The Challenge of Functional Gastrointestinal Disorders in Pediatrics
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Disclosure - Financial

I have nothing to disclose

Disclosure - Off-label use of medications

I will discuss off-label use of certain medications in the management of functional GI disorders in children
Learning Objectives

At the conclusion of this presentation attendees will be able to:

1. Define functional disorders in pediatric GI.
2. Identify diagnostic criteria for a variety of functional GI disorders.
3. Name at least 3 management options for pediatric GI disorders.

What is a “functional” disorder?

- Difficult to explain to patients and families
  - Not an infection
  - Not cancer
  - Not an obstruction
  - Not inflamed
  - No need for surgery
- Symptoms (pain, bloating, nausea, vomiting, burning, etc.) are real, not just “in the head”
- Ability to function normally (school, work, social interactions) is impaired
- Tests are normal

Functional disorders - examples

- Non-cardiac chest pain (and not GERD)
- Interstitial cystitis
- Chronic fatigue syndrome
- Myofascial pain syndrome/fibromyalgia
- Irritable bowel syndrome
- Interstitial cystitis (illustrated)
  - Burning, urinary frequency (feels like UTI)
  - Sometimes need to go all the time, other times can hold for hours
  - Normal urinalysis/urine culture/CBC/lytes/X/R/IVP/VCUG/CT/MRI
  - Difficulty with roles in car, dates, school, work. The more you worry, the worse it gets...
Functional symptoms

- We ALL feel some of these, sometimes
- We usually don’t keep running back to the emergency department
- We normally don’t allow them to ruin our lives

- Functional symptoms become DISORDERS when:
  - We are afraid of the symptoms
  - We stop doing what we enjoy doing
  - We stop doing what we need to do (school, work, homework/study)
  - We are effectively disabled/paralyzed by the symptoms (or fear of them)

Common functional GI disorders in pediatrics

- Topics to be covered today:
  - Functional dyspepsia
  - Abdominal migraine, cyclic vomiting syndrome
  - Functional constipation/fecal incontinence
  - Functional abdominal pain/functional abdominal pain syndrome
  - Irritable bowel syndrome

- Other common conditions not covered today:
  - Functional regurgitation (uncomplicated GER of infancy), infant dyschezia, cyclic vomiting, aerophagia, globus, functional nausea

Diagnostic criteria for functional GI disorders

Rome III diagnostic criteria are used for the purpose of this talk

Rome IV has been released in 2016 - will probably become widely adopted over the next few years
Childhood/adolescent functional dyspepsia

Childhood/adolescent functional dyspepsia

ROME III criteria (children/adolescents)

Diagnostic criteria* Must include all of the following:

▶ Persistent or recurrent pain or discomfort centered in the upper abdomen (above the umbilicus)
▶ Not relieved by defecation or associated with the onset of a change in stool frequency or stool form (i.e., not irritable bowel syndrome)
▶ No evidence of an inflammatory, anatomic, metabolic or neoplastic process that explains the subject’s symptoms

* Criteria fulfilled at least once per week for at least 8 months prior to diagnosis

Childhood/adolescent functional dyspepsia

Symptoms epigastric pain/burning/pressure, early satiety, etc., suggest an upper digestive origin

Sounds like an ulcer, smells like an ulcer, looks like an ulcer...but no ulcer

Treatment with antacids and acid reducing medications not effective

Not necessarily associated with nausea, vomiting, heartburn.

Essentially normal upper GI endoscopy (EGD) and biopsy findings (endoscopy often done because medications did not work)

Often known also as "non-ulcer" dyspepsia

Childhood/adolescent functional dyspepsia
Childhood/adolescent functional dyspepsia

- Discomfort appears to be related to sensations from the stomach and duodenum during meals and in the postprandial state.
- Fatty meals cause more early satiety/fullness and bloating.
- Bloating is inversely related to carbohydrate intake (you can keep eating carbohydrates a lot longer before feeling full).

Physical examination
- May be normal.
- Epigastric tenderness possible.

Differential diagnosis
- Helicobacter pylori infection.
- Acid peptic disorder/peptic ulcer disease.
- Celiac disease.
- Allergic/eosinophilic gastrointestinal disorders.
- Gallbladder/biliary disease.

Diagnostic workup
- CBC with differentials.
- Stool Helicobacter pylori antigen (H pylori antibody is less accurate).
- Celiac disease test.
- Abdominal ultrasound if strongly suspecting biliary disease.
- Trial course of acid reducing medications.
- Consider EGD if no response to treatment, and if diagnosis is still uncertain.
Childhood/adolescent functional dyspepsia - treatment

- Acid reducing medications (H2RA, PPI class medications) - limited effectiveness
- If H. pylori test is positive, a course of anti-Helicobacter therapy may be useful
- Prokinetics - not a lot of options available in the U.S.
- Cyproheptadine - useful for delaying satiety, reducing nausea
- Tricyclics (amitriptyline, nortriptyline) - more likely to be effective than acid reducers
- SSRI/SNRIs - probably less effective than tricyclics

Childhood/adolescent abdominal migraine

ROME III criteria (children/adolescents)

Diagnostic criteria* Must include all of the following:
- Paroxysmal episodes of intense, acute periumbilical pain that lasts for 1 hour or more
- Intervening periods of usual health lasting weeks to months
- The pain interferes with normal activities
- The pain is associated with 2 of the following: anorexia, nausea, vomiting, headache, photophobia, pallor
- No evidence of an inflammatory, anatomic, metabolic, or neoplastic process considered that explains the subject’s symptoms

* Criteria fulfilled two or more times in the preceding 12 months
Childhood/adolescent abdominal migraine

Common observations:
- Onset of attack is often nighttime to early morning
- Affected individuals are completely asymptomatic between attacks
- Headache is less common in young children, becoming more frequent with age
- May have migraine-like triggers (trip to Disneyland, pizza party)
- Family history of migraine is common
- “Sleeping it off” at the end of the attack

Examination findings - usually normal

Differential diagnosis
- Anatomical - malrotation with intermittent midgut volvulus, postsurgical adhesions
- Metabolic - mitochondrial enzyme defect
- Upper GI series is necessary to rule out malrotation

Treatment

Abortive therapy
- Triptans (sumatriptan, rizatriptan) for older children
- Ondansetron if nausea and vomiting

Preventive therapy
- Cyproheptadine (use in younger children - may lose effectiveness)
- Amitriptyline (low dose, may be more effective over 7 years age)
- Propranolol (side effects are often unacceptable for parents)
Childhood/adolescent cyclic vomiting syndrome

ROM III criteria (children/adolescents)
Diagnostic criteria: Must include both of the following:
- Two or more periods of intense nausea and unremitting vomiting or retching lasting hours to days
- Return to usual state of health lasting weeks to months

The major differences between abdominal migraine and cyclic vomiting syndrome are:
- Vomiting is the major symptom in cyclic vomiting syndrome, while abdominal pain is always present in abdominal migraine
- Cyclic vomiting syndrome attacks are more likely to result in the need for emergent medical care and IV fluid hydration
- Metabolic workup should be done if initial onset of cyclic vomiting attacks is at a very early age (infants and toddlers)

The evaluation and treatment of cyclic vomiting syndrome are otherwise similar to those for abdominal migraine
Childhood/adolescent functional constipation

Infant/toddler functional constipation (up to 4 years of age)

ROME III criteria (children/adolescents)
Diagnostic criteria: Must include one month of at least two of the following in infants up to 4 years of age:
- Two or fewer defecations per week
- At least one episode/week of incontinence after the acquisition of toileting skills
- History of excessive stool retention
- History of painful or hard bowel movements
- Presence of a large fecal mass in the rectum
- History of large diameter stools which may obstruct the toilet
Accompanying symptoms may include irritability, decreased appetite, and/or early satiety. The accompanying symptoms disappear immediately following passage of a large stool.

Childhood/adolescent functional constipation (over 4 years of age)

ROME III criteria (children/adolescents)
Diagnostic criteria* Must include two or more of the following in a child with a developmental age of at least 4 years with insufficient criteria for diagnosis of IBS:
- Two or fewer defecations in the toilet per week
- At least one episode of fecal incontinence per week
- History of retentive posturing or excessive volitional stool retention
- History of painful or hard bowel movements
- Presence of a large fecal mass in the rectum
- History of large diameter stools which may obstruct the toilet

* Criteria fulfilled at least once per week for at least 3 months prior to diagnosis
Childhood/adolescent functional constipation

Age of onset:
- Infancy
  - Introduction of formula, changing formula, introduction of new foods
- Toddler years
  - Introduction of new foods, increased voluntary bowel control, fear of passing stool, stress/anxiety
- Childhood/adolescent
  - Fear of public toilets, stool withholding at school, dietary factors, stress/anxiety

How do we know that this is not Hirschprung’s disease?

- Later onset (i.e., not at birth)
- Ability to pass large, bulky stools without laxatives
- Presence of obvious stooling avoidance/withholding behavior
Childhood/adolescent functional constipation

Stooling avoidance/aversive behavior
- Stiffening of extremities, clenched fists
- Hyperextension of lower extremities
- The poop dance
- Hiding, preferably away from the toilet
- Insisting on wearing diapers to pass stool well after the achievement of bladder control
- Pushing, leaning against the wall on tiptoes
- Et cetera, et cetera, et cetera
- Parents think that the child is “trying so hard” to go

Examination findings
- The examination room stinks (encopresis)
- Abdomen seems bigger than the rest of the body
- Increased bowel gas (most common near the splenic flexure)
- Increased fullness to palpation (left side > right side)
- Palpable mass in lower abdomen
- Lax anal sphincter tone
- Dilated rectum, large amounts of stool (feels like peanut butter or clay)
Childhood/adolescent functional constipation

- Encopresis/fecal incontinence
  - Usually occurs in the background of functional constipation
  - Fecal incontinence without stool retention can also occur - much less common in children (it is also harder to treat)
  - Chronic overfilling and distension of the rectum results in decreased sensation
  - Leaked material is usually soft, like peanut butter
  - Affected children/teens often do not smell themselves, and this leads to awkward situations at home and at school
  - Soiling temporarily improves/resolves after large bowel movements
Childhood/adolescent functional constipation - treatment

Laxatives

Many newer laxatives work via novel mechanisms of action (e.g., as calcium channel agonist, guanylate cyclase-C agonist, mu-opiod receptor antagonist, etc.). Most of these are not FDA approved for use in children.

- Laxatives used in pediatrics usually are either stool softeners or colon stimulants/irritants
- You give some from the front end, and others from the rear end

Stool softening laxatives

- Fruits and vegetables, juices
- A large milkshake (works best if you are lactose intolerant)
- Lactulose, sorbitol
- Fiber products (psyllium, guar gum, methylcellulose, konnyaku)
- Mineral oil
- Docusate sodium
- Milk of magnesia
- Magnesium citrate
- Any other kind of “saline” laxative
- PEG-3350

Thankfully, not too many of us prescribe this anymore...

Barley malt extract (Maltsupex)

- Expensive
  - $80 for an 8 ounce bottle
  - $5 for a recommended children’s dose
- Tastes awful (according to every mother who ever tried it on their children)
Childhood/adolescent functional constipation - treatment

Stool softening laxatives...
- Do not work right away (effect starts proximally, then works toward the bottom) - may take a few days if starting for the first time
- Effect is related to dosage
- Generally safe to use (except for saline laxatives with sodium phosphate or sodium chloride in those with underlying cardiac or renal disease)
- “Natural” ingredients are fermentable and can cause bloating/cramps

Suggestions for using PEG-3350 (MiraLax)
- Standard 17 gram dose is about 20 mL of powder
- Typical daily maintenance dose will be around 5 mL per 20 pounds weight
- Start with higher doses (double or triple) the first few days, then reduce the dosage
- Effect is stronger if it is consumed quickly, in a single dose
- OK to add mineral oil (child should not have aspiration risk)
- May consider eventually transitioning to a soluble fiber product (e.g., Benefiber)

Stimulant laxatives
- Coffee (other unintended consequences may follow...)
- Bisacodyl (Dulcolax)
- Phenolphthalein (Ex-Lax)
- Senna (Senokot, “dieter’s” teas)
- Cascara sagrada
- Glycerin (suppository, enema)
- Castor oil
Childhood/adolescent functional constipation - treatment

Stimulant laxatives
- Senna is used very liberally in Europe
- Worry about laxative dependence may not necessarily be warranted
- Will cause cramps, stomachaches, and possibly nausea
- Probably best not to give at bedtime or before school
- Oral route - effect usually takes a few hours, so children who take these products may not necessarily associate taking the laxatives with the subsequent effects

Childhood/adolescent functional constipation - treatment

Maintenance treatment with stool softeners - duration varies, depending on the child
- Several days to several years
- The longer the problem existed before treatment, the longer the treatment
- Treatment needs to be tapered SLOWLY
- Taper treatment only after the child exhibits no evidence of stooling avoidance behavior, or the problem will return IMMEDIATELY after treatment is stopped

Childhood/adolescent functional constipation - treatment

Diet
- Sorbitol-rich fruits/juices (e.g., pears, canned fruit cocktail) are natural laxatives
- Encourage eating plenty of vegetables and whole grains
- BUT don’t overdo fiber if the child is still having a lot of avoidance behavior - fiber increases stool bulk, so there will be more stuff that will eventually need to come out...
- A healthy, balanced diet is always a safe bet
Childhood/adolescent functional constipation - treatment

Behavior
- Encourage toilet sitting after meals
- If using the toilet is too traumatic, at least "do it" near the toilet (not in the opposite corner of the house)
- If not wearing diapers when pooping is too scary, then sit on the potty with diapers on
- Reward for progress, even if baby steps
- Communicate with teachers, caretakers

Childhood/adolescent functional abdominal pain

ROME III criteria (children/adolescents)
Diagnostic criteria* Must include all of the following:
- Episodic or continuous abdominal pain
- Insufficient criteria for other FGIDs
- No evidence of an inflammatory, anatomic, metabolic, or neoplastic process that explains the subject’s symptoms

* Criteria fulfilled at least once per week for at least 2 months prior to diagnosis
Childhood/adolescent functional abdominal pain

- **Pain**
  - Usually periumbilical, but may be slightly above the umbilicus, lower abdomen, off to one side
  - If not pointing to the umbilicus, usually not very precisely localized
  - Usually does not radiate up the chest or radiate to flanks, shoulders, back
  - Feels like “cramping”, “sharp”, “stabbing”, “punched”, “bloated”
  - Crying, screaming, moaning, doubled over, rolling around, hyperventilation, high drama
  - Often worse in the mornings, close to bedtime, school days (especially Mondays)

- **Pathophysiology** - increased, excessive, inappropriate visceral sensations of colon distention and contractions
  - Rectal distention test (rarely done in children!)
    - Affected individuals experience pain at lower balloon volumes
    - Pain is poorly localized and usually periumbilical
    - Fatty meals increase sensitivity to pain

- **Common associated symptoms**
  - Nausea (but usually not vomiting)
  - Bloating
  - Abnormal bowel movements
  - Flatulence (another common excuse)
  - What about them Flamin’ Hot Cheetos and Takis?
    - Job security for pediatric gastroenterologists
    - I don’t know what they do in the intestines, but I know that they stimulate pain fibers, and they can set kids’ rear ends on fire (why some teens “butt-chug” Tabasco sauce for fun requires explanation beyond the realm of conventional logic)
Childhood/adolescent functional abdominal pain

- Clues in the history
  - No vomiting
  - No documented, real fever
  - No bloody stools
  - Medicine for gastritis, ulcers, GERD tried and did not work
  - Sleeps OK once the child manages to fall asleep
  - Worse on school days
  - Weight trend not suggestive of serious illness (e.g., fat kid getting fatter as stomachache is getting worse and child won’t go to school)
- Psychosocial stressors
  - Parental separation/divorce
  - Bullying, problems with specific classes/teachers
  - Parental job loss
  - Serious illness/death in the family, friends (“so and so had the same kind of stomachache...and died...”); worried about cancer
  - Boyfriends, girlfriends, gender identity crisis, sex, drugs, alcohol

Childhood/adolescent functional abdominal pain syndrome

- Examination findings:
  - Can be completely normal
  - Signs of anxiety in the room (hopefully only from the patient/parent and not from the clinician)
  - Active bowel sounds, gassy abdomen, stool masses in the lower abdomen or left side
  - Tenderness can be above the umbilicus, but should not be right under the ribs
  - No Murphy sign
Childhood/adolescent functional abdominal pain syndrome

Same as functional abdominal pain, but with DISABILITY...

- In school-age patients, this usually means not going to school
- Repeated visits to the clinic, urgent care, emergency department, operating room...
- Some of these patients will end up losing their appendices or gallbladders, and a few will lose both
  ...and often additional symptoms, e.g., headache, limb-pain, etc.

Childhood/adolescent irritable bowel syndrome

ROME III criteria (children/adolescents)

Diagnostic criteria* Must include both of the following:

- Abdominal discomfort** or pain associated with two or more of the following at least 3 of the time:
  - a. Improvement with defecation
  - b. Onset associated with a change in frequency of stool
  - c. Onset associated with a change in form (appearance) of stool.
- No evidence of an inflammatory, anatomic, metabolic, or neoplastic process that explains the subject’s symptoms

* Criteria fulfilled at least once per week for at least 3 months prior to diagnosis
** "Discomfort" means an uncomfortable sensation not described as pain.
Childhood/adolescent irritable bowel syndrome

What is IBS?
A paraphrased version of the diagnostic criteria

- Otherwise healthy, young person
- Lots of stomachaches (the crampy, spasm-like, bloated kind)
- Not pooping normally (or complaining of not pooping normally)
- Feels better after a good bowel movement
- More bothered by the pain than the poop
- ...for 2 months or more (3 months for adults)

Childhood/adolescent irritable bowel syndrome

3 types of irritable bowel syndrome

- Constipation-predominant type
- Diarrhea-predominant type
- Alternating between constipation and diarrhea

Childhood/adolescent FAP/FAPS, IBS
Differential diagnosis

- Specific food intolerance/allergy
- Celiac disease (probability is about 0.7% in the U.S.)
- Gastroenteritis, infections, mesenteric adhesions
- Biliary/gallbladder disease
- Pancreatitis
- Inflammatory bowel disease
- Ischemic bowel
- Neuromuscular pain (abdominal cutaneous nerve entrapment syndrome)
- Familial Mediterranean fever, porphyria
- Malignancy

If not functional abdominal pain, there are usually findings in the history, examination or laboratory/radiographic studies that will reveal clues.
Childhood/adolescent FAP/FAPS, IBS
Diagnostic “red flags”

- Localized tenderness far from the umbilicus
- Recurrent vomiting, hematemesis, bilious emesis
- Bloody stools (especially with diarrhea)
- Peritoneal signs
- High fever
- Unexplained weight loss
- Jaundice, petechiae, ecchymoses, purpura
- Edema, joint swelling/deformity
- Frequent nighttime awakenings due to pain or defecatory urge

Childhood/adolescent FAP/FAPS, IBS
Diagnostic studies

Helpful for ruling out OTHER conditions:

- CBC with differentials, ESR, CRP
- ALT, direct bilirubin, lipase, creatinine
- Celiac disease antibodies, stool Helicobacter pylori antigen
- Ova and parasites, urinalysis, pregnancy test
- Specific food RAST IgE

KUB - sometimes more useful for showing the patient and family than for any diagnostic purpose

Childhood/adolescent FAP/FAPS, IBS
Diagnostic studies

A few notes about endoscopies:

- The most common indication for colonoscopy in pediatrics is rectal bleeding
- Internal hemorrhoids, polyps - usually painless bleeding
- Celiac disease or inflammatory bowel disease - may be associated with increased bowel frequency, abdominal pain, tenesmus, diarrhea

- Endoscopies are rarely indicated in pediatric patients with functional lower GI symptoms (therefore...please do not give the families expectations that the kids are getting scoped)
Childhood/adolescent FAP/FAPS, IBS Treatment - diet

- Fatty foods - increase sigmoid colon spasms and sensitivity to rectal distension
- Lactose/dairy products - causes bloating, cramps/pain and diarrhea for those who are lactose intolerant
- Gas-forming foods (e.g., cauliflower, peas, beans, too much fiber)
- Fruits and juices that are laxatives (apples, pears, stone fruits, watermelon, etc.)
Childhood/adolescent FAP/FAPS, IBS
Treatment - diet

Lactase intolerance
- Most common in Asian and African ethnicities
- Onset is usually during late childhood to early adulthood
- Onset is gradual/insidious (over months/years)
- Symptom progression - first bloating, then cramps/pain, then diarrhea
- Not a disease by itself
- Lactase-free milk/dairy alternatives are becoming commonplace
- Lactase enzyme supplements - dosage depends on the amount of dairy products consumed, needs to be taken with the dairy product
- Symptoms are very similar to IBS - diarrhea predominant type

Low-FODMAP diet
- F - fermentable
- O - oligosaccharides
- D - disaccharides
- M - monosaccharides
- A - and
- P - polyols

Low-FODMAP foods - banana, orange, grape, carrot, zucchini, rice, etc.
High-FODMAP foods - peaches, pear, avocado, beans, sodas, etc.

Childhood/adolescent FAP/FAPS, IBS
Treatment - toilet use

- Attention to posture - remember that toilet seats did not exist for most of human history...we were designed to do it squatting...
- Using a small stool, inverted bucket, shoebox, etc., to raise the feet when sitting on the potty also helps
- Don’t make small kids use adult toilets
- Toilet avoidance at school is a major problem
Childhood/adolescent FAP/FAPS, IBS
Treatment - toilet use

A “pretty please potty letter” from the child’s medical provider may make a big difference for the...

...easily grossed out kid (access to use toilet at the nurse’s office, if one is available)
...easily embarrassed kid (access during times other than recess and lunch)
...the kid who would otherwise avoid going to school because of stomachaches

Childhood/adolescent FAP/FAPS, IBS
Treatment - menthol and minty stuff

Menthol, the active ingredient in peppermint oil, has analgesic properties (used in cigarette filters, arthritis ointments, etc.)

- Peppermint tea (hierba buena)
- Strong mints
- Enterically coated peppermint oil capsules
- Judicious topical use of menthol-containing preparations for older kids

Childhood/adolescent FAP/FAPS, IBS
Treatment - abdominal breathing

- Taught in Lamaze class, yoga, tai-chi, playing musical instruments, singing
- “In through the nose, out through the mouth”
- Deep, relaxing breath by moving the diaphragm (causing the belly to rise and fall), and with minimal chest movements
- We do it all the time...sigh of relief (“Phew, that was close!”)
- Best example - Mr. Miyagi from “The Karate Kid”
Childhood/adolescent FAP/FAPS, IBS Treatment - medications

- Stool softeners
  - Fiber products (psyllium, guar gum, methylcellulose)
  - PEG-3350
  - Magnesium hydroxide (MOM)
- Antidiarrheal
  - Diphenoxylate
  - Fiber (soluble fiber absorbs water)
  - Cholestyramine (treatment of bile salt diarrhea)

- Spasmolytics (anticholinergic side effects common)
  - Dicyclomine
  - Hyoscynamine
- Antibiotics (for bacterial overgrowth)
  - Metronidazole
  - Rifaximin
- Probiotics (individual responses vary)

Unfortunately, this only works if the provider himself/herself is sure that the patient has a functional disorder.

- Any anxiety or uncertainty that the provider has will be betrayed by his/her speech cadence, intonation, eye movements, body language.
- Conduct most of the visit sitting down, even if you are in a hurry.

If you don’t do this well, you will end up ordering more labs/tests and end up spending even more time with the patient/family.
Childhood/adolescent FAP/FAPS, IBS Treatment - the biopsychosocial model

- **Biological** - the pain is due to sensations of pressure and contractions in the intestine
- **Psychological** - anxiety, worry, fear, stress, depression
- **Social** - school situation, parental marital problem, new school, adjustments, secondary gains

Childhood/adolescent FAP/FAPS, IBS Treatment - cognitive behavior therapy

- **Before:** “I have a bad stomachache. I cannot go to school because of the stomachache. I can’t do anything because it will make the stomachache worse. If I tell people I have a stomachache, they will be nice to me, and my teacher won’t give me homework…”
- **After:** “I have a bad stomachache. My doctor said that he is sure that everything is ok, and he did tests just to make sure, and they were normal. I know that I will be ok because I learned several things that will help to make me feel better. I will try relaxation techniques, and I notice that it doesn’t hurt as much when I’m busy doing something else…”

Childhood/adolescent FAP/FAPS, IBS Treatment - cognitive behavior therapy

- The goal is not to cure the problem
- The goal is to make the problem manageable

“Cognitive behavioral therapy (CBT) is a 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.”

Childhood/adolescent FAP/FAPS, IBS
Treatment - When all else fails...

Focus on nerves, receptors, brain chemistry (all off-label use)...
- Tricyclics (amitriptyline, nortriptyline)
- SSRI* (fluoxetine, sertraline, etc.)
- SNRI* (venlafaxine, duloxetine**)
- Anticonvulsants (gabapentin)

*SSRI and SNRI - increased suicide risk in teens
**Duloxetine (Cymbalta) has pain reducing effects independent of effects on depression and anxiety

Stuff that’s too hot for even a pediatric gastroenterologist to handle:

Referral to an integrated pediatric pain management program
Services involved at such a program at UCLA
- Medical evaluation
- Individual psychotherapy, family therapy, counseling
- Hypnotherapy, biofeedback training
- Massage therapy, cranio sacral therapy, art therapy
- Acupuncture, Chinese herbs, iyengar yoga