

Introduction to Integrative Gastroenterology

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OVERVIEW

- | | |
|---|---|
| 1
GI tract is the engine for your entire body | 3
Health of our cells & organs depend on the nutrients and energy extracted in the GI tract |
| 2
Specialized system with specific roles | 4
What you can't see may be more important than what you can see |

Find the root cause
Food as medicine

Upper GI Tract

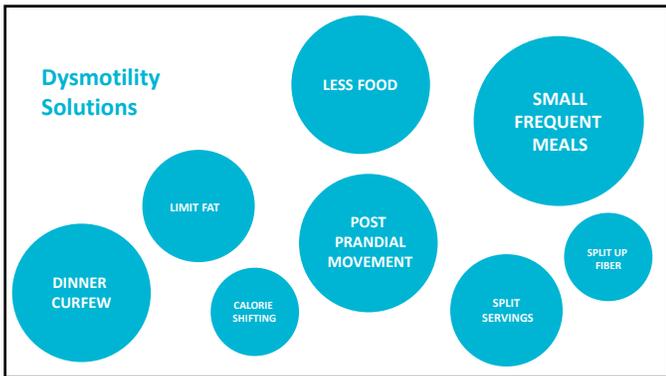
1 Importance of stomach acid <ul style="list-style-type: none">• Optimal pH• Balanced microbiome	2 Reflux <ul style="list-style-type: none">• Inappropriate opening of LES• Too much, too late, too sedentary• Caffeine, alcohol, nicotine, fat
3 Delayed gastric emptying <ul style="list-style-type: none">• Circadian rhythm	4 Digestive enzymes <ul style="list-style-type: none">• Food over supplements (every time!)

Case study #1

Deborah had been complaining of severe bloating, abdominal pain, and heartburn for a few months, which was worse after meals. She had tried over-the-counter antacids and prescription acid suppressors to no avail. She didn't have any of the common risk factors associated with acid reflux that cause heartburn: she was a nonsmoker, didn't drink caffeine, and wasn't overweight. Her job with a large international bank meant lots of time sitting in meetings, but she went running every evening after work and did yoga on the weekends. Dinner at around nine p.m. was her main meal, since breakfast was light and lunch nonexistent. Her upper endoscopy was very abnormal.

Gastroparesis

- Symptoms**
 - Bloating
 - Post-prandial pain
 - Early satiety
- Gastroparesis/reflux overlap**
- Mechanical/metabolic factors**
- Dysmotility**
- Lifestyle modification vs. drugs**



Case study #2

Annie is a wisp of a woman who's been terribly bloated and constipated for as long as she can remember. Two tablespoons of psyllium husk (soluble plant fiber that adds bulk to the stool) and one tablespoon of ground flax seed in the morning, followed by two capfuls of a polyethylene glycol osmotic cathartic (a powerful laxative), plus three stool softeners and six prunes at night- and she still has difficulty having a bowel movement. She's had several visits to the emergency room after nearly passing out from abdominal pain. Each time, the main finding on X-ray was a colon full to the brim with stool. We take a dietary history. Impeccable: she's quasi-vegetarian and her standard lunch is brown rice, lentils, and kale.

The Voluptuous Venus Colon

- Longer colon
- Rounded, deeper pelvis
- Reproductive organs
- Hormonal differences
- More constipation and bloating!

Constipation

- 1 Symptom not a disease
- 2 Multifactorial
- 3 Treat underlying cause
- 4 "Obstructed defecation" most common
- 5 Understanding "alternators"

Causes of Constipation

- Anismus/pelvic floor
- Colonic inertia (slow transit/dysmotility)
- Dehydration
- Depression
- Diet
- Diverticulosis
- Dysbiosis
- Gluten intolerance
- Holding
- Hormonal changes
- Lifestyle (sedentary)
- Mechanical: fibroids, endometriosis, scar tissue
- Medications
- Neurological causes
- Rectal prolapse/rectocele
- Voluptuous Venus colon

Constipation Solutions

- CHANGE YOUR POSITION
- CLEAN OUT THE MEDICINE CABINET
- DRINK MORE WATER
- GET ACTIVE
- TRAIN YOUR COLON
- TRY BIOFEEDBACK
- CONSIDER A FIBER SUPPLEMENT

Case study #3

My patient Barbara is a fifty-seven-year-old who in the last several years has been very careful about her food: no trans fats, nothing processed, no red meat, organic fruits and vegetables, and at least 20 grams of fiber a day. Given her healthy eating habits, she was perplexed as to why she was spending the better part of her day in the bathroom. Having a bowel movement had become a full-time job. The morning would get off to a reasonable start: a smallish log right after her morning tea, but things would deteriorate steadily after that with multiple, small, stuttering, pellet-sized poops that looked like rabbit droppings. Each movement was accompanied by a feeling of incomplete emptying. She could feel she had more stool inside, but she couldn't get it to come out. Invariably, within half an hour, it was back to the bathroom for more unsatisfying action.

Diverticulosis

- Symptoms:
 - Bloating
 - Irregular bowel movements/constipation
 - Incomplete evacuation (tenesmus)
 - Schmeary stool
- Frequently misdiagnosed as IBS
- Overlap with urinary symptoms
- Processed fiber vs. indigestible fiber

Case study #4

Rose was in a big hurry when she came to see me. Gallbladder surgery was looming on the horizon and she needed answers fast. As I read through her initial food journal that I have new patients fill out, I tried to maintain a neutral expression: a cheese Danish with a latte for breakfast, a turkey and provolone sandwich for lunch, a steak, chicken, or cheese pasta for dinner, with ice cream for dessert. Occasionally she'd have an apple for a snack, but usually it was a chocolate bar, cookies, or frozen yogurt. By way of explanation, she told me that her husband didn't like vegetables and her daughter was a picky eater, so they invariably ended up eating a lot of high-fat foods that appealed to everyone.

The Gallbladder

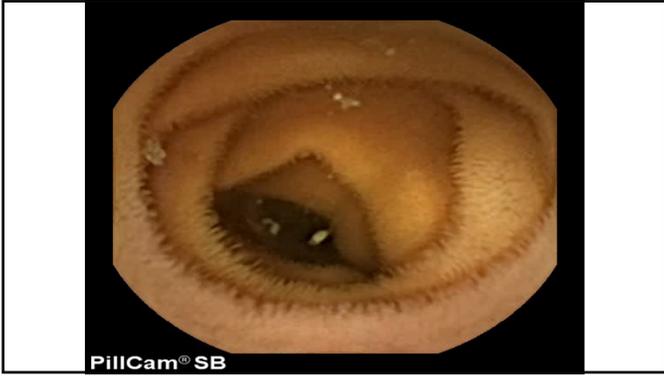
- Food gets churned up into chyme in the stomach
- Chyme travels to duodenum
- Duodenum releases cholecystokinin (CCK)
- CCK stimulates gallbladder to release bile
- Bile emulsifies fat to assist with absorption
- High fat meal – more bile release
- Low fat meal – less bile release
- Function is based on feedback loops

Gallbladder Dysfunction

- 1 Acute gallbladder infection or inflammation (acute cholecystitis)
- 2 Chronic gallbladder dysfunction (cholecystopathy)
- 3 Gallstones

Parasites

- Tapeworms, roundworms, protozoa
- Pathogens versus commensals
- Can be markers of dysbiosis
- Often not the actual cause of symptoms
- *Blastocystis hominis*
- Healthy immune system is best defense





<h2>Gluten</h2>	<ul style="list-style-type: none">• Celiac disease• Gluten sensitivity• Wheat allergy• Testing<ul style="list-style-type: none">○ Serology○ Endoscopic biopsy of duodenum○ Empiric avoidance (and reintroduction)
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Celiac

- 1 in 4 of European ancestry
- Genes not sufficient
- Immune system trigger
- Strongly associated with antibiotics

People with celiac disease 40% more likely to have received antibiotics shortly before diagnosis

Irritable Bowel Syndrome (IBS)

- Why is the gut irritable?
- Slicing up the IBS pie
- Role of stress
- Cause-based solutions

Causes of IBS

- Aerophagia (air swallowing)
- Antibiotic use
- Bacterial overgrowth (dysbiosis)
- Bile acid malabsorption
- Bile gastritis
- Carbohydrate malabsorption
- Celiac disease
- Constipation
- Crohn's disease
- Diet
- Diverticulosis
- Eating disorders
- Eosinophilic gastroenteritis
- Food allergies
- Fructose malabsorption
- Gallstones
- Gastroparesis
- Gluten sensitivity
- Helicobacter pylori
- Hormonal imbalances
- Infections
- Lactose intolerance
- Leaky gut syndrome
- Liver disease
- Medication side effects
- Motility disorders
- Microscopic colitis
- Parasites
- SIBO
- Stress
- Thyroid disorders
- Ulcerative colitis

Seriously Bloating

SIGNS

- Weight loss/gain
- Ascites
- Pain
- Bowel obstruction
- Bleeding
- Fever

CONDITIONS

- Cancer
- Liver disease
- Diverticulosis
- Pelvic inflammatory disease (PID)
- Crohn's disease

Leaky Gut

- Fishing net
- Increased intestinal permeability (IP)
- Compromised barrier function:
 - Heightened immune response
 - Food sensitivities
 - Suboptimal nutrient absorption
- Mechanism rather than diagnosis
- Fellow traveller with SIBO, NSAID damage, etc.
- Remediate underlying cause of gut damage



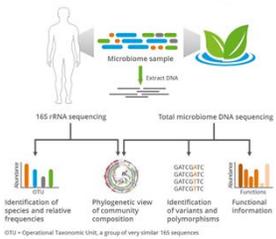
- 1 **100 trillion**
Number of microbes in the human body
- 2 **23,000 vs. 3.3 million**
Number of human genes versus microbial genes
- 3 **10 X**
Number of microbial cells versus human cells

Human Microbiome Project (2008)



- 1 **5,000** Biological samples of human and microbial DNA
- 2 **~90%** Of the human microbiome identified
- 3 **>10,000** Species of microbes represented

Rapid identification of microbes

OTU = Operational Taxonomic Unit, a group of very similar 16S sequences

What do our microbes do?



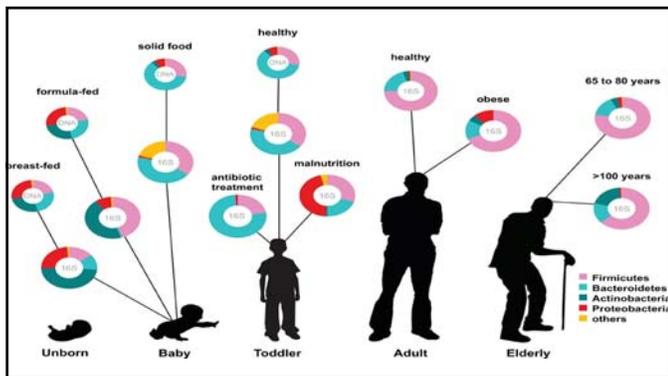
- Digest food
- Synthesize vitamins
- Metabolize drugs
- Neutralize toxins
- Train the immune system
- Turn genes on and off
- Influence disease

Differences in birth method

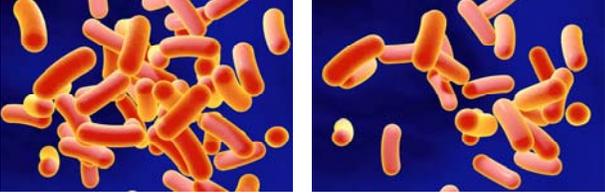
	C-section	Vaginal
Allergies	↑	↓
Asthma	↑	↓
Autoimmune diseases	↑	↓
Obesity	↑	↓

The Developing Microbiome





Antibiotic Use



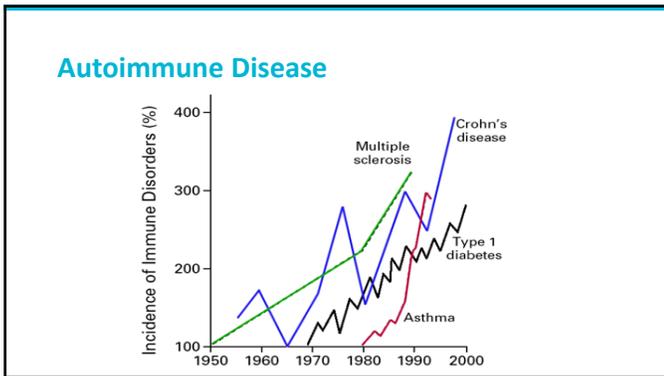
“Proton Pump Inhibitors Affect the Gut Microbiome”

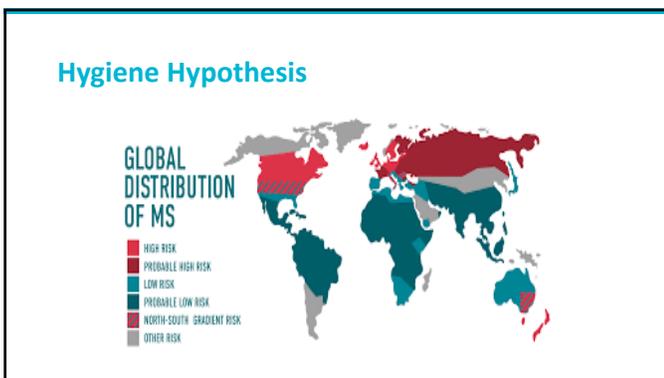
Gut 2015

- 2,000**
PPI and non-PPI users
- 20%**
Changes in bacterial taxa
Decrease in diversity
- Higher risk**
C. Difficile
Enteric infections

Dysbiosis

- SIBO misnomer (imbalance, not overgrowth)
- Causes
 - Drugs (antibiotics, PPIs, BCP, steroids, etc.)
 - Diet (high fat/low fiber, processed carbs)
 - Anatomy (diverticulosis, Crohn's, scar tissue)
- Perseverating on yeast overgrowth
- Role of probiotics and diet
- Remove, replace restore PROTOCOL





Inflammatory Bowel Disease



- 1 **Dysregulation** of mucosal immune system
- 2 **Inappropriate response** to commensal microbes

Genetic Basis for IBD

- > 100 host susceptibility loci
- Familial clustering
- Racial/ethnic differences
- Family history in 10-20%
- 10-fold increased risk in relatives

Consectetur adipiscing

Microbial Signature in Crohn's

- Increase in mucosally associated bacteria
- Decreased in microbial diversity
- Decreased production of butyrate

↑

Enterobacteriaceae
Adherent/invasive E. coli

↓

Clostridial group
Protective faecalibacterium

↓

Roseburia
Firmicutes

“Antibiotics associated with increased risk of new-onset Crohn’s disease”

American Journal of Gastroenterology 2014

- Meta-analysis
- 7,208 IBD patients
- Pooled odds ratio 1.57
- Risk of Crohn's in children markedly increased
- All antibiotics except PCN strongly associated

“Rural residence in early life associated with a lower risk of IBD”

American Journal of Gastroenterology 2017



Association strongest in

- Young children
- Small family size
- Early exposure to antibiotics

Association lowest in

- Children exposed to rurality in 1st 5 years
- Large family size
- Early exposure to animals

A Tale of Two Cities



“Impact of diet in shaping gut microbiota”

PNAS 2010

Comparative study: Italy vs. Burkina Faso

- European children consuming a Western diet:
 - Greater abundance of gram-positive bacteria (Firmicutes)
- African children – high fiber, vegetarian diet:
 - Greater abundance of Bacteroidetes
 - Higher microbial richness
 - More species diversity
 - Lower prevalence of pathogenic strains
 - High levels of SCA

“Diet rapidly and reproducibly alters human gut microbiome”

Nature, January 2014



- 9 volunteers
- 2 extreme diets, 5 days each
- High fat, low fiber Atkin’s: brisket salami prosciutto, cheese
- Low fat, high-fiber Vegan: jasmine rice, lentils, onions, tomatoes, squash, peas bananas, mangoes
- MB before, during, after
- Microbes shifted within a day, bile loving species – help break down fat, but associated with inflammation and colitis dominated on high fat diet
- Genes that were turned on changed

“Diet swap has dramatic effects on colon cancer risk for Americans and Africans”

Imperial College, London 2015

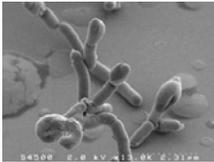
20 African Americans and 20 Africans (rural SA) swapped diets for 2 weeks

- American group on African diet
 - Less inflammation in the colon
 - Reduced biomarkers of cancer risk
- African group on American diet
 - Dramatic increase in cancer risk after 2 weeks

MACs



Faecalibacterium prausnitzii



- Protective role in metabolic diseases
- Strong correlation with SCFA production
- More prevalent in vegans (inulin)
- Associated with reduced risk for cardiovascular disease, colon cancer, diabetes, and obesity

“Effect of a low-complex carbohydrate diet on IBD”

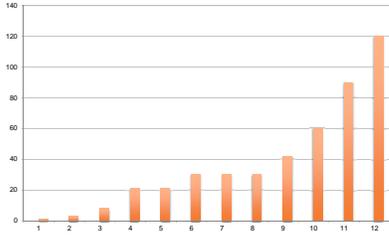
Chutkan, et al. DDW 2014

A retrospective review to assess the effectiveness of the Specific Carbohydrate Diet (SCD) in improving quality of life and reducing frequency and severity of flare-ups in patients with inflammatory bowel disease.

Patient Characteristics

Age range	16-69 (mean = 39.25)
Gender	9 female / 3 male
Diagnosis	2 UC / 9 CD
Avg # years of disease	2 – 23 (mean = 10)
Past surgery	5 out of 12 patients

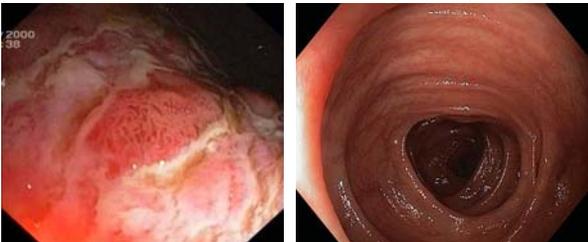
Time on Diet Before Improvement



Medication

Mean time on diet before improvement	38 days
# of patients able to stop or decrease medication(s)	7 out of 12 (58%)
# of patients able to stop medication(s)	5 out of 12 (42%)
# of patients able to decrease medication(s)	2 out of 12 (17%)

Endoscopic Results



Conclusions	<ol style="list-style-type: none"> 1 Nutritional therapy is a viable therapeutic option for management of IBD 2 Can result in improvement of symptoms, mucosal healing, and a reduction or discontinuation of medication 3 Direct correlation between improvement and the amount of dietary fiber consumed
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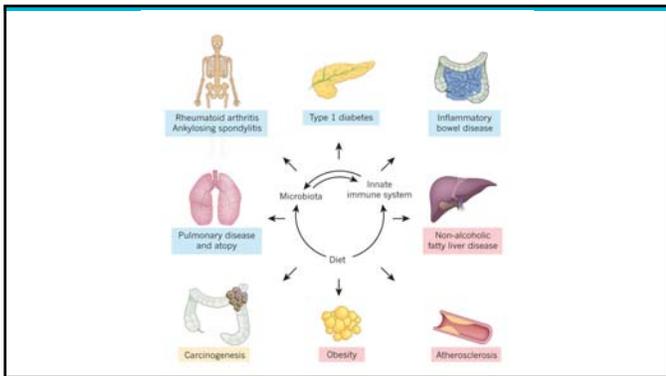
“VELEO” DIET <small>Vegan + Paleo</small>	Lots of high-fiber plant Matter in the form of fresh Vegetables and fruits
Microbe-boosting whole grains and legumes that contain food for our microbes to eat	The option of a small amount of protein and fat from animal sources

Emphasize these foods...	<ul style="list-style-type: none"> Fermented foods Onions Leeks Leafy greens Cruciferous veggies Garlic Asparagus (include stems) Broccoli (include stems) Artichokes Green bananas Chicory root Radicchio Carrots Radishes Tomatoes Dandelion root Parsnips Ginger Lemon Turmeric Coconut oil Ground raw flax seed
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In the last century...



- 1 **Dramatic decrease in** communicable diseases like measles, hepatitis, tuberculosis
- 2 **Dramatic increase** In non-communicable diseases Like Crohn's, celiac disease, and IBS
- 3 **The increase** In non-communicable diseases is tied to changes in the microbiome



Gutbliss.com

The image displays three book covers by Robynne Chutkan, M.D., FASCP, FASG. From left to right:

- Gutbliss: The Light, Tight, and Strong -- No Pleading Diet**: A 10-Day Plan to Ban Bloat, Flush Toxins, and Dump Your Digestive Baggage.
- THE MICROBIOME SOLUTION**: A Radical New Way to Heal Your Body from the Inside Out.
- THE BLOAT CURE**: A Must-Have Manual for Real and Lasting Relief.