

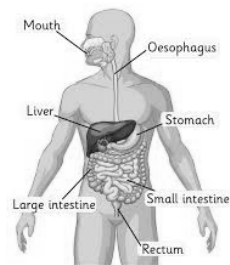
THE COMPLICATED INTERSECTION BETWEEN GASTROINTESTINAL HEALTH AND EATING DISORDERS

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OBJECTIVES

- Discuss normal digestion, and explore common digestive complaints of people with eating disorders
- Explain why IBS and other common functional disorders may be/are on the increase
- How to talk about digestive issues with people with eating disorders
- How to determine when and how to intervene to help reduce symptoms
- Discuss interventions that all team members can make to help reduce digestive discomfort

The digestive system



FUN FACTS ABOUT THE GUT

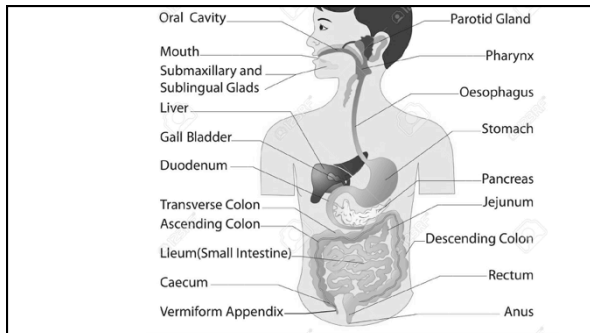
- Accounts for 2/3 of our immune system (including tonsils and appendix)
- Has its own separate nervous system that works together with the brain, but also has many independent functions
- Produces more than 20 unique hormones
- Salivary glands produce 1.5 – 2 pints of saliva daily
- Starting with the esophagus, most tissue is smooth muscle, which contracts without conscious sensation
- Due to many folds and villi, the surface area of our digestive system is about 100x greater than our skin surface area

FUN FACTS ABOUT THE GUT

- Digestion of food typically takes about 1 day from start to finish, from 2-6 hours in the stomach, a few hours traversing the small intestine, and up to 16 hours in the large intestine
- We are learning more information all the time. The microbiome has also been studied since 2008, when NIH created The Human Microbiome Project
- In 2007, it was discovered that probable function of the appendix is to keep a storehouse of gut bacteria for use if something major happens and the microbiome needs to repopulate .

OVERVIEW OF NORMAL DIGESTION

- Mouth
- Esophagus
- Stomach
- Small intestine is responsible for breaking down food into smaller components and allowing for most nutrients to be absorbed
- Large intestine allows for further, more complete digestion (this can lead to gas production by bacteria), absorption of water, and a few other micronutrients like calcium, Vitamin K, B12 and other B vitamins



ALTERED DIGESTION THAT CAN OCCUR IN EATING DISORDERS

- Mouth/esophagus
- Stomach
- Slowed motility
- Small intestine
- Large intestine
 - If laxatives are being used, can interfere with absorption of calcium, B vitamins, water
 - With constipation, this can back up the system and contribute to nausea, reflux or heartburn, and lack of appetite

ALTERED DIGESTION IN EATING DISORDERS

- Altered eating behavior is strongly associated with altered gut sensitivity and GI motility
- Fill in details...

THE GUT HAS ITS OWN NERVOUS SYSTEM

- In the same way that we don't feel most of our organs functioning, this happens in the gut also. Somewhere past the throat, we stop feeling the ingestion of food as smooth muscle takes over. This muscle tissue moves in waves, and isn't under our conscious control.
- The enteric nervous system of the gut operates autonomously from the brain; if connection is severed, the digestive system continues to function.
- In many individuals, stress causes smooth muscle to contract around blood vessels, which reduces the blood supply.

THE ENTERIC NERVOUS SYSTEM

- In many parts of the gut, ENS coordinates function with the brain, and difficult functions are performed in step with both. Examples of what happens when this coordination starts to be less in sync: difficulty swallowing without choking, GERD/ heartburn, unintentional passing of gas or worse.

HOW DOES STRESS AFFECT DIGESTIVE PROCESS?

- Some individuals tense abdominal muscles when stressed, which can lead to difficulty with moving bowels (ie constipation)
- Small intestine works most effectively to break down and absorb nutrients when it is relaxed. If bloodstream is full of stress hormones, this can slow digestion and increase physical discomfort.
- Emotions like fear or anxiety can reduce the ability of smooth muscle to stretch. If the stomach doesn't stretch adequately, fullness happens rapidly which can quickly lead to nausea.!!!

WHAT ARE FGIDS?

- Functional Gastrointestinal Disorders are when anatomy appears normal and there is no physical sign of GI disease, but person is experiencing uncomfortable symptoms that affect quality of life.
- We've all seen many patients who fit this picture, often ending up with diagnosis of IBS or other diagnosis, but not given recommendations to help relieve symptoms

DIGESTIVE HEALTH IN VARIOUS COUNTRIES

- Incidence of IBS appears to be greater in westernized countries
 - More processed, lower fiber diet
 - Stress
 - Use of sitting-position on modern toilets vs age-old squatting position ("squatty potty")

Hemorrhoids, diverticulitis and constipation are much more common in countries that sit on chair-type toilet. These conditions are much more rare in countries that continue to use squatting position.

COMMON DIAGNOSIS OF GI DISORDERS IN EATING DISORDER PATIENTS

- 98% of 101 patients admitted to Australian Eating Disorder clinic fit criteria for functional GI disorders, and 50% specifically met criteria for IBS.*
- IBS in eating disorder patients is strongly correlated with anxiety and OC characteristics
- Besides IBS, other common FGIDs include heartburn, bloating, constipation, dysphagia and anorectal pain*
- Pelvic floor dysfunction may be a contributor to distention/bloating in patients with eating disorders **

ROME IV CRITERIA FOR FGIDS

- "Functional GI Disorders are disorders of gut-brain interaction. It is a group of disorders classified by GI symptoms to any combination of the following: motility disturbance, visceral hypersensitivity, altered mucosal and immune function, altered gut microbiota, and altered central nervous system processing."
- Emphasizes that the best management for FGIDs requires a biopsychosocial approach, and considers:

CONSTIPATION

- Very common in people with eating disorders (chronic constipation or alternating with diarrhea)
- Between 10-20% of people in the US deal with constipation.
- Criteria for Chronic Constipation:
 - Bowel movements less than 3x per week
 - Hard stool, often in pellet form much of the time
 - Difficulty fully emptying bowels, or feeling of incomplete evacuation

CELIAC DISEASE

- A serious auto-immune disorder where the gluten molecule can cause damage to the intestinal walls and to the nervous system. The only treatment is to avoid gluten 100%, and this is not optional. If a gluten-free diet isn't followed, risk for later developing other auto-immune disease and some types of cancer is increased.
- Diagnosis definitive with biopsy of the small intestine (but patient must be eating gluten for damage to be observed). A blood test is often used for initial screening, and if positive, then a biopsy is recommended.

CELIAC DISEASE

- Common Symptoms
 - Abdominal pain and bloating, gas
 - Constipation or diarrhea
 - Weight loss
 - Fatigue
 - Short stature, TTT in children
 - Irritability
 - Unexplained anemia
 - Bone or joint pain
 - Depression or anxiety
 - Missed periods
 - Itchy skin rash

CELIAC DISEASE

- There are more than 200 known symptoms, many of which are not common, or are hard to connect to Celiac Disease, such as:
 - Chronic migraine
 - Peripheral neuropathy
 - Vitamin deficiency (folic acid, B12)
 - Brain fog
 - Seizure
 - Lack of muscle coordination

FOOD ALLERGIES AND INTOLERANCES

- Gluten Intolerance – biopsy shows no damage, but patients experience increased digestive symptoms (gas, bloating, sometimes other symptoms like headaches. Symptoms improve on gluten-free diet.
- Questions remain...is it the gluten, or is it undigestible carbohydrates (FODMAPS), or is it natural pesticides found in the wheat, or...?
- With intolerances, many people can consume some quantity without significant effect, and individual tolerance can vary. ie. Lactose intolerance

FOOD INTOLERANCES

- 40% of the population likely has fructose intolerance at some level. How many people have had digestive regret at overdoing it during cherry season?
- Our food supply has shifted into higher amounts of fructose as sweeteners, in the forms of fruit sugar and HFCS and just overall increase in use of sweeteners in packaged foods.
- Fructose intolerance can affect mood over time. In the digestive process, tryptophan latches on to sugar molecules for better absorption. However, excess sugar may be dumped instead of absorbed, taking tryptophan with it. Since tryptophan is a precursor of serotonin, the resulting decreased neurotransmitter levels can lead to lower mood.

COMMON MEDICATIONS AND THEIR RELEVANT GI/NUTRITIONAL SIDE EFFECTS

- Anti-depressants:
 - Diarrhea: most common with sertraline (16% of patients) but still relatively common with Bupropion, fluoxetine, mirtazapine, paroxetine, and venlafaxine (8% of patients)
 - Constipation: more common with SNRI's such as Venlafaxine
 - Nausea and vomiting: ~33% of patients prescribed Venlafaxine(!), 22% of SSRI's as a class
- Anti-Psychotics
 - Weight gain: common at typically prescribed doses of anti-psychotics, less so on lower doses which have been used specifically for eating disorder treatment
 - Anticholinergic effects: dry mouth, constipation

RED FLAGS FOR SERIOUS GI CONDITIONS

- New onset of symptoms >50 yo.
- Blood in the stool
- Nocturnal or progressive abdominal pain
- Weight loss*
- Lab abnormalities such as anemia*, electrolyte abnormalities*, or inflammatory markers.
 - *Symptoms obviously must be put in the context of patient's current eating disorder status
- Major change in GI symptoms or progression of symptoms after refeeding and general treatment management of "functional" symptoms

American College of Gastroenterology Task Force on IBS, Brandt LJ, Chey WD, et al. An evidence-based position statement on the management of irritable bowel syndrome. *Am J Gastroenterol* 2008; 104 Suppl 1:S1.

SIBO- MIGRATING MOTOR COMPLEX

- The Migrating Motor Complex (MMC) is a term used to describe a 3 phase process of gastric motility during a fasting state.
- Impairment of the MMC is thought to be one of the culprits in both the etiology AND maintenance of SIBO and functional GI Disorders. Symptoms of MMC impairment and SIBO may include: functional dyspepsia, nausea, easy satiety and prolonged fullness, abdominal discomfort.
- Conditions that impair the MMC include:
 - Stress/Vagal Nerve Impairment – this is particularly common among Binge Eating Disorder and Bulimia Nervosa
 - Frequent and large meals:
 - Motilin is one of the peptides required for initiation of the MMC. Motilin plasma levels increase cyclically every 90–120 minutes during the interdigestive fasting period, and this cyclical release of motilin disappears after ingestion of a meal. Thus, it is generally recommended that patients have at least 3 hours in between meals.
 - Tricky territory in our population!
 - Achlorhydria

BASICS OF THE MICROBIOME

- We each have our own unique set of bacteria, viruses, fungi and some other micro-organisms on our skin, in every crevice and on every part of the body, including eyelids.
- The microbiome is affected by our environment, people we live with, pets, dirt, food, plants, air, etc.
- The human body has 10 bacteria cells for each human cell. Total individual's microbiome weighs about 3 lbs.

BASICS OF THE MICROBIOME

- Babies are sterile until birth. They pick up bacteria in the birth canal and are gradually colonized by mother's microbiota. Breastmilk contains bacteria from mother's digestive tract ("the perfect probiotic), which helps establish infant's immune system.
- So what happens with cesarean births? First exposure is to bacteria on mother's skin, which is very different from the gut. If breastfed, will get inoculated that way. If fed sterile formula, what are the long-term impacts?
- By age 2, the microbiome is pretty well established, and it becomes harder to change.

BASICS OF MICROBIOME

- Micro-organisms, many "friendly" to our health, help train immune system, control pathogens, digest food, and extract nutrients.
- Whether particular micro-org are beneficial can depend on where they are located. Certain bacteria may be great in the large intestine, but can wreak havoc in the small intestine.

FUN FACTS ABOUT THE MICROBIOME

- Over 1000 genes in the liver help regulate our circadian rhythm. These are controlled by gut microbes
- Gut microbes are affected by diet. Traditional western diet (high in fat and carbs, low in fiber and whole grains) creates an imbalance that changes the metabolic setpoint.

MICROBIOME AND RESEARCH

- Scientists are studying how the microbiome may be related to many different disease states and conditions, including food allergies, asthma, Type 1 Diabetes, autoimmune disorders, autism, inflammatory bowel disease, and brain disorders like Alzheimer's. Still very early in research stages, so it's important not to jump too quickly into conclusions. But scientists have been able to "cure" autism in mouse model.
- As the ability to identify different micro-organisms has developed, and disease states that haven't been helped much with traditional western medicine interest in gut health is leading into potentially vital areas.

THE MICROBIOME AND EATING DISORDERS

- In one small study, patients admitted to inpatient treatment for Anorexia Nervosa showed significant alterations in both population size and diversity of microbiota compared to healthy controls. Upon weight restoration at discharge, gut diversity improved though was still significantly less than controls.
- Similarly, bacterial imbalance in patients with Anorexia Nervosa is associated with psychological symptoms related to AN including stress and anxiety. In addition, limitations in nutritional intake reinforce altered microbiome composition, further weight loss, anxiety, and depression. Conversely, positive changes in mood found with increased gut diversity.

SEROTONIN, THE MICROBIOME, AND FUNCTIONAL GI DISORDERS - LAY OF THE LAND

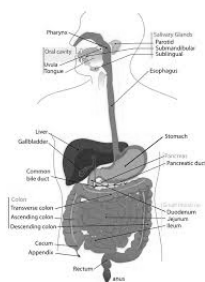
- The Microbiome is the community of microorganisms (bacteria) in our bodies.
- Serotonin is a neurotransmitter that play a major role in both the gut and brain signaling pathways
- Serotonin and the microbiome have a bidirectional relationship within the gut-brain axis
- Visceral hypersensitivity is one of the key mechanisms in pain perception in functional GI disorders
 - Enterochromaffin cells in the gut send information between the GI Tract and the nervous system. These cells are innervated by ascending (ie: towards the brain) vagal sensory fibers and are influenced by the microbiome.
 - On the other end of that pathway, serotonergic pathways play a large role in pain modulation in descending (ie: towards the viscera) pain pathways.
- Serotonin also responsible for regulation of mood, cognition, sleep, and appetite just to name a few!
- During a starvation state, the GI tract loses the ability to produce healthy serotonin levels. Similarly, malnutrition may contribute to altered composition of the microbiome and increase risk to intestinal inflammation and permeability.

SEROTONIN, THE MICROBIOME, AND FUNCTIONAL GI DISORDERS – THE FUTURE!

- Exciting research is on the horizon! There is currently a large study out of UNC to examine the bidirectional nature of the microbiome in the etiology of eating disorders as well as the impact of eating disorders on the microbiome.
- Small studies emerging utilizing probiotics in the treatment of Functional GI Disorders, Mood Disorders, and Eating Disorders.
- Types of probiotics and the neurotransmitters they build:
 - *Bacillus* – Dopamine, Norepinephrine
 - *Bifidobacterium* – GABA
 - *Enterococcus* – Serotonin
 - *Escherichia* – Norepinephrine and Serotonin
 - *Lactobacillus* – Acetylcholine and GABA
 - *Streptococcus* – Serotonin

RE-EVALUATING TRADITIONAL APPROACHES

- Looking at GI surgery from the bacteria's point of view:
 - Often antibiotics are given before and/or after GI surgery, depending on the purpose of the surgery (diverticulitis or Crohn's disease, for example). This wipes out vast majority of bacteria.
 - Then normally anaerobic environment is exposed to oxygen, adding a second toxic assault on bacteria.
 - After surgery, the micro-biome tries to repopulate from remaining few bacteria that survived. They can end up fighting against the healing process by competing with human cells for nutrients.
- Research from surgery is partly dependent on how Microbiome reacts.



FOOD ALLERGIES

- FAs have risen dramatically over the past two decades
- Cesarean delivery is a major factor associated with allergies. And possibly use of formula.
- Researchers have identified a certain type of gut bacteria (Clostridia) that may protect the body against allergies.

FOOD INTOLERANCES

- Gluten intolerance – discuss that it's still being researched. Is it actually gluten or could it be related to natural pesticides in wheat
- Fructose intolerance
- Lactose intolerance
- Food additives and "fake foods" like artificial sweeteners
- Any of the above can lead to increased gas, bloating, GI discomfort, even diarrhea or constipation, so how do we manage and work with our patients around these issues??

MANAGING GI ISSUES IN ED CLIENTS

- Take a thorough history (medical providers, RDs especially)
- Evaluate current symptoms. If potentially dangerous, refer to GI for further assessment. If not, refer to RD for how to approach.
- Determine if there are small changes that may help (reduce gum chewing, diet soda, caffeine)
- Help clients learn to relax before, during and after eating. Explain that the body has to be paying attention to start producing digestive hormones, and that muscles need to be relaxed in order to allow digestion to occur.

FODMAPS

- <http://www.med.monash.edu/cecs/gastro/fodmap/>
- Discuss evidence for FODMAPS
- Lack of evidence for SCD, other extremely restrictive diets

FODMAPS DIET

- Should be discussed with dietitian/healthcare provider who has experience in eating disorders and digestive issues
- Should be approached very thoughtfully, considering risks and benefits
- Low FODMAPS diet is not intended for long-term use, only for help in identifying particular problem foods.
- Anyone following a low FODMAPS diet for more than 2 months can start to risk nutritional deficiencies.

FODMAPS

FODMAPS

USE CAUTION IN DISCUSSING GUT ISSUES

- Putting too much emphasis on GI issues can increase anxiety/stress, leading to more gut symptoms, which can increase anxiety/stress,...
- Take care with scope of practice. Refer pts to medical provider or dietitian around most of these issues.
- Be aware of the high degree of popular literature related to gut health, food intolerances and diet; best sellers are often taking a small nugget of truth or pseudoscience and running with it.

HOW WE CAN ALL HELP OUR CLIENTS

- Low Hanging Fruit
 - Ask about gum chewing. Sugar alcohols in sugar-free gum cause digestive discomfort in many people, especially if high volume.
 - Ask about eating routines...do they sit down to eat, is it relaxed, are they anxious and not breathing while eating, etc. Help clients find individual relaxing rituals to pair with eating.
 - Ask about caffeine intake (diet soda, coffee drinks, energy drinks). In addition to suppressing appetite, caffeine increases anxiety. Anxiety can increase IBS symptoms. And caffeine itself is a gastric irritant.
 - Don't automatically agree that specific foods are the problem.

HOW WE CAN ALL HELP OUR CLIENTS

- Explain to clients how anxiety and negative emotions around meals can negatively impact the physical act of digestion. Then work with the client to find types of mindfulness and relaxation that work for that individual.
- Be aware that diagnoses requiring strict diets for more than 6-8 weeks are uncommon, and often lead to more harm than benefit.
- Some alternative care providers or MDs recommend overly restrictive diets for extended periods when there is often a better solution. Be watchful and work with patients and other providers to try to find a better approach.
- As we all know, over restriction can lead to disordered eating and eating disorders, or to relapse in clients who have eating disorder hx. Many providers do not have this awareness.

FOR DIETITIANS

- Take a thorough GI and eating disorder history. Try to determine which started first. Family GI history can be helpful.
- Keep in mind there is high variability in awareness and sensitivity of GI issues. IBS is associated with visceral hypersensitivity; patients often experience stronger sensations of GI pain and discomfort.
- Talk to patients about the rationale for first treating the eating disorder symptoms and waiting to see what GI symptoms remain. Many GI symptoms abate after 4-6 weeks of refeeding.

FOR DIETITIANS

- If GI symptoms persist after refeeding, consider whether GI consult is needed and refer (for Celiac Disease testing or to rule out IBD or get clearer diagnosis).
- If IBS diagnosis and eating disorder behaviors are substantially reduced, consider having client do food journal and symptom diary. Then look for individual suspect foods.
- If there are already suspect foods, can consider trial of eliminating specific food for a short period to see if symptoms decrease. Be very careful about removing entire food groups (dairy or grains, for example).

COMMON MEDICATIONS AND THEIR RELEVANT GI/NUTRITIONAL SIDE EFFECTS

- Many patients will be placed on the following medications during the course of treatment. Anytime you hear of a NEW symptom following initiation of medication have a high level of suspicion for medication side effect.
- Proton Pump Inhibitors (Omeprazole/Prilosec, Lansoprazole/Prevacid)
 - Used to manage heartburn/GERD/ulcers
 - More concerning after prolonged use (>1 year)
- Side effects:
 - Increased risk of C. difficile and other enteric infections
 - Nutrient malabsorption including Iron, B12, Calcium, and Magnesium.
 - Atrophic Gastritis
- Oral Contraceptive Pills –evidence inconclusive, but important to be aware of in this population
 - *May* contribute to predisposition towards or worsening inflammatory bowel disease. The literature is conflicting.
 - Nutrient depletion: Zinc, Magnesium, Selenium, Vitamins C, E, Folic Acid, B6, B12, B3

RESOURCES

- Gut: The Inside Story of Our Body's Most Underrated Organ by Giulia Enders

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