

Functional Abdominal Pain

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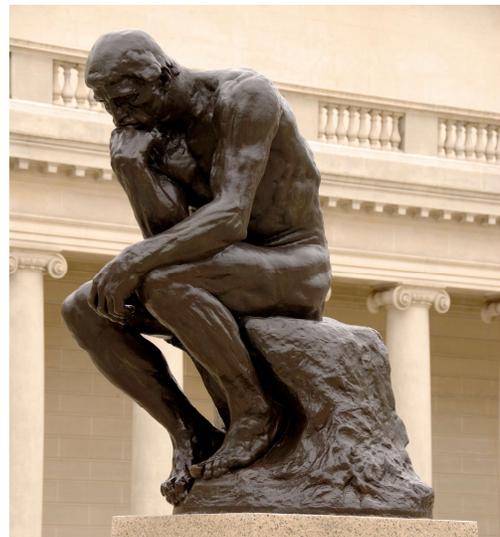
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Questions: Functional Abdominal Pain

- What is the definition?
- Is it a childhood definition and it's IBS in adults or is it something else?
- Is this made up? Something to call a collection of symptoms we don't have another explanation for?
- What is the physiology?
- Meds that work?
- Alternative approaches that works?
- What doesn't work?
- How do I get through this visit in 20 min?
- How to find community resources?



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Case #1: Sara

- 35 y/o female with PMhx of anxiety and depression with generalized abdominal pain, comes and goes
- Stooling and flatuses have improved symptoms previously but recently it has been severe enough to miss work (1-2 days a month). Works high stress job.
- Has constipation > 25% of the time, >25% of days diarrhea, <50% of days normal stool. Has been present for “years.”
- No blood in stool
- Previous treatments have included exercise, laxatives, anti diarrheal
- Frustration that nothing has helped. Feels like her doctors think it’s “all in my head” and “I have a nervous bowel”
- You’re considering functional abdominal pain as one of your diagnosis



By Helgi Halldórsson from Reykjavik, Iceland - Pretty Girl Rock, CC BY-SA 2.0, <https://commons.wikimedia.org/w/index.php?curid=3377811>

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ARS #1: What is a Functional Abdominal Pain?

1. A term physicians use when they can't find anything wrong with a patient who continues to have abdominal pain symptoms that don't make any sense. Often a diagnosis in hard to deal with or “crazy” patients
2. It is a common symptom of anxiety and is often cured by effective treatment of anxiety
3. A disorder in which functioning of the bowel is perceived as dysfunctional and is defined by patients reported symptoms. It does not have specific organic or motility sources to explain it after an appropriate workup has been performed
4. A perfect reason to refer to a sub-specialist

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GI Disorders Sub Class		
Organic	Motility	Functional
Diagnosed with morphology and pathology; Measured by histology changes, you can see and touch it	Diagnosed by disfunction in motility, Measured by motility dysfunction, visible explanation	Diagnosed by the illness experience, Measured by patient experience (Rome Criteria), Psychosocial experience
IBD, Esophagitis, Peptic Ulcer, Colon Cancer	Gastroparesis, esophageal spasm, pseudo obstruction	Irritable Bowel Syndrome, Functional Dyspepsia, Functional Constipation

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<p>ROME IV : Functional Gastrointestinal Disorders:</p> <p>Disorders of Gut–Brain Interaction</p> <p>A. Esophageal Disorders</p> <p>A1. Functional chest pain A4. Globus A2. Functional heartburn A5. Functional dysphagia A3. Reflux hypersensitivity</p> <p>B. Gastroduodenal Disorders</p> <p>B1. Functional dyspepsia B3. Nausea and vomiting disorders B1a. Postprandial distress syndrome (PDS) B3a. Chronic nausea vomiting syndrome (CNVS) B1b. Epigastric pain syndrome (EPS) B3b. Cyclic vomiting syndrome (CVS) B2. Belching disorders B3c. Cannabinoid hyperemesis syndrome (CHS) B2a. Excessive supragastric belching B4. Rumination syndrome B2b. Excessive gastric belching</p> <p>C. Bowel Disorders</p> <p>C1. Irritable bowel syndrome (IBS) C2. Functional constipation IBS with predominant constipation (IBS-C)</p>	<p>E1a. Functional gallbladder disorder E1b. Functional biliary SO disorder E2. Functional pancreatic SO disorder</p> <p>F. Anorectal Disorders</p> <p>F1. Fecal incontinence F2c. Proctalgia fugax F2. Functional anorectal pain F3. Functional defecation disorders F2a. Levator ani syndrome F3a. Inadequate defecatory propulsion F2b. Unspecified functional anorectal pain F3b. Dyssynergic defecation</p> <p>G. Childhood Functional GI Disorders: Neonate/Toddler</p> <p>G1. Infant regurgitation G5. Functional diarrhea G2. Rumination syndrome G6. Infant dyschezia G3. Cyclic vomiting syndrome (CVS) G7. Functional constipation G4. Infant colic</p> <p>H. Childhood Functional GI Disorders: Child/Adolescent</p> <p>H1. Functional nausea and vomiting disorders H2a1. Postprandial distress syndrome H1a. Cyclic vomiting syndrome (CVS) H2a2. Epigastric pain syndrome H1b. Functional nausea and functional vomiting</p>
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Can my Mental State Really Affect my Physical State?

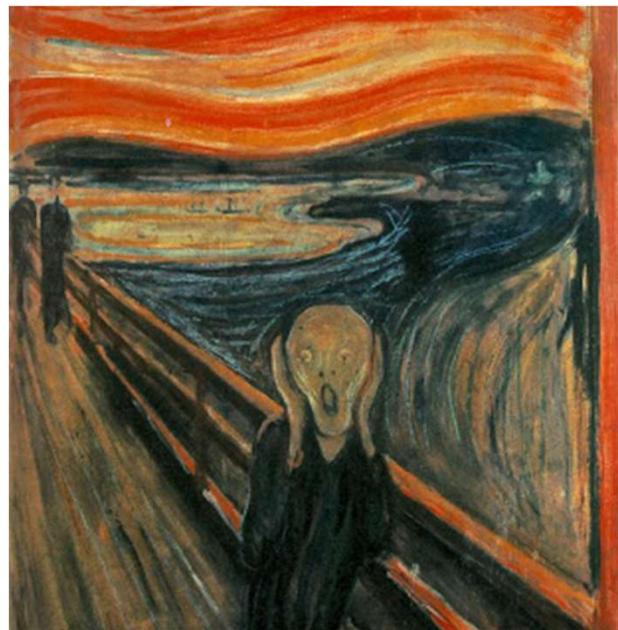


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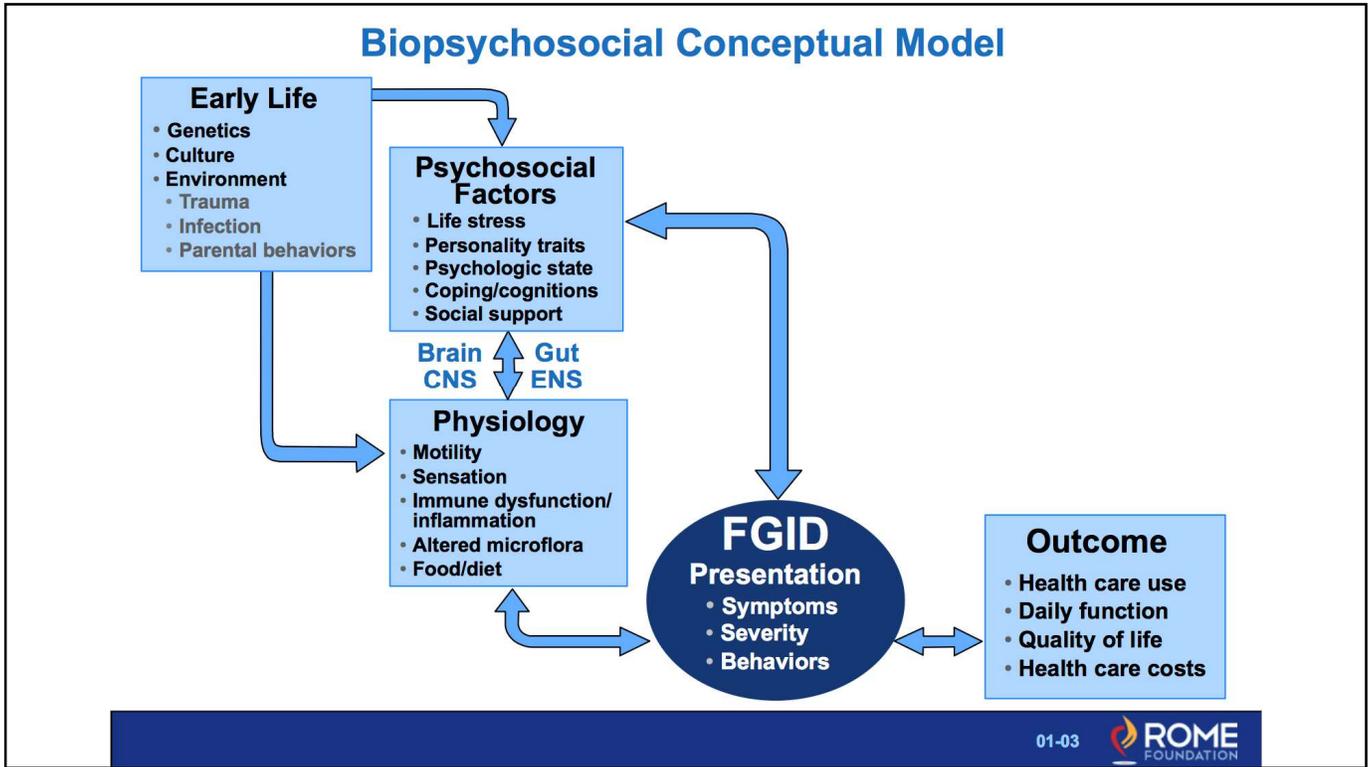
Can Emotions Results in Disease?

The possibility that passions or emotions could lead to the development of medical disease was first proposed by the Greek physician Claudius Galen

This supposition is not surprising because we observe the effects of intense emotion on autonomic arousal, leading to diarrhea, the production of chest or abdominal pain, or even sudden death



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Functional Disorder

- Functional disorders are better thought of as disorders of the brain gut interaction
- Microbial dysbiosis - overgrowth
- Altered immune function
- Altered gut signaling (visceral sensitivity)
- Central nervous system dysregulation
- The aspects of gut motility that appear most relevant to the FGIDs are contractile activity and tone, compliance, and transit

BRAIN-GUT AXIS

The diagram illustrates the Brain-Gut Axis. It shows the **Central Nervous System** (Midbrain) and **Peripheral Nervous System** (Intestinal Afferent Receptor) connected by **Central Neuromodulators** and **Peripheral Neuromodulators**. A **Pain Gate** is shown where **Inhibitory Pathways** (green arrows) and **Excitatory Pathways** (red arrows) interact. The **Gate Control Theory** is depicted as a circular diagram with a minus sign (-) and a plus sign (+). The **ROME FOUNDATION** logo is in the bottom right corner.

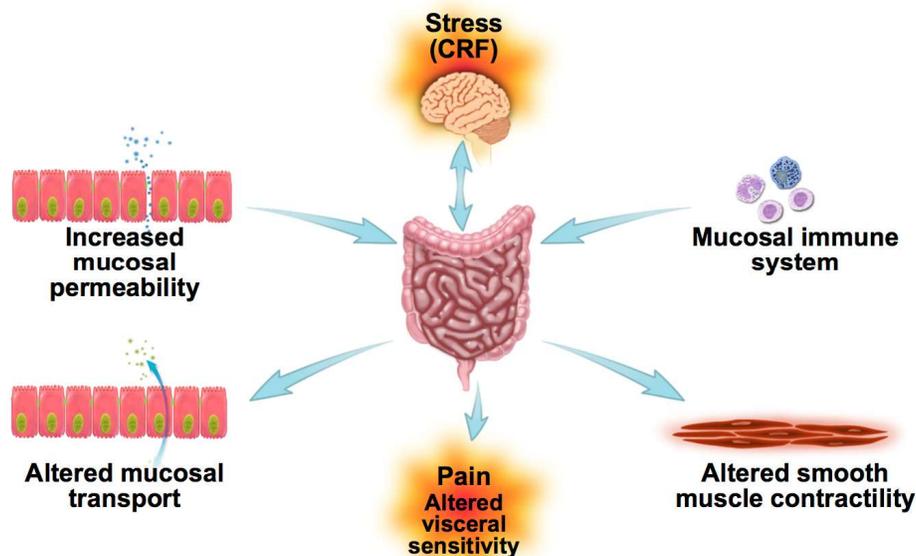
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Can we measure what's wrong?

- GREATER GAS -bloating vs control (176 vs 199 ml of bowel gas) IBS Gas Diffusion scan
- POOR PERISTALSIS -Lipid perfusion+ air & saline (12 ml/min)- increased gas retention and increased transit times IBS patients (500cc IBS vs 22cc retention control)
- DYSFUNCTIONAL DIAPHRAGM - CT scans belly measurements- IBS vs control- increase ab girth, distention, no increase in gas, no difference in diaphragm position, no difference in lumbar lordosis. Distention from something else besides gas?
- ALIMENTARY HYPERSENSITIVITY - Colonic Ballooning- 6% of controls vs 55% of IBS 3.4 cm pain varied in position
- POOR DIGESTION - 2 cups of lactose vs 2 cups predigested milk vs 2 cups fructose, fructan rich

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Effects of Stress on the GI Tract



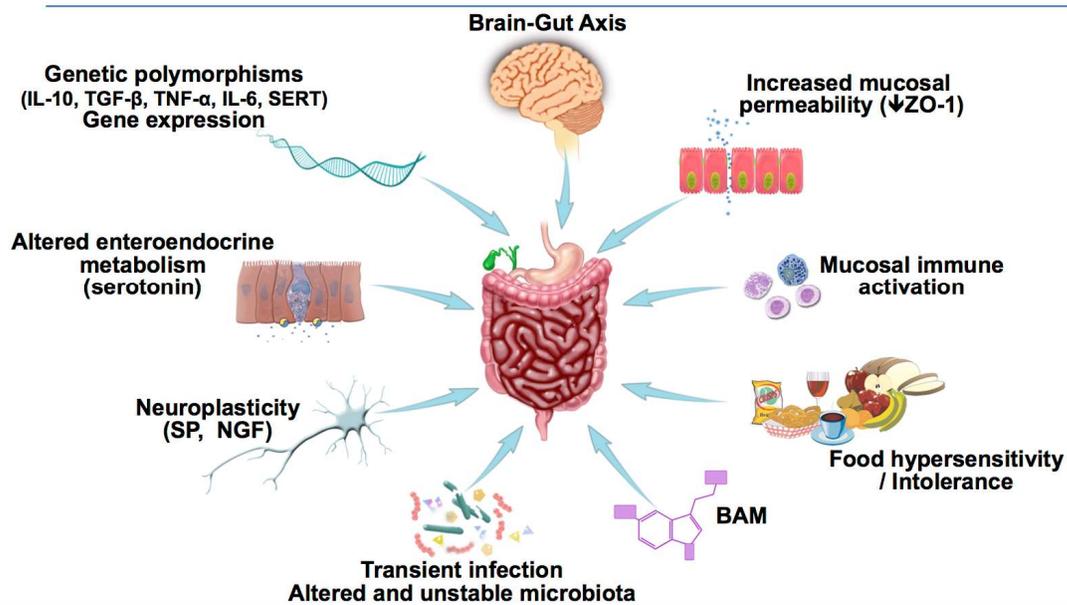
Barbara, et al. *J Neurogastroenterol Motil* 2011; 17:349

02-22 BGVM 1



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Microenvironment and FGIDs



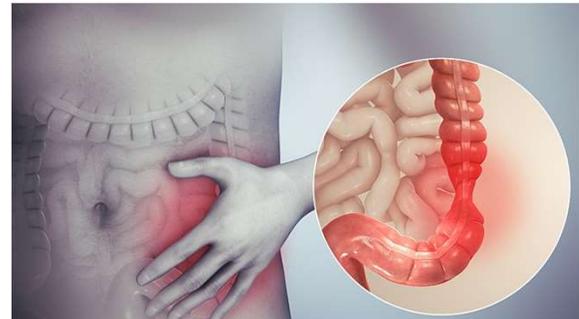
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Where Can It Go Wrong?

- Motility, Sensation, Absorption, Secretion, Digestion, Intestinal Barrier
- 90% of afferent info from gut to the brain is unconscious is part of maintaining homeostasis. Gut is densely innervated
- Gut decisions about permeability, tone, compliance, peristalsis are made without any conscious input
- Meals can create problems
- Afferent and efferent communication can, like any process, be manipulated which results in perceived pain and dysfunction



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Symptoms are generated based on a complex interaction among factors such as microbial dysbiosis within the gut, altered mucosal immune function, altered gut signaling (visceral hypersensitivity) and central nervous system dysregulation of the modulation of gut signaling and motor function.

D Drossman, W Hasler. Gastroenterology. 2016;150:1257-1261

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The Gut : The Hot Tub of the Body



3 day old bean burrito from taco bell, GI bug from your nephew's daycare, your **parents hate your** girlfriend, your gut flora grows on nothing but nacho cheese Doritos, Everyone in your family is a little farty....



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Case #2: Claire

- 12 y/o with abdominal pain, started a few months ago. Pain started more consistently in Aug, two weeks after starting school. Pt is a good student, and reports enjoying school and friends, denies anxiety around school. Of note, symptoms did improve over Christmas break. Normal stools, no diarrhea or constipation.
- Pain has progressively gotten worse until now, child is unable to go to school because pain is so severe. Describes the pain as big blotches of black, red and white on her stomach.
- OTC medication like bismuth, acetaminophen, ibuprofen have little benefit.
- Heating pads, warm baths have helped.
- Pain initially started around umbilicus, then became diffuse throughout abdomen.
- No changes in stool, no blood, no diarrhea or constipation. Has not started period yet.



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- PMHx- Born during hurricane Katrina, close to center. Mom had associated stress after hurricane, poor breast milk production, weight loss =14% at 2 weeks. Caught up and had otherwise been healthy.
- Some social anxieties, excessive worry about getting picked up late from school, preschool or kindergarten.
- Unable to function in 2nd grade due to stresses around other children getting in trouble and taking ownership of their bad behavior.
- PSHx, none, Allergies-None,
- FHx-Mom with situation anxiety otherwise NC
- Soc Hx- Lives with family, no smoke or drug exposure. Works occasionally babysitting.

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ARS #2: What parts of the history help us make the diagnosis?

- 1. Menstrual history
- 2. Lack of Red Flag symptoms
- 3. Location
- 4. Lack of benefit from medication
- 5. Benefit by heat
- 6. All the above



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History

- “How did this start? Tell me your story...” (don’t interrupt the story just wait, there will might be some crying. This is part of the therapy)
- Red Flags (blood in the stool, diarrhea, waking up from sleep, emesis)
- What does your stool look like? (Bristol Stool scale 1-7)
- What symptoms (bloating, diarrhea, constipation, pain location and frequency)
- What’s the timeline (were there stressful situations, school, moves, friends)
- Fhx of GI diseases. (Organic-ex celiac, IBD, vs functional ex IBS)
- What work up has been done? (labs, endoscopy, stool studies)
- Meds (tried and currently taking)
- What are you most worried this is?

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Red Flags and Possible Meaning		
Red Flags History	Physical Exam Findings	Possible Disease
Localized Pain RUQ/ LUQ	Confirmation of localized pain	Gallbladder disease (RUQ), IBD (LUQ pain)
Weight loss	Confirmed weight loss	Malabsorption (celiac), Cancer
Blood in stool, change in caliber of stool.	+ fecal occult, abnormal rectal exam, abnormal colonoscopy	Hemorrhoids, colon cancer, rectal cancer, anal fissures
Change in color	Confirmation on stool exam	Gallbladder disease (white), Rapid transit (green), Undigested food (corn, beets) vs Blood- IBD, hemorrhoids, anal fissures
Recurrent UTI / Void dysfunction	Pain in pelvis	GI Fustula
Emesis	Epigastric pain	Hiatal Hernia, Esophagitis, Webs, strictures, etc
Fever		Infectons source, IBD, Cancer
Skin Color changes	Jaundiced	Cancer, gallbladder disease, liver disease
Change in bowel habits		Cancer, IBD,

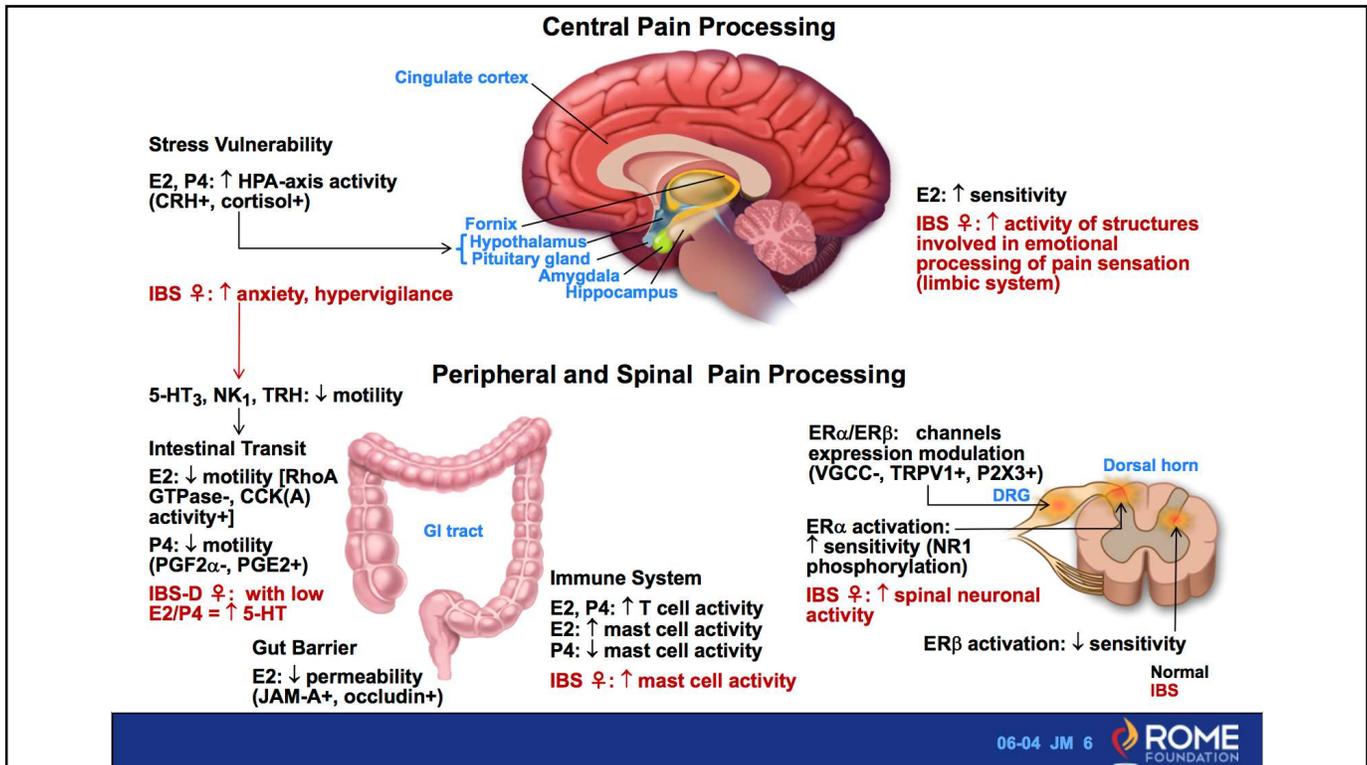
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Brain-Gut Axis in Real Life

- Sex hormones modify flora and motility, more pronounced in females
- Social stress affect perception of pain
- Perception is huge in pain



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Functional Pain Clues

- Lack of Red Flags
- No other conditions fit the diagnosis better
- Diffuse pain- can be persistent
- Situational- may be worse with stressors (school, work, relationships)

IBS appears to be more complex and may result from a combination of factors relating to motility, visceral hypersensitivity, mucosal immune dysregulation, alterations of bacterial flora, and CNS–enteric nervous system dysregulation.”

Douglas Grossman. [Gastroenterology](#), Volume 150, Issue 6, May 2016, Pages 1262-1279.e2

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Case #3: Holly

- 40 y/o female with many years of on again off again abdominal pain and intermittent diarrhea. She has usually been able to function with it, but her new job has increased stress and does not allow her the ability to immediately use the bathroom. No red flags.
- >25% of her stools are watery and loose, otherwise are normal and formed. Pain is most pronounced when stools are loose. Pain is usually worse after the bowel movement. Denies any blood, or family hx of IBD or colon cancer.
- PE- WNL



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ARS #3: Does she have functional abdominal pain?

1. Yes
2. No



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IBS Diagnostic Criteria

Rome III

A patient might have IBS if they have had recurrent **abdominal pain or discomfort*** for at least three months, with onset at least six months previously, and if this has been associated with two or more of the following:

- improvement with defecation; and/or
- onset associated with a change in frequency of stool; and/or
- onset associated with a change in form (appearance) of stool

Rome IV

A patient might have IBS if they had recurrent **abdominal pain** on average at least **one day/week** in the last three months, associated with two or more of the following criteria:

- **related to defecation**
- associated with a change in frequency of stool
- associated with a change in form (appearance) of stool

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ARS #4: What is her diagnosis?

(>25% of her stools are watery and loose, otherwise are normal and formed)

1. less than 25% (type 1 & 2), Greater than 25% diarrhea (Type 6 & 7) = IBS-D
2. Greater than 25% constipation, less than 75% normal = IBS-C
3. Greater than 25% Diarrhea, Greater than 25% constipation, less than 50% normal = IBS- mixed
4. Patient with changes in the bowel without meeting any of the above criteria. IBS-U



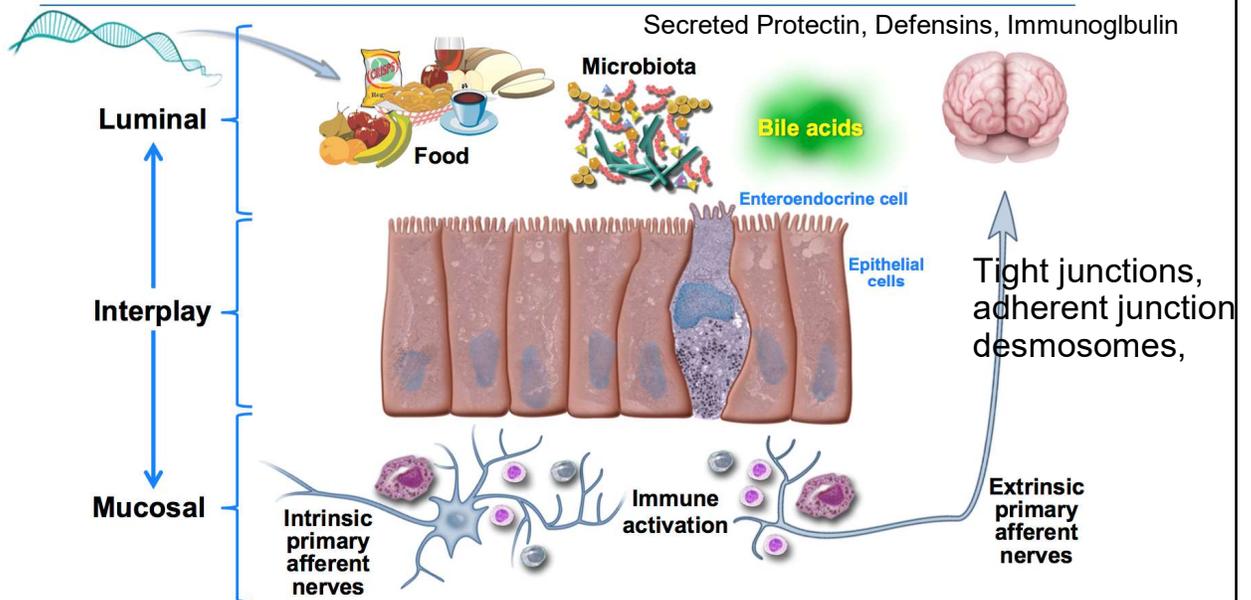
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IBS Subtypes - ROME IV Diagnostic Criteria

		IBS-D (diarrhea predominant)	IBS-C (constipation predominate)	IBS-M 9 (Mixed)	IBS-U
	Type 1	less than 25%	greater than 25%	greater than 25%	Meet criteria for IBS without meeting criteria for any other subtype
	Type 2				
	Type 3				
	Type 4				
	Type 5				
	Type 6				
	Type 7	greater than 25%	less than 25%	greater than 25%	

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Pent-Up Mechanisms, Bottom-Up Signaling



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ARS #5: What is the next appropriate step?

- 1. CBC, CRP, and Fecal WBC
- 2. Abdominal x-ray, Colonoscopy, Fecal Occult
- 3. Stool Calprotectin Bile Acids, IgA Tissue Transglutaminase & CBC
- 4. Gastroenterology referral

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Work Up for Functional Abdominal Pain (all columns that apply)

(Jama 2015; 319 (9) 949-958)

Your patient is alive	IBS-D (diarrhea predominant)	IBS-C (constipation predominate)	IBS-M 9 (Mixed)
CBC	Fecal Calprotectin or CRP	Conservative measures (laxatives, stool softeners, pro motility agents, r/o colon cancers)	Fecal Calprotectin or CRP
Age appropriate colon cancer screening	IgA TtT (tissue transglutaminase) +/- qualitative IgA		IgA TtT (tissue transglutaminase) +/- qualitative IgA
	If colonoscopy performed random biopsies done to r/o pathologic dx IBD	Consider referral to GI subspecialty if unresponsive to conservative measures.	Stool Diary
	SeHCAT, Fecal Bile Acids or Serum C4	GI work up may include rectal manometry, endoscopy	Possible imaging to r/o constipation

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What It Tells Us

(Jama 2015; 319 (9) 949-958)

Your patient is alive	IBS-D (diarrhea predominant)	IBS-C (constipation predominate)	IBS-M 9 (Mixed)
CBC= r/o blood loss and anemia, staging ulcerative colitis	Fecal Calprotectin or CRP if unavailable (Inflammatory vs non inflammatory)	Conservative measures (laxatives, stool softeners, pro motility agents, r/o colon cancers)	Fecal Calprotectin or CRP if unavailable (Inflammatory vs non inflammatory)
Age appropriate colon cancer screening	IgA TtT (tissue transglutaminase) +/- qualitative IgA (Celaic- fyi- IgA deficiency resulting in a false negative)		IgA TtT (tissue transglutaminase) +/- qualitative IgA (Celaic- fyi- IgA deficiency resulting in a false negative)
	If colonoscopy performed random biopsies done to r/o pathologic dx (IBD, microcytic colitis)	Consider referral to GI subspecialty if unresponsive to conservative measures.	Stool Diary
	SeHCAT, Fecal Bile Acids or Serum C4 (Bile acid malabsorption)	GI work up may include rectal manometry, endoscopy	Possible imaging to r/o constipation.

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Case #4 - Ahmed Treatment/Pharmacologic

- 35 y/o male with history of IBS with complete work up. Has been on PPI for abdominal pain in the past, which has not been helpful. He continues to have intermittent changes in bowel form with a chief complaint of pain.
- He is interested in trying some pharmacologic solutions to his dysfunction



By Dallai07 - Own work, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=90956396>

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ARS #6: What medications would you suggest?

1. Pain focused medication- acetaminophen, ibuprofen, low dose opioids
2. Topical relief- PPI, H2 Blockers, Fiber, kaopectate, sucralfate
3. Anti spasmodic- hyoscyamine, dicyclomine, peppermint oil
4. Anti Gas- simethicone, alpha galactosidase, bismuth, cholestyramine
5. Non Pharmacologic- probiotics, exercise, CBT, hypnotherapy
6. Combined therapy

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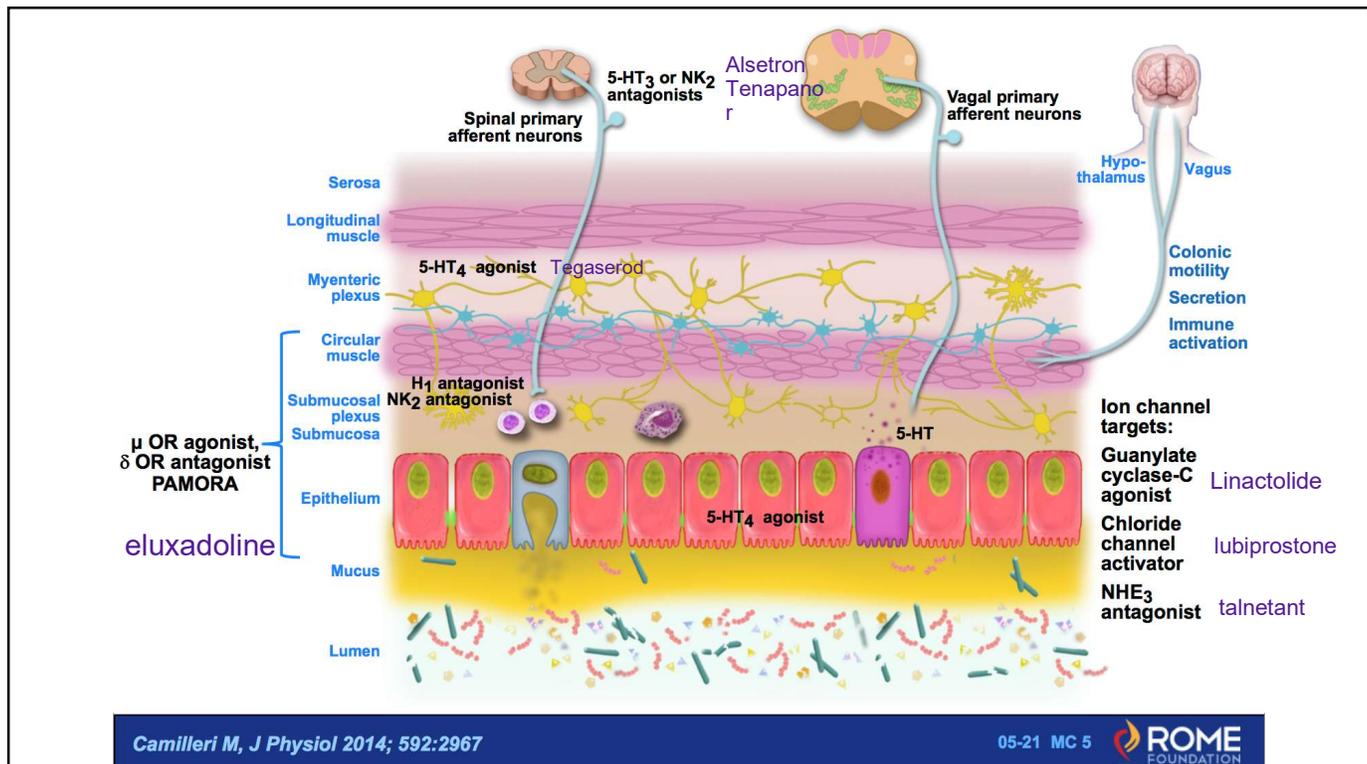
Type	IBS-C	IBS-D	IBS-U (Pain)
1-BM/day	Fiber (non soluble only) Polyethelene glycol, Osmotic Laxatives, Lubiprostone, Linaclotide, Tegaserod , H2O	Alosetron (women only, NNT=7), Ondansetron (5HT3 agonists), Eluxdolone (NNT-10) Loperamide	Tricyclic antidepressants NNT=5, (may worsen constipation) SSRI not effective
Bowel spasm/Ab pain	Peppermint oil, (NNT=2.5) SM relaxers Hyoscyamine, Dicyclomine (NNT=7)		
Gas Production/ Bloating	Probiotics (Combo of Lactobacillus, Streptococcus, B infantilism) (NNT=4-7) (VSL #3) Antibiotics-Rifaximin (longer lasting effect), Neomycin (NNT=11) Diet=FODMAPS, Gluten free		
Gas Absorption	Exercise - 3-5 vigorous times a week, NNT=7 for >50% improvement Bile acid sequestration- (Cholestyramine 50% reduction in bloating Flatulence)		
Stress reduction	CBT (NNT=4), acupuncture, hypnotherapy, herbal therapies		

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Pharmacology Overview Notes

- **IBS-C** 1st step- Fiber, osmotic laxative, if they fail
 - lubiprostone, linaclotide affect leakiness of membranes allowing more fluid into stool
 - tegaserod- motility stimulant W/D from market 2007 over heart attack and stroke concerns, reintroduced 2019 after large cohort found no correlation
- **IBS-D** 1st step- Loperamide- good for diarrhea, doesn't reduced ab pain
 - Alosetron- Black box warning (severe constipation, ischemic colitis) need to register to prescribe (women only approval)
 - Alosetron blocks serotonin effect on the intestine potentially reducing abdominal cramping, discomfort, urgency and diarrhea. It potentially slows small intestine and colonic transit time in women but not men
 - eluxadoline- works on mU opioid receptor in the gut slowing transit time. Avoid in patients without a gallbladder, or history of pancreatitis

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Pharmacology Overview Notes (cont.)

- TCA- start low does ex amitriptyline 25 mg at night
- SSRI show no benefit in IBS treatment, but not harmful in patients with depression and IBS
- Probiotic VSL#3 most data to help with bloating
- Bile Acid Binder (cholestyramine, colestipol, colesevelam)
 - 50% decrease in IBS-D colonic transit time.

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Probiotics

- Probiotics have shown promise in treating symptoms in IBS
- Bifidobacteria deficiencies = increase ab pain + bloating
- Probiotic alters central processing of emotional stimuli, as well as resting brain connectivity in sensory and affective brain circuits
- C. diff - Lactobacillus
- IBS/bloat - B. infantis 35624
- IBD - E. coli Nissle 1917-

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Case #5: Asha Treatment Non Pharmacologic

- 23 y/o female diagnosed with functional abdominal pain and IBS-D. She has tried multiple medication, and has had multiple side effects, and would like to avoid pharmacologic solutions. She is looking for alternative and non pharmacologic solutions for her pain.
- What non pharmacologic therapies are reasonable, data driven solution?
- Are they better than pharmacologic?



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ARS #7: What Non-Pharmacologic Therapies are helpful?

1. Hypnotherapy
2. Aroma Therapy
3. Massage
4. Cognitive Behavioral Therapy
5. Good doctor patient relationship
6. All the above



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Non Pharmacologic Therapies: Cognitive Behavioral Therapy

- **Cognitive behavioral therapy (CBT)** Short-term, goal-oriented psychotherapy treatment that takes a hands-on, practical approach to problem-solving. Its goal is to change patterns of thinking or **behavior** that are behind people's difficulties, and so change the way they feel.
- **How good is it?** Cochrane review (OR 5.67, 95% CI 1.18 to 27.32 in children). Meta analysis 41 adult RCT trials (n=2290) CBT medium effect ($d^- = 0.69$) immediately after treatment. Those with CBT had a 75% greater reduction in symptoms vs control which remained significant at 6-12 months.
- **How is it done?**
 - **Education-** Brain gut access, insight into roles of stress, help understanding why medication may not be the solution.
 - **Relaxation strategies** (engages parasympathetic, down regulating autonomic arousal, improving pain, increasing bowel motility) Deep breathing, guided meditation
 - **Cognitive Restructuring-** connecting disorders thinking and pain (fear of passing gas at a party, increase gut arousal increasing pain)
 - **Problem solving skills-** Some CBT approaches incorporate coping skills training to help patients identify uncontrollable stressors and practice implementing emotion-focused coping strategies (eg, acceptance, diaphragmatic breathing, cognitive restructuring, exercise, social support).
 - **Exposure Techniques-** Learning to control avoidance or "saftey" behaviors is common (won't go to a social situation without good access to bathroom)

Psychosocial interventions for recurrent abdominal pain in childhood. *Cochrane Database of Systematic Reviews* 2017, Issue 1. Art. No.: CD010971.

Gut Gastroenterol Hepatol 2016 Jul;14(7):937-947.e4.

Psychol Res Behav Manag. 2017; 10: 231-237.

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Non Pharmacologic Therapies: Hypnotherapy

- **Hypnotherapy** for IBS involves progressive relaxation, and then suggestions of soothing imagery and sensations focused on the individual's symptoms.
- **How good is it?** In children benefit in overall symptoms improvement (OR 6.78, 95% CI 2.41 to 19.07) reductions in pain intensity and pain frequency. long-term effect reported continued benefit of hypnotherapy compared to usual care after five years, with 68% reporting treatment success compared to 20% of controls ($P = 0.005$)
- 75% response rate to therapy- pt usually have great response or minimal to none. 81% of responders maintain improvements long term (5year f/u).
- Group and individual therapy effective (NNT=5)

Psychosocial interventions for recurrent abdominal pain in childhood. *Cochrane Database of Systematic Reviews* 2017, Issue 1. Art. No.: CD010971.

Gut. 2003 Nov; 52(11): 1623-1629.

Lancet Gastroenterol Hepatol 2019 Jan;4(1):20-31. doi: 10.1016/S2468-1253(18)30310-8. Epub 2018 Nov 23.

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Non Pharmacologic Therapies: Self Administered

- **Meditation**- Apps: Calm, Headspace, Meditation
- **Gratitude journaling**- May be helpful in controlling depression associated with IBS
- **Written self disclosure**- 3-20 min session, writing about deepest thoughts and feelings about the most distressing experiences of their life, minimal short term relief but improvement in frequency of abdominal pain at 6 months in children, not shown in adults



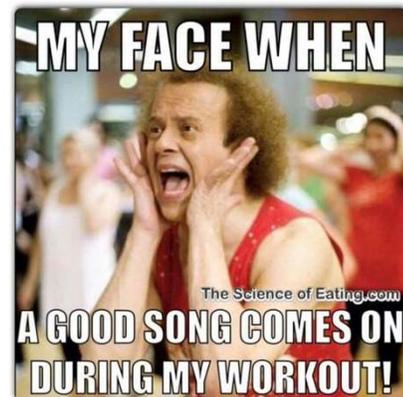
File name: "Meditation" from Italy / CC BY (https://creativecommons.org/licenses/by/2.0/) href="https://commons.wikimedia.org/wiki/File:Meditation_(7912377858).jpg" title="https://commons.wikimedia.org/wiki/File:Meditation_(7912377858).jpg" width="912" alt="Meditation (7912377858)"/>

Ruten, J. M. T. M. (2015). Functional abdominal pain disorders in children: therapeutic strategies focusing on hypnotherapy.

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Non Pharmacologic Therapies: Exercise

- Exercise- showed improvements in symptoms (NNT=5) and less likely worsen in symptoms over time (NNT=5)
- Yoga- No proven benefit, however may be good as a form of relaxation for some patients



<https://i.pinimg.com/originals/e0/74/5f/e0745f3296c23d443381899df6c9d66.jpg>

Am J Gastroenterol. 2011;106(5):915. Epub 2011 Jan 4.

Gastroenterology. 2018;154(3):529. Epub 2017 Nov 2

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Non Pharmacologic Therapies: Diet

- Food Allergy testing- Unproven benefit
- Fiber- Yes and No (All IBS, no benefit, IBS-C subgroup NNT=6)
- Lactose Avoidance?- Breath tests and avoidance, ethnicity
- Gluten Avoidance- Non-Celiac Gluten Sensitivity (Celiac r/o). Gluten vs Fructan vs Placebo
- Guar Gum (food thickener) - May be helpful in IBD-C, improved abdominal pain and improved perception of incomplete evacuations

Am J Gastroenterol. 2011;106(5):915. Epub 2011 Jan 4.

Gastroenterology. 2018;154(3):520. Epub 2017 Nov 2

Saudi J Gastroenterol. 2015 Mar-Apr; 21(2): 104-110

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Non Pharmacologic Therapies:Diet

- Restriction of gas producing foods vs FODMAPS- similar improvement
- Gas producing foods- (eg, beans, onions, celery, carrots, raisins, bananas, apricots, prunes, Brussels sprouts, wheat germ, pretzels, and bagels, alcohol, and caffeine)
- FODMAPS- much more restrictive. Reserved for people who don't respond to reducing gas producing foods
- 6-8 week elimination then reintroduction

Foods suitable on a low-fodmap diet

fruit	vegetables	grain foods	milk products	other
fruit bananas, blueberry raspberry cantaloupe, cranberry dates, grape grapefruit, honeydew lemon, kiwifruit, lemon lime, mandarin, orange passionfruit, papaya raspberry, rhubarb, rockmelon, star apple strawberry, tangerine low fructose, as in and berries	vegetables aralia, bamboo shoots, bean shoots, bok choy cauliflower, celery, choko, chay sun, endive ginger, green beans, lettuce, olive, parsnip, potato, pumpkin, red capsicum (bell pepper), spinach, sweet potato, zucchini other arrowroot, millet, puffed quinoa, sorghum, teff, yucca cassava beet, chili, coriander, ginger, lemongrass, mint, onion, parsley, celeriac, fennel	cereals gluten-free bread or cereal products biscuit 100% spelt bread rice oats polenta other ammonium, millet, pearl, quinoa, sorghum, teff, yucca cassava beet, chili, coriander, ginger, lemongrass, mint, onion, parsley, celeriac, fennel	milk lactose-free milk*, oil milk*, rice milk*, soy milk* *not for infants cheeses hard cheeses, and brie and camembert yoghurt lactose-free varieties ice-cream substitutes greek yogurt butter substitutes olive oil	tofu miso "aged" (sour) lactose, glucose, or artificial sweeteners not ending in "-ol" honey substitutes golden syrup* maple syrup* molasses, treacle "hard" cheeses butter substitutes olive oil

Eliminate foods containing fodmaps

excess fructose	lactose	fructans	galactans	polyols
fruit apple, mango, nashi, pear, dried fruit in natural juice watermelon vegetables fructose: high fructose corn syrup large: total fructose: dose concentrated fruit sauces, large serves of fruit, dried fruit, fruit juice honey corn syrup, fructose	milk milk from cow, goats or sheep, custard, ice cream, yogurt cheeses soft unpurified cheeses eg cottage, cream, mascarpone, ricotta	vegetables artichoke, asparagus, broccoli, brussels sprouts, cabbage, eggplant, leek, garlic, leek, onion, onion (all), shallots, spring onion cereals wheat and rye, in large amounts eg bread, crackers, cookies, couscous, pasta fruit custard apple, pearl/onion, watermelon miso/lactoseous miso, dandelion, inulin, pistachio	legumes labeled beans, chickpeas, kidney beans, lentils, soy beans cereal wheat and rye, in large amounts eg bread, crackers, cookies, couscous, pasta fruit custard apple, pearl/onion, watermelon miso/lactoseous miso, dandelion, inulin, pistachio	fruit apple, apricot, avocado, blackberry, cherry, kumquat, lychee, nashi, nectarine, peach, pear, plum, prune, watermelon vegetables cauliflower, green capsicum (bell pepper), mushroom, sweet corn vegetables aspartame (A20), mannitol (A21), sorbitol (S62), maltitol (S65), xylitol (S67)

Gastroenterology. 2015;149(6):1399. Epub 2015 Aug 5.

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Non Pharmacologic Therapies: More to Come

- Acupuncture- May be helpful (meta analysis of 6 RCT's showed small benefit in abdominal pain)
- Homeopathy- few low quality studies showing marginal benefit (30 pt improvement on 250 pt scales)
- OMT- few small studies (n=204 5 5 RCT) showing improvement in abdominal pain immediately and at 3 months
- Placebo?- Very High response in IBS (Normal ~30%, IBS ~50%)



The Journal of the American Osteopathic Association, June 2014, Vol. 114, 470-479. doi:<https://doi.org/10.7556/jaoa.2014.098>

[World J Gastroenterol. 2014 Feb 21; 20\(7\): 1871-1877.](https://doi.org/10.7556/jaoa.2014.098)

Cochrane Database Syst Rev 2019 Sep 4;9(9):CD009710. doi: 10.1002/14651858.CD009710.pub3

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You are the Super Hero!

- **Believe** your patient!
- **Validate** their symptoms.
- **Empathize** is HUGE in providing care for patients
- Beliving, Validating, Empathizing will build relationships of trust which by themselves are effective in improving symptoms.
- General Principles -get patients back to normal life, school, work, diet, relationships, etc.



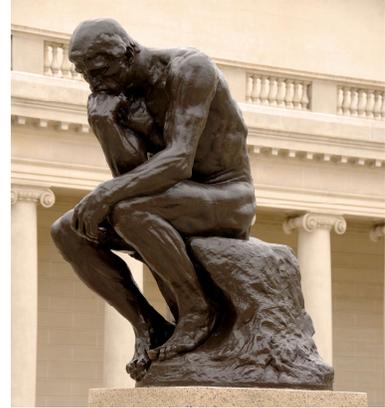
The great mistake in the treatment of disease is that there are physicians for the body and physicians for the soul and the two can not be

[Psychol Health Med 2018 Jul;23\(6\):674-684. doi: 10.1080/13548506.2017.1417613. Epub 2017 Dec 20.](https://doi.org/10.1080/13548506.2017.1417613)

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Questions

- What is the definition and sub sets? [Functional Bowel Disorder](#)
- Is it a childhood definition and it is IBS in adults or is it something else? [IBS is one type of Functional Abdominal Pain](#)
- Is this made up? Something to call a collection of symptoms we don't have another explanation for? [Well Defined ROME IV](#)
- What is the physiology? [Complex, works at the microscopic level](#)
- Are there meds that work? [Yes](#)
- Alternative approaches that work? [Maybe better then meds!](#)
- What doesn't work? [SSRI, Blaming patients, Telling them it's all in their heads.](#)
- How do I get through this visit in 20 min? [You CAN! Decide subset, r/o red flags, basic lab orders and follow up.](#)
- How to find community resources? [Internet](#)

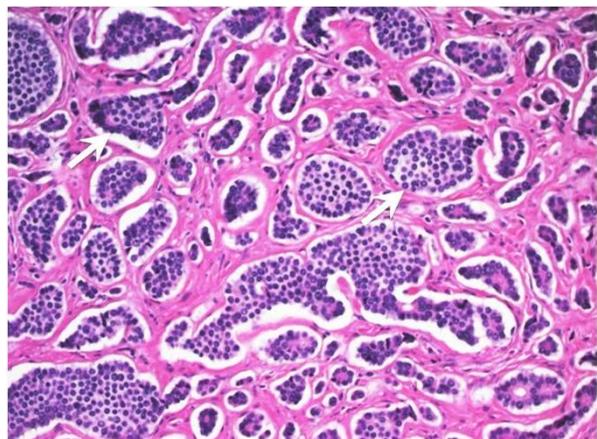


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Practice Recommendation

Pathophysiology

- Functional bowel disorders are complex changes that occur on microscopic level and we are just starting to understand
- Just because we can't see it, doesn't mean it's not there!



Urwat T. Vusqa , Stuti Patel , Mameon Ur Rashid , Deepika Sarvepalli , Abu H. Khan / CC BY (https://creativecommons.org/licenses/by/3.0)

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Practice Recommendation

History & Physical

- Rule out alternative diagnosis
- Watch for red flags
- Listen!
- Validate!
- Empathize!



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Practice Recommendation

Work up

- Determine subset diagnosis
- Order labs as appropriate



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Questions?



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IBD-D Diarrhea Variant Goal Decrease excessive Bowel movements	Treatment /Pharmacology	Dose	Benefit / Cost
Regular Bowel Movments	1-2 bowel movements a day		
loperamide	Binds Gut wall opioid receptor, Increase sphincter tone	4 mg po x 1 then 2 mg with each additional loose stool max 16 mg/ day	Decreased stool frequency, but no change in bloating abdominal discomfort or global IBS symptoms \$240/month
phenobarbital (P)/hyoscyamine (H)/atropine (A) /scopolamine (S)	A + H + S = antagonized acetylcholine at muscarinic receptor relax GI smooth muscle, decrease GI motility, And decrease GI secretion, P = sedation	16.2/0.1037/0.0194.0.0065 Tabs 1-2 tabs po q6-8hr	Minimal available data, Appears to help non GI symptoms better than GI (sleep disturbances, nervousness vs ab pain and bloating) (\$1300/ month)
eluxadolone	Binds to various opioid receptors inhibiting peristalsis	100 mg po bid	NNT=12.7 Improvement in diarrhea and ab pain (combined score endpoint NNH = 21 constipation (\$1000/ month)
ondasetron	5HT3 receptor antagonist	4-8 mg po q8hr	Improves stool consistency, frequency, urgency, no difference in abdominal pain (\$13-1000 depending on formulation)
alosetron (Female only)	5HT3 receptor antagonist	0.5mg-1mg po BID	Global improvement in IBS symptoms, Was withdrawn from US market due to SE, then reinstated with restricted access. NNT=7 \$700-1000/month
tegaserod,	5HT4 agonist		NNT=17 w/d from us market due to side effects.
Bile resin binders Cholestyramin Colestipo Colesvelam	Binds Bile acids which can cause increase stool transit times	Colesvelam 1.875 g po bid	Decrease stool transit times but 50% (4hrs) May increase bloating and constipation \$50-500 depending on formulation

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IBD-C Constipation Variant Specific Treatment	Dose	Mechanism of action	Benefit/ Harm/Cost
Goal = Regular Bowel Movements	Goal "1 Easy to pass bowel moment a Day"		
Fiber- Non Soluable	25-30 grams a day	Stool softening, increasing	May be beneficial in IBD-C only, in reducing constipation. Not Beneficial in IBS compared to placebo for ab pain/ bloating and generalized IBS symptoms \$5-10
Fiber- Soluble			No benefit
polyethylene glycol 3350	17 g qd-qid (titrate to goal)	Increases stool water retention	Improve symptomatic constipation but not abdominal bloating and pain \$12
Lubiprostone	8 mcg PO bid	Activates Chloride Channels increasing Fluid secretion and gut mobility.	Increased stooling (18% vs 10% placebo of patients with benefit) NNT =12.5 \$300
Linactolide	290 mpg po qd	Activates guanylate cyclase-C stimulating cCMP production to increase fluid secretion and mobility	Improved abdominal pain, Increased Bowel movements, (34% vs 21% placebo) NNT= 7.7 \$350
H2O	8 glasses a day	maintain hydration	Most authors agree a good idea, but minimal data to suggest benefit (no harm)

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IBD- Ab pain/ Spasm	Dose	Mechanism of Action	Benefit/cost
Antispasmodics			
Dicyclomine	20-40mg po qid	Antagonized acetylcholine at muscarinic receptors, smooth muscle relaxer, inhibits bradykinin, reduces histamine induced spasm	Beneficial NNT= 7 improvement in abdominal pain NNT= 5 Improvement in global assessment NNT = 3 for improvement in global symptom score \$ 5-20
Hyoscyamine	0.125-0.25 mg po q4 prn		
SSRI's &TCA's	citalopram, fluoxetine, paroxetine, amitriptyline, desirpramine, doxepin, imipramine, trimipramine	Various	NNT=5 ab pain improvement NNT=4 Global symptom score improvement (Cochrane review pooled all tca's and SSRI's in review)
Peppermint Oil Capsule	0.2-0.4 ml tid	Smooth muscle relaxer, Reduce gastric motility by acting on calcium channels. (similar to dihydropyridine calcium antagonists)	Beneficial NNT= 2.5 to improve IBS symptoms \$10
Exercise	3-5 times a week, vigorous	Possible increase motility, increase absorption of gas from gut.	NNT=7 for > 50% decrease in pain

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IBS- Bloating	Dose	Mechanism of Action	Benefit/ Cost
Pro biotics	Various doses and concentrations (Difficult to do meta analysis due to lack of standardization)	Repopulated the gut with more efficient bacteria	B. Infantis 35624, Lactobacillus, Streptococcus in combination various most effective in IBS NNT= 4 to prevent worsening global IBS
Pre biotics	Various	Predigested food	Not effective
Rifaximin	550 mg po tid x 14 days (may repeat 2x for recurrent disease)	Presumed decrease in gas producing bacteria	Effective while taking, then diminishes quickly once stopped NNT=11 \$2000] beneficial in IBD-D
Neomycin	500 mg po bid x 14 days /	Presumed decrease in gas producing bacteria	NNT= 4 for improvement in IBS composite score, and NNT=4 for improvement in constipation symptoms. (beneficial in IBD-C)
FODMAPS	See Table Above	Decreases fermentable gas producing foods	following diet improved overall combined symptom score by 50%, increase quality of life, decreased frequency of pain, no change in severity of pain or bloating

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IBS- Complementary Treatment	Dose	Mechanism of Action	Benefit
Cognitive behavioral therapy	weekly- monthly	Help patients come to grips with pain.	NNT = 4 to prevent persistent IBS symptoms
acupuncture	various	Align Chi that is off that is resulting in pain and poor bowel function.	Sham vs real acupuncture = same improvement Acupuncture vs Pharmacologic therapy =Acupuncture therapy (84% vs 63% had improvement in severity score) Acupuncture= to probiotic and psychotherapy.
hypnotherapy	Various	Helping patients better deal with ab pain and lessen pain.	Hypnotherapy superior to doing nothing & standard care for ab pain on IBS symptom score however base on small low quality studies
herbal therapy	Various- several small trials were found looking at traditional Chinese herbal meds as well as and Iraqi traditional medication	Reduce flatulence and ab pain	Studies generally were favorable for improvement in overall symptoms score, decreased ab pain and decrease flatulence. However small studies with low methodic quality.
Homeopathic	asafoetida		68 vs 52% (placebo) of patients had benefit measure on global symptom scale. (3 RCT's low quality, small benefit in favor)
exercise (see above)			

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