



DR. HYMAN+

Naturopathic Approaches to Gut Health

Pedi Mirdamadi ND, MS, IFMCP

Why gut health is important

- Hippocrates once said “All disease begins in the gut”
- Dysregulation in the GI can have profound impact on health

Gut health is important for:

- Digestion and absorption of nutrients
- Microbiome involved in detoxification
- Microbiome influences blood sugar control
- Connection with brain through gut-brain axis
- Connection with nervous system through vagus nerve
- Influences inflammation and immune health through GALT

Digestive System Structure

- Digestion begins in the mouth (with chewing and saliva)
- Food then enters stomach where it is broken down (by stomach acid)
- Then enters small intestine where it is broken down further and absorbed (by digestive enzymes)
- Water and some vitamins are absorbed in large intestine



Key functional roles of the gut

- Digestion/absorption
- Intestinal permeability
- Gut microbiota/dysbiosis
- Inflammation /immune
- Nervous system
- Elimination of waste/detoxification

Conditions associated with an unhealthy gut

Dysbiosis

- A state of microbial imbalance related to the gut ecosystem
- When there is an overabundance of pathogens and/or a deficiency of the beneficial bacteria
- Results in nutrient deficiencies, inflammation, and digestive disorders
- Symptoms of dysbiosis include: bad breath, bloating, constipation, diarrhea, abdominal pain

Conditions associated with an unhealthy gut

Dysbiosis - SIBO

- Small intestinal bacterial overgrowth
- Condition when abnormally high amounts of bacteria move up from the large intestine into the small intestine
- Symptoms include: abdominal gas, bloating, constipation and diarrhea

Conditions associated with an unhealthy gut

Leaky gut

- Aka intestinal hyperpermeability
- Intestinal lining covers more than 4000 sq/ft in surface area
- Tight barrier that controls what gets absorbed into the bloodstream
- Unhealthy gut lining may have cracks or holes allowing partially digested food, toxins, and bacteria to penetrate and enter circulation leading to inflammation
- Can result in problems in digestive tract and beyond

Gut health and sleep

- Gut health connected to sleep quality
- Regulation of sleep-wake cycle
- Unhealthy gut contributes to disturbed sleep and insomnia

Gut health and immune function

- 70% of immune system in gut
- Imbalanced gut = imbalances immune system
- Bacteria within gut (microbiome) closely related to immune health
- Disruption of gut bacteria leads to problems including autoimmune disease, allergies, digestive disorders

Gut health and mood

- Gut referred to as second brain
- Vagus nerve connects the gut and brain (allows the influence of the gut on the brain and vice versa)
- Research demonstrates that an unhealthy gut is associated with depression, anxiety, and other mood disorders.
- Majority of neurotransmitters that play important role in mood made in the gut.

Gut health and skin

- Gut health have can significant impact on skin health
- Certain microbes in gut cause inflammation causing skin problems (acne, eczema, psoriasis)
- Imbalances in microbiome can result in skin infections

When to suspect digestive dysfunction:

- Bloating or belching following meal
- Flatulence after eating
- A sense of fullness after eating (early satiety)
- Undigested food in stool
- Iron deficiency and anemia
- Unintentional weight loss
- Chronic diarrhea
- Constipation

GI - Symptoms Questionnaire

- Nausea
- Vomiting
- Diarrhea
- Constipation
- Bloating feeling
- Belching (burping)
- Passing gas
- Heartburn
- Intestinal/stomach pain
- Frequent need to clear throat
- Food in the stool
- Mucus in stool
- Foul smelling stool

GI - Symptoms Questionnaire Scoring

- 0-10 Mild symptoms
- 11-20 Moderate symptoms
- 21-30 Severe symptoms

Risk factors

Method of Birth:

- C-section or bottle-fed - gut flora not develop
- Intestines are sterile in womb
- First place you acquire flora from is birth canal
- Vaginal fluid swallowed at birth, first bugs that colonize infants gut
- Infants delivered by C-section were deficient in a species of bacteria called bacteroidetes

Risk factors

Breastfeeding:

- Influences gut microbiome great source of bifidobacteria
- Breastfed appear to be protected against childhood obesity

Risk factors

Antibiotic use:

- Unnecessary use of antibiotics
- Average child receives one round of antibiotics per year and has received 10-20 courses of antibiotics by the age of 18
- Infants given broad spectrum antibiotics before the age of 2 have higher chance of becoming obese during childhood.

Risk factors

Standard American Diet:

- High sugar, fat, processed food diet reduces biodiversity in the gut microbiome.
- Changes can happen in as little as 24 hours

The Gut Microbiome

- Complex ecosystem of microorganisms
- Composed of viruses, bacteria, fungi
- Influenced by nutrition and lifestyle
- Connected to many aspects of health

More on the microbiome...

- Microflora in the gut weighs 2-5 lbs!
- Microbial cells outnumber human cells by 10x
- Microbial DNA outnumber human DNA by 100 to 1

Ways the microbiome serves us:

- Breaks down complex carbohydrates.
- Produce vitamins and minerals.
- Produce short chain fatty acids (SCFAs).
- Protection against pathogens.
- Influence immune health.
- Support detoxification.
- Influence the nervous system.

Healthy gut vs. Sick gut

- Poor diet
 - Dehydration
 - Medication
 - Infection
 - Low enzymes and stomach acid
 - Imbalanced ecology
 - Impaired intestinal permeability
 - Imbalanced nervous system
- Proper micronutrients, macronutrients, phytonutrients
 - Proper chewing
 - Adequate digestive juices, enzymes, and pH
 - Intact gut line barrier
 - Balanced ecology of bacteria
 - Balanced nervous system

Causes of poor digestion

- Poor dietary habits like food selection, meal timing, poor chewing
- Altered bowel transit time (rapid transit time and malabsorption d/t hyperthyroidism)
- Villous atrophy (brush border enzymes)
- Dysbiosis
- Low levels of stomach acid, saliva, bile, pancreatic enzymes
- Food allergies/sensitivities
- Pharmaceutical agents: acid blockers, laxatives.
- Travel - frequent flying disrupts microbiome
- Hypoxia

Maldigestion vs. Malabsorption

- Maldigestion refers to defective breakdown of nutrients
- Malabsorption refers to impaired mucosal absorption
- Common malabsorption is lactose intolerance d/t def in lactase.

SUPPORTING GUT HEALTH WITH NATUROPATHIC & FUNCTIONAL MEDICINE

Naturopathic & Functional Medicine approach to gut disorders

4 R approach to gut health:

- Remove - SAD, food triggers, toxins, excess bacteria
- Replace - stomach acid, enzymes, bile acid
- Repair - gut lining using targeted nutraceuticals
- Rebalance - nervous system through vagus nerve

Foundational steps to a healthy gut

- Avoid eating in a rush - chew each mouthful at least 30 times before swallowing
- Limit fluids intake to sips with meals - drink fluids at least 30 mins away from meals
- Avoid multitasking or eating on the go- pay attention to the site and smell of food
- Avoid eating large meals before going to bed

Step 1:

Remove - Standard American Diet

- Inflammatory fats and high sugar food adversely affect the microbiome quickly
- Shown to promote dysbiosis
- Disrupts gut barrier function
- Reduce microbial diversity
- Changing your diet you can change your microbiome!

Step 1:

Remove - Food triggers

- Foods that trigger the immune system causing inflammation
- Allergies (IgE response)
- Sensitivities (IgG response)
- Intolerances (lactose intolerance)
- Gluten, dairy, sugar, soy, eggs (for some), nuts (for some)

Step 1:

Remove - Toxins

- Toxins and metabolic waste byproducts are eliminated from body via stool
- Constipation or infrequent stools negatively impact detoxification
- Constipation allows toxins to spend more time in colon and increases likelihood of reabsorption
- Can overburden liver and detoxification pathways
- Result in bloating, brain fog, low energy, skin issues

What about fiber?

- Very important food for long term health
- Helps you feel full, is food for your flora, helps with stools, and cleanses your intestines
- Recommended daily intake is 25-35 g/day.
- Average American is getting 15 g/day.
- Limit fiber intake in phase 1.
- Fiber and prebiotics will be added back in phase 2

Step 1:

Remove - Excess bacteria

- 30 days high protein, low carbohydrate, low FODMAP diet.
- FODMAPs contain short chain sugars which easily ferment and can lead to symptoms like gas, pain, bloating
- Flora is comprised of communities of friendly organisms and potential pathogens
- Avoiding these foods removes the food sources that sustain the imbalance in microbial communities

Step 1:

Remove - Excess bacteria (cont.)

- Eat fewer FODMAPS
- Acronym for fermentable oligo-, di-, and monosaccharides (sugars) and polyols (sugar alcohols)
- Sugar alcohols commonly found in artificial sweeteners, such as xylitol, mannitol, and sorbitol.
- Highly fermentable foods that are not well absorbed in the small intestine
- Can cause several problems.
- Microbiota love to eat FODMAPs.

Step 1:

Remove - Excess bacteria (cont.)

- SIBO, candida and pathogenic bacterial overgrowth may require antimicrobials
- Support health gastrointestinal microbial balance
- Examples
- Berberine
- Black walnut
- Artemisinin
- Uva ursi

Step 2 - Replace

Adding back:

- Stomach acid
- Digestive enzymes
- Bile
- Friendly flora
- Strengthen and diversity your inner ecosystem by fertilizing it with special foods and supplements to microbiome to thrive
- Expand the populations of friendly bacteria
- Begin to increase carbohydrate intake through whole foods (fruits and vegetables high in insoluble fiber).

Step 2:

Replace - Stomach Acid

Role of stomach acid:

- Crucial role in digestion
- Begins breakdown of protein
- Important in absorption of minerals including:
 - Calcium
 - Iron
 - Zinc
 - Magnesium
 - Copper
 - Vitamin B12

Step 2: Replace - Stomach Acid

Signs of low stomach acid:

- Abdominal pain shortly after meals
- Bloating
- Gas
- Reflux
- Diarrhea
- Constipation
- Brittle hair
- Brittle nails

Step 2: Replace - Stomach Acid

Factors that increase hypochlorhydria (low stomach acid):

- Aging
- Stress
- Fasting
- H.pylori
- PPIs
- Antiacids

Step 2: Replace - Stomach Acid

Address with the following:

- Betaine HCl (stomach acid support)
- Digestive bitter herbs
- Minimizing stress
- Avoiding anti-acids
- Treating H.pylori
- Vagus nerve stimulation

Step 2: Replace - Pancreatic Enzymes

Role of pancreatic enzymes:

- Help break down fats, proteins, and carbohydrates
- Lipase breaks down fat molecules
- Deficiency can cause diarrhea or fatty stools
- Protease break down proteins and keep intestines free of parasites, yeast, and protozoa
- Deficiency can cause allergies, and increased risk of intestinal infections
- Amylase break down carbs (starch) into sugar
- Deficiency can cause diarrhea

Step 2: Replace - Pancreatic Enzymes

Signs of pancreatic insufficiency:

- Abdominal pain
- Weight loss
- Muscle wasting
- Fatty stool
- Malabsorption
- Vitamin deficiency
- Abdominal gas
- Abdominal bloating

Step 2: Replace - Pancreatic Enzymes

Factors that contribute to enzyme deficiency:

- Damaged microvilli
- Toxins
- Stress
- Nutrient deficiencies
- Alcohol abuse
- Oxidative stress

Step 2:

Replace - Pancreatic Enzymes

Ways to increase production of digestive enzymes:

- Digestive enzyme supplement
- Stress management/Vagus nerve enhancement:
- Probiotic B.longum beneficial
- Deep breathing
- Mind body techniques
- Singing/humming
- Acupuncture
- Gargling vigorously
- Sing loudly
- Gag with a tongue depressor

Step 2: Replace - Pancreatic Enzymes

Ways to increase production of digestive enzymes (2):

- Swedish bitters— stimulate enzyme, bile, and HCl production
- Gentian root
- Wormwood
- Angelica root
- Orange peel
- Fennel
- Ginger
- Dandelion Root
- Vinegar

Step 2: Replace - Bile Salts & Acids

Role of bile:

- Important for digestion of fat
- Helps absorb fat soluble vitamins
- Helps remove toxins and waste (including cholesterol)
- Have anti-microbial effects

Step 2: Replace - Bile Salts & Acids

Signs of a bile deficiency:

- Vitamin deficiency (Vitamin A, D, E, K)
- Indigestion (due to fat maldigestion)
- Abnormal stools (greasy pale color stool)
- Poor liver function

Step 2: Replace - Bile Salts & Acids

Way to increase bile acid production:

- Cholagogues/Choleretics
- Agents that promote the production of bile by from liver and flow to gallbladder
- Bile salts (ox bile): 500–1000 mg with food
- Dandelion root (*Taraxacum officinale*)

Step 3 - Repair

How to repair the gut lining:

- Remove triggers - inflammatory foods and bacterial overgrowth - now completed
- Essential fats: 2-10 g/day
- Glutamine: 10-30 g/day (add food sources)
- Magnesium: 250-500 mg of magnesium chelate
- Vitamin A: 5000 IU retinol
- Zinc l-carnosine
- Butyrate

Step 3 - Repair

Gut support products with a combination of:

- L-glutamine (for repairing gut cells)
- Aloe vera, slippery elm, DGL, marshmallow root, (demulcent herbs that help repair gut lining)
- Antioxidants (to reduce inflammation)
- Example of a product on right

Supplement Facts			
Serving Size 8 grams (approx. one scoop)			
Servings Per Container 28			
Amount Per Serving	% Daily Value	Amount Per Serving	% Daily Value
Calories	20	Mucin	200 mg *
Cholesterol	less than 5 mg <2%	Marshmallow	100 mg *
Total Carbohydrate	4 g 1% ^{††}	(<i>Althea officinalis</i>)(root)	
Dietary Fiber	less than 1 g <4% ^{††}	Chamomile Extract	100 mg *
Total Sugars	1 g *	(<i>Matricaria chamomilla</i>)(flower)	
Zinc	17 mg 155%	Okra Extract	100 mg *
(from Zinc L-Carnosine 75 mg)		(<i>Abelmoschus esculentus</i>)(fruit)	
L-Glutamine	1.5 g *	Cat's Claw	100 mg *
N-Acetyl-D-Glucosamine	1 g *	(<i>Uncaria tomentosa</i>)(bark)	
Citrus Pectin	1 g *	Methylsulfonylmethane	100 mg *
Deglycyrrhized Licorice	400 mg *	(MSM)	
(DGL)(<i>Glycyrrhiza glabra</i>)(root)		Quercetin	100 mg *
Aloe Vera Extract	300 mg *	Prune Powder	100 mg *
(<i>Aloe barbadensis</i>)(leaf)			
Slippery Elm Extract	200 mg *		
(<i>Ulmus rubra</i>)(bark)			

Other Ingredients: Tapioca dextrin, natural flavors, certified organic stevia leaf extract (*Stevia rebaudiana*), citric acid, cellulose gum, silicon dioxide, decaffeinated black tea (*Camellia sinensis*)(leaf).

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Step 4 - Rebalance

Motility

- Transit of food through GI
- Chewing
- Swallowing
- Peristalsis
- Migrating motor complex

Step 4 - Rebalance

Intestinal motility disorders

- GERD
- IBS
- Fecal incontinence
- Chronic constipation

Step 4 - Rebalance

Vagus nerve:

- Largest nerve in the autonomic nervous system
- From brain through all organs in abdominal cavity
- Prominent role in gut, brain, and inflammation
- Regulates digestion, heart and RR, and reflex actions like sneezing, swallowing, coughing, and vomiting
- When activated it releases acetylcholine

Step 4 - Rebalance

Vagus nerve and digestion:

- Upregulates mechanical breakdown of solid foods
- Increases release of digestive enzymes
- Slows gastric emptying
- Coordinates motility
- Decreases inflammation and intestinal permeability
- Enhances satiety

Step 4 - Rebalance

Vagus nerve enhancement:

- Probiotic B.longum beneficial
- Deep breathing
- Mind body techniques
- Singing/humming
- Acupuncture
- Gargling vigorously
- Sing loudly
- Gag with a tongue depressor

Step 4 - Rebalance

Transit time modulators

- Ginger 1500-2000 mg/D
- Bitters
- Iberogast 20 drops TID
- Acupuncture 20-30 mins 3x/week
- D-limonene
- Probiotics
- Deep breathing/stress reduction

Conclusion

- When in doubt, treat the gut!