

THE COMPLICATED INTERSECTION BETWEEN GASTROINTESTINAL HEALTH AND EATING DISORDERS

Valerie Edwards, MS, RD, LD

February 25, 2017

OBJECTIVES

- Discuss normal digestion, and explore common digestive alterations and complaints of people with eating disorders
- Explain why IBS and other common functional disorders may be/are on the increase
- Explore 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 use to help clients reduce uncomfortable digestive symptoms

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 gut 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

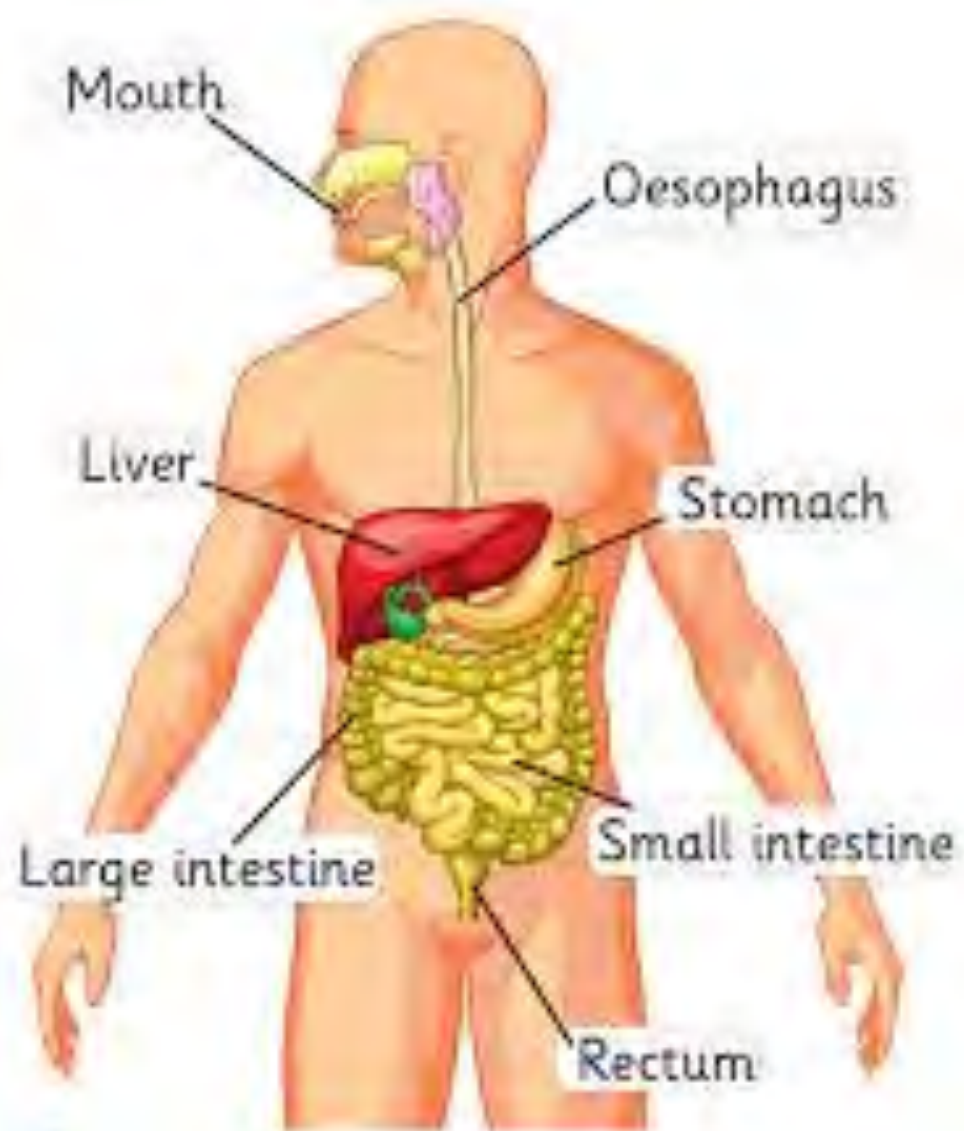
FUN FACTS ABOUT THE GUT

- Digestion of food typically takes about 1 day from start to finish, including 2-6 hours in the stomach, a few hours traversing the small intestine, and up to 16 hours in the large intestine. Varies greatly between individuals, however.
- We are learning new information all the time. The microbiome has only 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 .
- While study of the gut-brain axis is relatively new, evidence is building that supports a strong relationship between digestive health and mental health, as well as physical health.

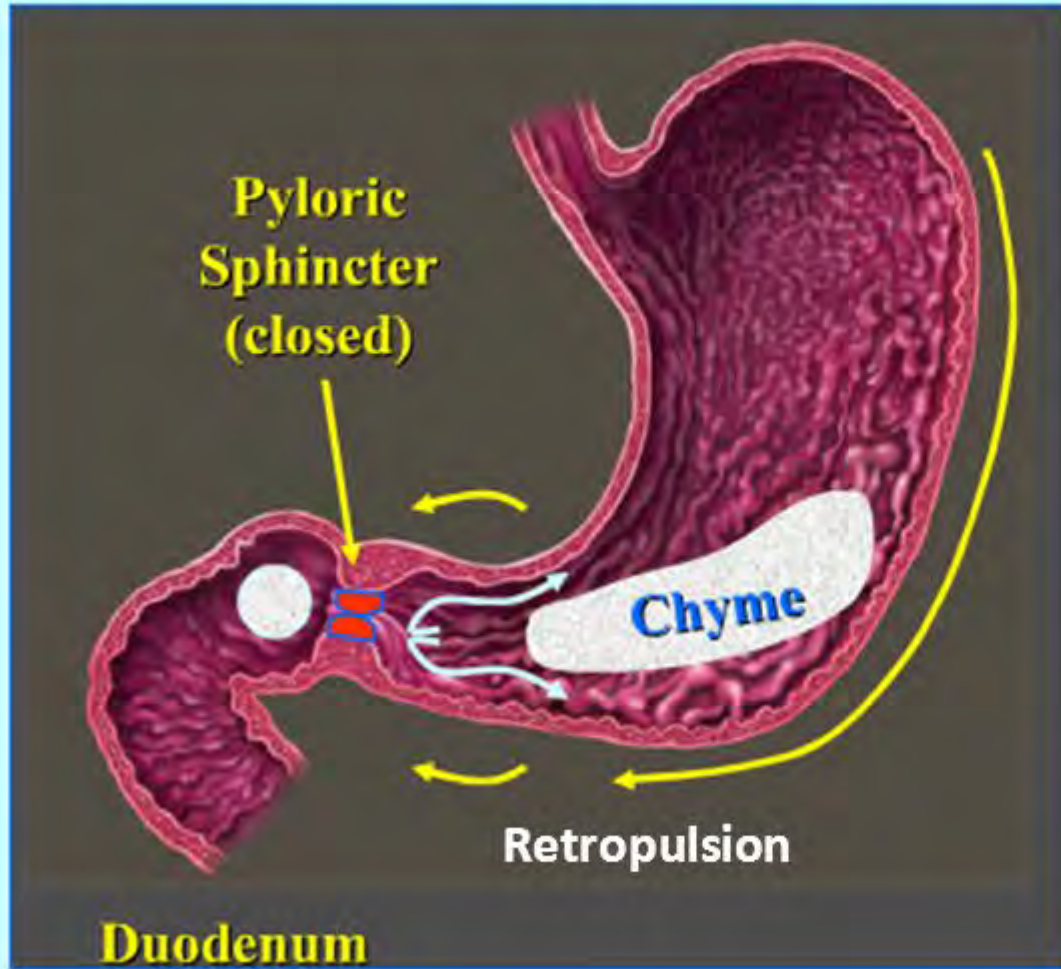
OVERVIEW OF NORMAL DIGESTION

- Mouth – chewing, saliva released, swallowing
- Esophagus – swallowing, entry to stomach via pyloric sphincter
- Stomach – food turns into chyme with addition of enzymes and fluids
- 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

The digestive system



Mechanical Processes: Mixing and Emptying



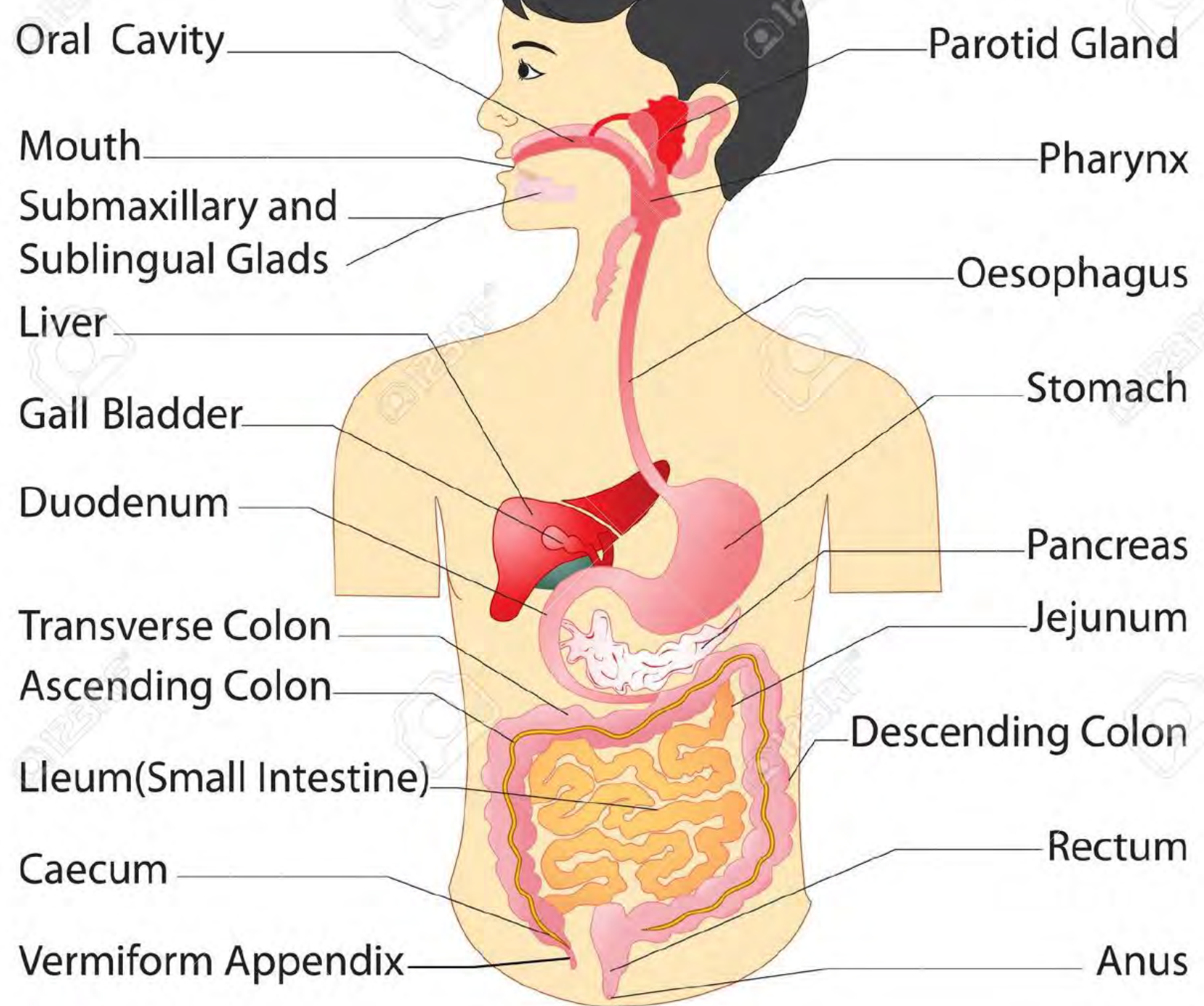
4. When the peristaltic wave reaches the pyloric sphincter it closes.

5. The remainder of the chyme is propelled backwards.

6. The next wave of peristalsis pushes the chyme forward again.

“REST AND DIGEST”

- **Parasympathetic state occurs when we are relaxed, which allows for normal digestion.**
- Heart rate and breathing slows down, and our body isn't in “fight or flight” mode. Blood is allowed to shift to digestive process.
- The parasympathetic function is what promotes salivation, stomach acid production, pancreas secretion of enzymes, gallbladder ejection of bile, and regular motor function to move food through the small intestine and colon.
- When anxiety or chronic physical stress is associated with food/mealtimes, a lot of things start functioning less than optimally.





ALTERED DIGESTION THAT CAN OCCUR IN EATING DISORDERS

- Mouth and Esophagus
 - If teeth are damaged from purging, can impact chewing and what foods are tolerated. Heartburn and GERD common.
- Stomach
 - Stomach pain, gas and bloating are common symptoms of IBS. Occurs in stomach and small intestine as slowed activity results in food taking longer to digest.
- Slowed motility
 - Restricting and Purging can also contribute to gastroparesis and slowed motility, increase GERD/heartburn, and generally confuse the nerves and muscles of the digestive system



"Just as I suspected... you don't
chew your food enough."

ALTERED DIGESTION THAT CAN OCCUR IN EATING DISORDERS

- Small Intestine
 - Lack of use (due to restricting and/or purging) results in slowing and possible dysregulation of the muscles of the small intestine to push foods down the line. This increases gas, bloating, constipation.
- 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. Can also lead to hemorrhoids and diverticulitis.
 - Inadequate food and fluid results in lack of material needed to push through the intestines, exacerbating experience or perception of constipation

The Act Of Vomiting

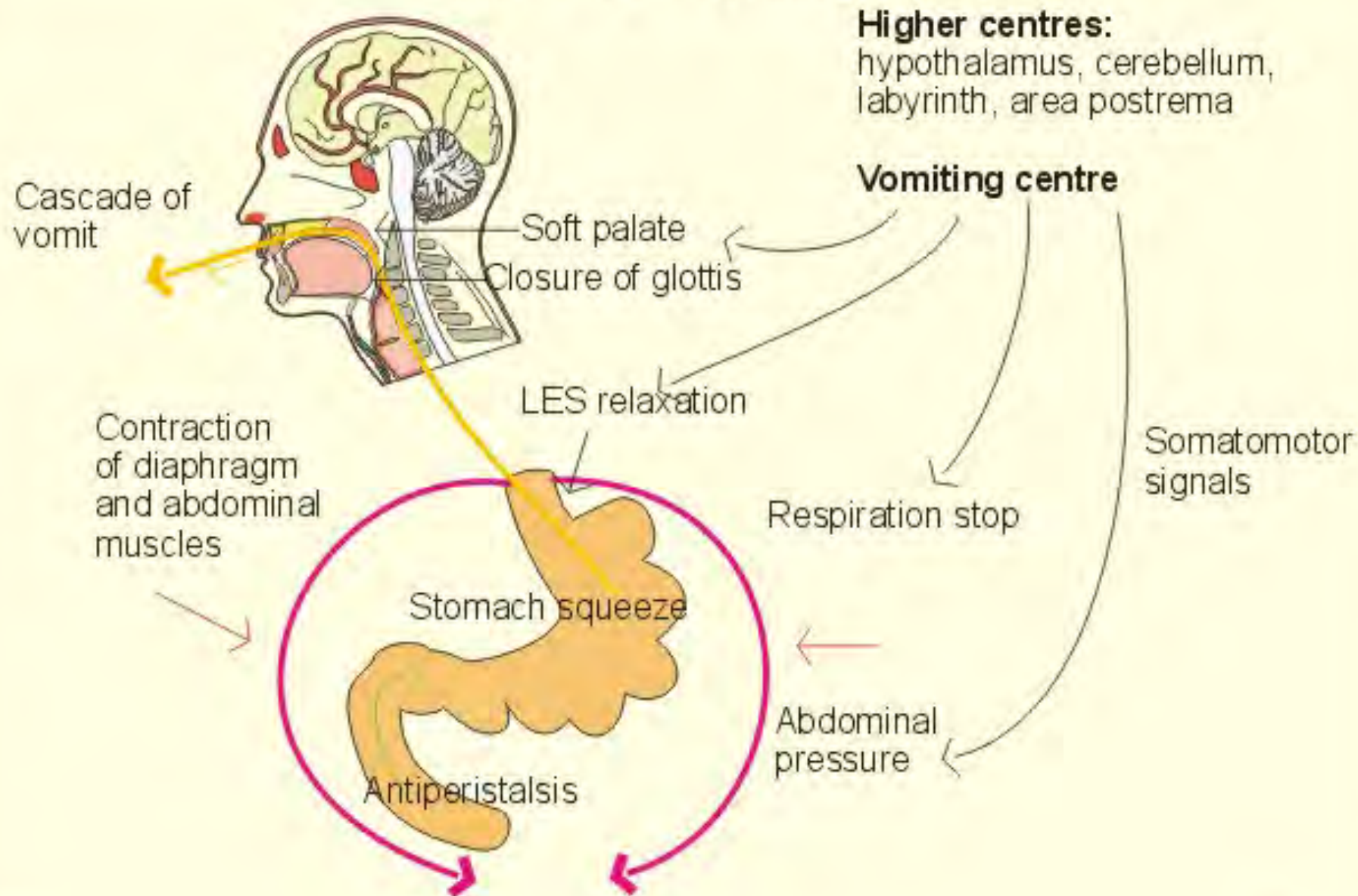


Fig. 22-4

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.

THE ENTERIC NERVOUS SYSTEM

- In the same way that we don't feel most of our organs functioning, we can usually forget about digestion as it continues on its own. 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 (gut-brain axis), 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

HEALTHY GUT

Healthy
central nervous
system function



Normal gut
microbiota



Physiological levels of
inflammatory cells/mediators

Normal gut microbiota

STRESSED GUT

Alterations in
behavior, cognition,
and emotion



Alterations in
behavior, cognition,
and emotion



Increased levels of
inflammatory cells/mediators

Intestinal dysbiosis

A stable and healthy gut is essential to overall health. Intestinal dysbiosis, or an imbalance, can negatively influence the gut and the brain.

MIGRATING MOTOR COMPLEX

- MMC is the “housekeeper” of the digestive system. Slow peristalsis waves that sweep through the entire digestive tract
- During fasting state, it occurs every 60-90” to clear out undigested residue and move it along
- Thought to take 3-4 hours between meals/snacks to allow for emptying of stomach to occur, and then trigger the MMC to do its work
- Process may be slowed in people with eating disorders and/or gastroparesis



**NOW THAT WE HAVE BACKGROUND ON
PHYSIOLOGY AND HOW MECHANICS OF
DIGESTION CAN BE IMPACTED BY EATING
DISORDERS, LET'S LOOK AT SOME COMMON
GI DIAGNOSES**

RED FLAGS FOR SERIOUS GI CONDITIONS

Family history of Colon Cancer or Inflammatory Bowel Disease

- New onset of symptoms >50 yo.
- Blood in the stool
- Nocturnal or progressive abdominal pain
- Unexplained Weight loss
- Lab abnormalities such as anemia, electrolyte abnormalities, or inflammatory markers without other explanation
- 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 2009; 104 Suppl 1:S1.

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, FTT in children
 - Irritability
 - Unexplained anemia
 - Bone or joint pain
 - Depression or anxiety
 - Other autoimmune diseases, including Type I Diabetes
 - 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)
 - Unexplained Infertility
 - Seizure
 - Lack of muscle coordination

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
- <https://www.iffgd.org/functional-gi-disorders.html>

ROME IV CRITERIA FOR FGIDS

- “Functional GI Disorders are disorders of gut-brain interaction, classified by GI symptoms to any combination of the following:
 - motility disturbance
 - visceral hypersensitivity
 - altered mucosal and immune function
 - altered gut microbiota
 - altered central nervous system processing

ROME IV CRITERIA FOR FGIDS

- Emphasizes that the best management for FGIDs requires a biopsychosocial approach, and considers:
 - Medications
 - Stress management
 - Psychotherapy
 - Hypnotherapy
 - Lifestyle

DIGESTIVE HEALTH IN VARIOUS COUNTRIES

- Incidence of IBS appears to be greater in westernized countries (10-15% in US)
 - More processed, lower fiber diet
 - Stress
 - Use of sitting-position on modern toilets vs age-old squatting position (“squatty potty”)

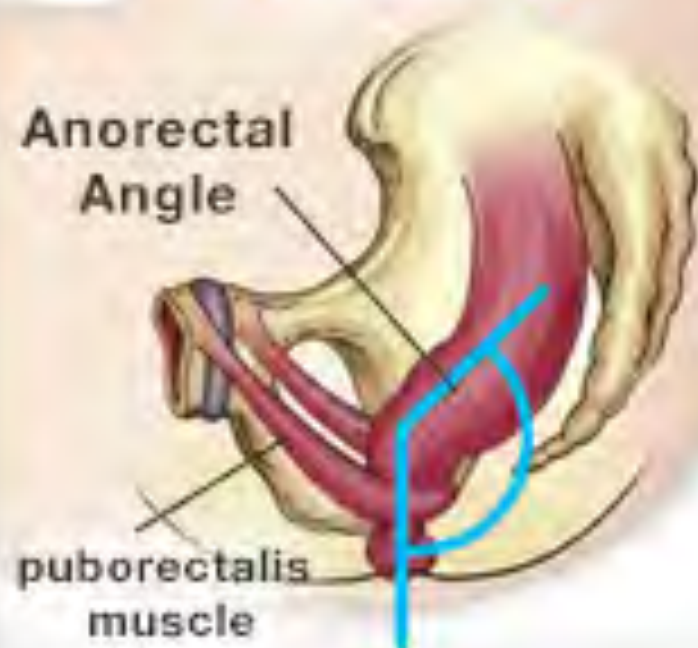
Hemorrhoids, diverticulitis and constipation are much more common in countries that sit on chair-type toilet. These conditions are much more rare in countries that continue to use squatting position.

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

PROBLEM

Sitting



THE PUBORECTALIS MUSCLE
"CHOKES" THE RECTUM
MAINTAINING CONTINENCE

SOLUTION

Squatty Potty



SQUATTING RELAXES THE
PUBORECTALIS MUSCLE ALLOWING
EASIER ELIMINATION

GI DISORDERS COMMON 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 **

FOOD 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

- 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??

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.

SIBO

- Small Intestinal Bacterial Overgrowth – when bacteria that normally proliferate in the large intestine migrate into the small intestine and cause problems
- Theorized to be a significant cause of IBS
- Symptoms
 - Bloating and gas
 - Belching, dyspepsia, heartburn
 - Abdominal pain, discomfort, cramps
 - Constipation and/or diarrhea
 - Nausea
 - Malabsorption, including anemia
 - May also cause systemic symptoms, including headache, joint or muscle pain, fatigue

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. 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: obviously tricky with ED population
 - Achlorhydria

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

BASICS OF THE MICROBIOME

- We each have our own unique set of bacteria, viruses, fungi and some other micro-organisms in and on every part of the body.
- 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 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 2-3, 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 (SIBO)

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.

FOOD ALLERGIES AND THE MICROBIOME

- 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.

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 FGIDS

- 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
- Serotonin also responsible for regulation of mood, cognition, sleep, and appetite and more!
- 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 of 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
- Bifidobacterim – GABA
- Enterococcus – **Serotonin**
- Escherichia – Norepinephrine and **Serotonin**
- Lactobacillus – Acetylcholine and GABA
- Streptococcus - **Serotonin**

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/>
- Currently, most evidence-based approach for IBS is low FODMAPS diet
- Lack of evidence for SCD, other extremely restrictive diets

FODMAPS

- FODMAPs are small chain sugars and fibers that are poorly digested and can contribute to gas, bloating and other digestive discomfort. FODMAPs are fast food for gut bacteria, which produce gas and can cause bloating in the process of breaking down these foods.
- FODMAPS diet should only be taken on while working with a trained registered dietitian.
- <http://www.katescarlata.com/fodmaps/>
- <http://www.ibsfree.net/about-patsy-catsos/>

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.

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.

USE CAUTION IN DISCUSSING GUT ISSUES

- Elimination diets are risky and can be a risk for starting an eating disorder.
- Often seen recommended by alternative health care providers for SIBO or other GI disorders.
- Encourage dialog on treatment team on how to approach with more gradual approaches, and to be careful to not trigger negative language around diet and food choices.

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.
 - Excessive quantities of fruits and vegetables can exacerbate GI symptoms.

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, B2

BIBLIOGRAPHY

- *Gut: The Inside Story of Our Body's Most Underrated Organ*, Giulia Enders
- *Eating Disorders and GI Symptoms - Understand the Link between them and how to Treat Patients*, Kate Scarlata, Today's Dietitian: Oct 2014.
- *Can Eating Disorders cause Functional Gastrointestinal Disorders?*, Janssen, P., Neurogastroenterol Motil, (2010) 22; 1267.
- *Do the digestive tract symptoms in eating disorder patients represent Functional gastrointestinal disorders?* Abraham and Kellow. BMC Gastroent 2013, 13:38.
- *Appearance and disappearance of functional Gastrointestinal Disorders in patients with Eating Disorders*, Boyd, Abraham and Kellow. Neurogastroenterol Motil (2010)22, 1279.
- *How to Test and Treat SIBO: an Evidence-Based Approach*, Rezlei, Pimental and Rao. Neurogastroent and Mot (2016) 18:8.

BIBLIOGRAPHY

- *A Diet Low in FODMAPS Reduces Symptoms of IBS*, Halmos, Power et al. Gastroenterology Jan 2014 146(1): 67
- *Controversies and Recent Developments of the Low-FODMAP Diet*, Hill, Muir and Gibson. Gastroent & Hepatology, Jan 2017, Vol 13: 1.

ACKNOWLEDGMENTS

- Sara Hopkins, ND
- GI Dietitian Group – Jamie Lee, RD, Elke Schleiss, RD, and Niki Streal, RD
- The many patients with eating disorders and digestive issues that have shared their experiences.