), prokinetic (ginger), GI Detox, proteolytic enzymes, magnesium glycinate, FODMATE, broad spectrum digestive enzymes, spore-based probiotics, zinc, vitamins A, D (2,000 IU) with K2, B complex, P5P

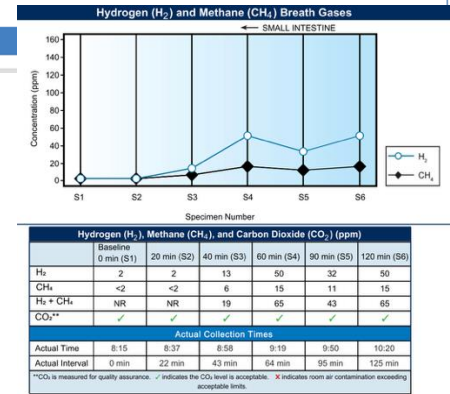
❖ **Mid-Program Outcome:** Stooling most days, no more embarrassing gas, notable stomach emptying and no nausea, family commented she looks thinner despite no weight loss, broader diet, fewer migraines, tolerating more foods comfortably

## Meet Natasha

7



- ❖ 43 year old female
- ❖ **Current complaints:** Constipation 10+ years (BM every 3-4 days, Bristol 2-3) with very occasional diarrhea, malodorous embarrassing gas, bloating and abdominal distension within 90 minutes of eating, heaviness/food sitting in stomach, nausea, occasional reflux, iron-deficient anemia, Hashimoto's thyroiditis, migraines, depression, anxiety
- ❖ High stress: 5 school-aged children, runs a small business, volunteers
- ❖ Sleeps 5-6 hours per night ("Ha, I don't have time to sleep!")
- ❖ **Key History:** Recurrent childhood strep throat, multiple ear infections treated with antibiotics, Group B Strep+ x3 births with IV antibiotics, history of yeast infections and thrush, Lactulose SIBO breath test 3 years ago was positive and treated with 14 weeks of rifaximin
- ❖ **Diet:** Low FODMAP diet for the last 5 years out of habit (overall diet mostly chicken, beef, eggs, broccoli, cauliflower, greens salad, bread, yogurt), is afraid to reintroduce various FODMAP foods. Eats breakfast and lunch while driving or in-between appointments
- ❖ **Rx meds:** Synthroid 75 mcg, Zoloft 200 mg, Eletriptan PRN, Recently finished 2 mos Prevacid
- ❖ **OTC meds:** MiraLAX
- ❖ **Supplements:** Betaine HCl with Pepsin, Slow Fe 45 mg, vitamin D3 5,000 IU, grapefruit seed extract 125 mg, probiotics, FODZyme, MV



# Jay's Solutions

45

❖ **Supplements:** GABA, magnesium glycinate, Epsom soaks, B complex, zinc picolinate

❖ **Diet & Lifestyle:**

- Normalize dietary pattern to 3 meals per day using pre-made breakfast smoothie kits and lunch delivery services from pre-selected healthy restaurants, eliminate energy drinks and coffee (replaced with green tea with honey), water
- Eating hygiene, forced 20-minute lunch break
- Stress management: breathing, listening to music, playing guitar
- Daily exercise: walking around the office after eating lunch during weekdays and interacting with colleagues
- Behavioral therapy referral
- Vagus nerve exercises: loud humming, deep breathing, and rubbing toothbrush on hard palate daily, petting neighbor's dog, cuddling with child during visitation

❖ **Outcome:** increased appetite with regular pattern, able to recognize the benefit of taking a lunch break, gas and bloating mostly gone, hasn't vomited in months, satisfied daily bowel movements, reflux resolved, energy 7-8/10 most days, and lost 5 lbs.

## Meet Jay

9



- ❖ 33 year old male
- ❖ **Current complaints:** trouble falling and staying asleep (wakes midnight and 3 am), fatigue (6/10), low testosterone, hypertension and occasionally rapid heartbeat, "beer belly", poor appetite, occasional vomiting when very stressed, GERD, gas and bloating most days, has bowel movements 1-4x/week with incomplete evacuation
- ❖ Works as a lawyer for a big firm, wife recently filed for divorce and is fighting for full custody of 3 year old child
- ❖ Starts day with coffee while commuting; snacks at his desk on donuts and chips found around the office washed down with 1-2 energy drinks until a late lunch at 3 pm; returns home around 7:30 pm
- ❖ **OTC medications:** Tums, Prevacid as needed

# Final Practical Thoughts for Practitioners



# Constipation is ~~Not Fun~~ Dangerous!

47

- ❖ One of the top patient/client complaints.
- ❖ Often chronic, including since childhood or infancy.
- ❖ Can create or contribute to Many disease dynamics!

## From annoying...

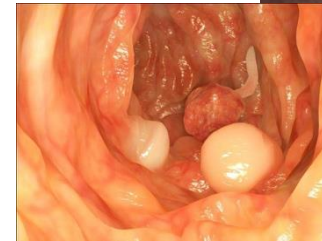
- Decreased quality of life
- Hemorrhoids
- Bowel Incontinence
- Microbial Dysbiosis
- Bloating, Distention, Flatulence
- Cramping, Pain
- Fatigue, Malaise
- Headache\*

## ...to debilitating...

- Food allergies\*\*
- Asthma\*\*\*
- Hormonal Imbalance
- Diverticulosis, Diverticulitis
- Toxin Reabsorption (contributing to almost any chronic inflammatory disease)
- Autoimmune disease
- Cognitive Decline\*\*\*\*
- Anxiety, Depression#
- Inflammatory bowel disease

## ...to life-threatening!

- Coronary Heart Disease##
- Colon and Breast Cancers##
- Ischemic Stroke##
- Increased risk of All-Cause Mortality##



# Thank you for joining us!



THE SCHOOL OF  
*Applied* Functional Medicine™

## SAFM's Practitioner Training Programs

- ❖ **Comprehensive.** The only program providing **the rich Science** of functional physiology, **the Art** of nuanced Clinical Application, continuous real-life **Case Practice**, and Business education/mentoring for **Career Success**.
- ❖ **Inclusive and diverse.** Warm, multi-modality community and collaboration among active practitioners.
- ❖ **Scientific rigor.** Accredited continuing education. To convey rich understanding, not high-level summaries. Curated published research. *Over 240 hrs curriculum education available.*
- ❖ **Practical application know-how** of functional medicine science, including the critical *“devil in the detail”*. A strong focus on the art of facilitating lifestyle change, a necessity for sustainable, optimal clinical results.
- ❖ Practice via **real-life, complex case exploration**. Over and over again! Build understanding and confidence by Doing. *Over 150 hrs of real-life complex case practice.*
- ❖ **Flexible delivery** to meet your unique needs (timing, formats, approach). Largely self-paced. **All-inclusive, affordable monthly tuition.** New cohorts seasonally.

## Our Practitioner Family

- ❖ Diverse, global (73+ countries), multi-modality (22+).
- ❖ Warm, supportive, engaged, respectful, collaborative.
- ❖ Longstanding and committed, growing since 2011

# Next Steps for You



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- ❖ **Enrollment is open** for our next cohort!
- ❖ Learn about our **accredited practitioner training experience**:  
<https://schoolafm.com/our-program/>
- ❖ Learn more about our programs with the **SAFM Overview**:  
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- ❖ Learned about our programs and still have questions?  
Book a convenient time to **speak with one of our Advisors**,  
all of whom are active practitioners and SAFM students as well:  
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- ❖ Ready to enroll and **start learning right away?**

