

DIGEST



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Our mission is to advance the biopsychosocial understanding and care of patients with functional GI & motility disorders through research, training and education.

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Loose, watery stools or diarrhea makes the anal sphincter's job of holding back a bowel movement more difficult and can result in episodes of fecal incontinence. Risk factors for fecal incontinence include increased age, stool consistency, pelvic floor dysfunction, and comorbid diagnosis. [2] Constant fear of accidents and running to the toilet at the inkling of a groaning bowel is frustrating and exhausting. Diarrhea associated fecal incontinence (FI) affects a patient's quality of life and overall health. Not only is it embarrassing when it happens, but in the geriatric population, it associated with an increased risk for referral to a nursing home.[11]

Similar to when you're holding water in a balloon, if you don't have a tight enough grasp, the water can slip out. The same is true with the anal sphincter, regardless of gender. If the stool is too loose, it has a greater risk of leaking.

A gastroenterologist typically orders screening pathology to identify serious causes for diarrhea, such as harmful pathogens, parasites, ulcerative colitis, Crohn's Disease, microscopic colitis, or

colon cancer. Endoanal ultrasounds are also a good diagnostic test to utilize, as they will tell is there are any defects in the anal sphincter that may prevent the ability to stay continent. If the pathology is negative, utilizing diet and medications to manage stool consistency, specifically loose and watery stool, are the first steps when managing diarrhea associated fecal incontinence.

DIET

What we eat plays a large role in the consistency of our stool. Certain foods can trigger or exacerbate diarrhea or uncomfortable bowel symptoms. Examples of types of foods that can loosen stools are fried or high fat foods, high FODMAP (fermentable oligosaccharides, disaccharides, monosaccharides, and polyols), and artificial sweeteners have been associated with loose bowel movements or diarrhea.[4-7]

It is important to add that eating a low FODMAP diet shouldn't be exclusionary for long periods of time, as this could lead to a nutrient deficiency. High FODMAP foods can be eliminated in the beginning

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DIGEST is a quarterly publication of the UNC Center for Functional GI & Motility Disorders, a center of excellence within the Division of Gastroenterology and Hepatology, School of Medicine, University of North Carolina at Chapel Hill.

Over the past decade, the UNC Center for Functional GI and Motility Disorders has enjoyed significant grant support from a number of private foundations and corporations. These grants have ranged from sponsorships of specific events (symposia or CME courses) to unrestricted grants in support of fellowships and the Center's education and training effort.

The Center's director is **William E. Whitehead, PhD**, Professor of Medicine and Gynecology.

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DIGEST

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Printed on 30% post-consumer recycled paper

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PUBLICATION EXPLANATION

This section of the Digest is devoted to highlighting an explaining functional gastrointestinal research publications that have been released in the past 18 months. As stated in our mission statement, we are dedicated to the understanding and treatment of patients with functional GI and motility disorders. These are summaries of key findings from the following published research articles.

DISTURBED SLEEP IMPACTS PATIENTS WITH IRRITABLE BOWEL SYNDROME

Patel A, Hasak S, Cassell B, Ciorba MA, Vivio EE, Kumar M, Gyawali CP, Sayuk GS. Effects of disturbed sleep on gastrointestinal and somatic pain symptoms in irritable bowel syndrome. *Aliment Pharmacol Ther.* 2016 Aug;44(3):246-58.

Sleep length, sleep quality, sleep disturbances all play a role in GI and non-GI symptoms.

Baseline information from this particular study was collected on IBS and healthy controls. IBS patients had an increased use of sleep aids, lower quality of life (QOL), higher tobacco use, higher tricyclic anti-depressant use and other anti-depressant use, and lower full- or part time employment, compared to the healthy population.

Researchers found that patients with irritable bowel syndrome (IBS) reported a higher incidence of sleep disturbances and waking up throughout the night, compared to the healthy population, but the reasons for disturbed sleep were more related to non-GI symptoms such as back pain, headaches, and waking up to urinate.

IBS patients also slept longer than healthy controls, but reported poorer satisfaction of their sleep. Significant relationships were identified between the number of times an IBS patient woke up, the severity of their abdominal pain, and the days they were symptomatic.

Healthy controls did not experience any significant

change in abdominal pain and both groups did not have any change in their diarrhea or constipation bowel patterns. Sleep quality also had an impact on emotional status, which suggested that sleep affecting anxiety and depression, impacting reporting of abdominal pain symptoms.

HORMONE REPLACEMENT THERAPY AND FECAL INCONTINENCE RISK IN POST-MENOPAUSAL WOMEN

Staller K, Townsend MK, Khalili H, Mehta R, Grodstein F, Whitehead WE, Matthews CA, Kuo B, Chan AT. Menopausal hormone therapy is associated with increased risk of fecal incontinence in women after menopause. *Gastroenterology.* 2017; 152: 1915-21

Use of hormone replacement therapy (HRT), specifically estrogen only replacement therapy, was associated with an increased risk for developing fecal incontinence (FI). This remained true for individuals who were currently using HRT or had used it previously when compared to women who did not use HRT.

This study collected information from female registered nurses who completed a survey from the Nurse's Health Study. This annual survey began in 1976 and continues today to observe longitudinal health conditions, though questions referencing fecal incontinence began in 2008.

Women who were on HRT for any duration had a higher risk for developing FI and the longer a woman used HRT, the risk for developing FI increased. Women who were currently on HRT were more likely to have used

oral contraceptives, had surgical or radiation induced menopause, and were younger when menopause started.

Stool consistency did not play a significant factor in incidence for fecal incontinence. It was suggested in the article that adding progestin to estrogen only HRT may help stave off changes to supportive connective tissues in the pelvic floor.

PHASE II RCT OF IBS-C DRUG TENAPANOR SHOWS PROMISE IN CLINICAL TRIALS

Chey WD, Lembo AJ, Rosenbaum DP. Tenapanor Treatment of Patients With Constipation-Predominant Irritable Bowel Syndrome: A Phase 2, Randomized, Placebo-Controlled Efficacy and Safety Trial. *Am J Gastroenterol*. 2017 May;112(5):763-774

A phase II randomized controlled trial is investigating the drug Tenapanor for the treatment of constipation predominant irritable bowel syndrome (IBS-C). The drug works by reducing the amount of sodium and phosphate that is absorbed within the GI tract. This increases the fluid volume in the intestine, resulting in softer stools.

Patients who were randomized to receive Tenapanor had more frequent spontaneous bowel movements when compared to those who received the placebo medication. There were also differences between groups who received different doses of Tenapanor. Patients who received the 50mg twice a day dose had a significantly greater reduction in abdominal discomfort, bloating, cramping, and fullness compared to the 20mg twice a day dose.

Recorded adverse events associated with taking the medication were diarrhea, headache, nausea, urinary tract infection, and abdominal pain. There were serious adverse events reported in the clinical trial, however the study investigator did not believe they were related to the study drug. Phase III of the clinical trials for Tenapanor is currently underway.

CHANGES IN GI MICROBIOTA AND EFFECTS OF PROBIOTICS IN PATIENTS WITH FUNCTIONAL DYSPEPSIA

Igarashi M, Nakae H, Matsuoka T, Takahashi S, Hisada T, Tomita J, Koga Y. Alteration in the gastric microbiota and its restoration by probiotics in patients with functional dyspepsia. *BMJ Open Gastroenterol*. 2017 May 1;4(1):e000144.

The study of probiotics for gastrointestinal disorders has been an increasingly popular field of study, as more research about gut microbiota has shown dysbiosis in microbial colonies can exacerbate abdominal symptoms.

Yogurt made with LG21 bacteria, (*Lactobacillus gasseri*) were studied by Japanese researchers on patients with functional dyspepsia and healthy controls over a 12 week period.

Functional dyspepsia (FD) patients reported improvements in epigastric pain and postprandial distress. FD patients also had higher amounts of bile acid in gastric fluids than healthy controls at baseline, but there were no significant changes in bile acid due to yogurt ingestion.

Microbiota colonies in functional dyspepsia patients changed after eating the yogurt, in that the bacterial colonies were altered enough to look similar to that found in healthy controls. Specific bacteria colonies that were changed included increases in *Acidobacteria* and decreases in *Proteobacteria*.

The authors of the paper suggested the increase in bile acids in the gastric contents of FD patients, not associated with a physical disorder or metabolic disease, may have a role to play in altering the microbiota within the gut and play a role in the development of FD. They also pointed out that many patients with FD in Japan also have an overlapping GI disorders such as irritable bowel syndrome (IBS) and small intestinal bacterial overgrowth (SIBO), which would correlate with a dysbiosis of bacterial colonies.

DIARRHEA ASSOCIATED FECAL INCONTINENCE: HOW MODERATING STOOL CONSISTENCY CAN HELP REDUCE SYMPTOMS

and re-introduced one at a time to identify any that exacerbate symptoms. Everyone tolerates foods differently, so what worked for one person will not work for all individuals. It is important to seek the advice of a nutritionist or a registered dietician when excluding foods to ensure that you do not have a nutritionally deficient diet. To find a registered dietician near you, www.eatright.org/find-an-expert.

Excessive consumption of high fat foods puts a toll on many organs in the GI tract. The liver produces bile, a substance used to break down fat in the small intestine, and is stored in the gallbladder. Bile is normally released into the small intestine when food is eaten. When a high fat meal is consumed, this can lead to an increase in bile and bile salts being produced. Normally, bile salts are re-absorbed in the small intestine, but if excessive bile salts remain unabsorbed and reach the colon, it can irritate the intestinal lining and lead to increased secretion and water in the colon. [5,7,9] This type of diarrhea, where excessive bile salts are unabsorbed and reach the colon, is called bile acid diarrhea (BAD) and is prevalent in individuals with irritable bowel syndrome (IBS) with diarrhea and those who have had their gallbladders removed.[5,7]

FODMAPs are a class of poorly digestible carbohydrates. Recent publications [8,9] have indicated that a low-FODMAP diet is associated with positive outcomes, including a reduction in pain, bloating, and diarrhea. Poorly digested and unabsorbed carbohydrates cause an increase in osmotic fluid retention in the small and large intestine and provides additional food sources for the bacteria in our gut. When the bacteria feed off the unabsorbed carbohydrates, they generate excess gas as a waste product.

Foods containing artificial sweeteners are safe to eat. However, if eaten in excess, can cause diarrhea, bloating, and excess gas. Artificial sweeteners such as sorbitol, mannitol, and xylitol, have been associated with causing diarrhea.[9] These molecules are associated with FODMAPs as they are sugar alcohols or polyols. Artificial sweeteners can be found in multiple products, such as sugar-free chewing gum, sugar-free candy, and sugar-free foods[5,6].

Caffeinated drinks such as coffee and energy drinks are also associated with increasing GI motility. Caffeine

intake has been associated with a loosening of stools. [5,9]

Modifying the food we eat can ease some of the symptoms of diarrhea and help reduce incidences of fecal incontinence. Many of the above diet recommendations suggest limiting foods that increase osmotic fluid movement into the large intestine and colon. By removing the fluid burden of the stool, you increase the density and firmness of the stool consistency, increasing the likelihood of the anal sphincter to hold back stool. [10]

OVER-THE-COUNTER MEDICATIONS

Supplements are not regulated by the Federal Drug Administration (FDA) and therefore do not go through the rigorous clinical trials and scientific review that are required for prescribed medications. Manufacturers that develop the supplement are not required to report adverse effects. [12] Utilizing clinical trials to evaluate the safety and efficacy of herbs and supplements are important. Peppermint oil is listed as an antispasmodic which means it relaxes smooth muscles in the GI tract and has been associated with improvement in IBS symptoms; however they are associated with increased upper gastrointestinal disorders, such as heartburn and belching because of the relaxation of smooth muscles. [13]

Fiber supplements can help moderate stool consistency. Not all fiber is equal and it is important to know the difference between soluble fiber and insoluble fiber. Soluble fiber helps to absorb water in the GI tract and reduce the occurrence of diarrhea. Soluble fiber gels and holds water in the large intestine and colon, increasing the bulk of the stool, while insoluble fiber cannot gel or collect water and may make diarrhea worse.[10]

Loperamide, also known as Imodium, is an over-the-counter medicine that works by slowing down GI motility and increasing the time it takes for water to be absorbed by your bowel, and thus increasing stool bulk.

Over-the-counter (OTC) medications can help with moderate diarrhea to normalize stool consistency. The most common OTC medication for diarrhea is

loperamide, also known as Imodium. Imodium helps reduce diarrhea by slowing down gastric motility, allowing more water to be absorbed within the gut. All medications vary from person to person on how well they act and any associated side effects. You should always speak with your doctor when adding new medicines to ensure they are safe and will not interact with any other medications you are taking.

Written by Stefanie Twist

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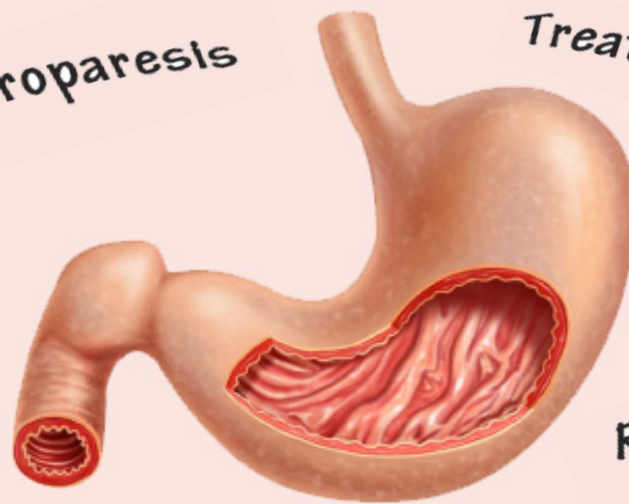


This chat is hosted by Dr. Linda Nguyen, MD, Clinical Associate Professor at Stanford Health Care



Gastroparesis

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