The Curbsiders: Internal Medicine Podcast
Episode 267: "Diarrhea Disemboweled, Part 2: Chronic Diarrhea"
Audio Transcription

0:54
So she is a 43 year old female. She has a history of hypothyroidism. She's on levothyroxine, she also has a history of type one diabetes. She's had it since she was about 15. And she's coming to you with a three month history of non bloody diarrhea. She describes three to four loose bowel movements daily. She describes them as sticky, and she says they're painless. So thinking through how to work up chronic diarrhea. How would you categorize the etiology of chronic diarrhea?

3:28
So I want to make just one quick note about acute diarrhea, right? chronic diarrhea has to start somewhere. So when you're working up your acute diarrhea, you always have to keep in mind all the etiologies of chronic diarrhea in case it doesn't stop. There, just just kind of, you know, like, you can't really separate that. So chronic diarrhea, you've seen a lot of algorithms, you know, osmotic versus secretory, inflammatory versus non inflammatory, motility, absorption, whatever, it kind of doesn't matter. Like it matters in an academic sense, when you really need to categorize it. And it's almost like, it's great for a board exam, it's but sometimes it's not necessary to really say, oh, man, this is really osmotic or secretory because there's so much overlap. And it's actually so complex that usually these etiologies span the categories. And so I like to think about, is it osmotic or not, because osmotic diarrhea is actually quite clear. And then it just kind of becomes a little bit messy when you start talking about secretary or inflammatory because he do the same thing. So thinking about osmotic diarrhea, right, you kind of want to think about is there an osmotic gap or not? And we do want to talk about that. Now. Talk about that later.

4:45
Yeah. How are you going to tell if there is a gap or not?

4:48
Yeah, so let's talk about the stool osmotic gap. So this is where the these stool tests sometimes do come in handy. But the first questions Always ask your patient when you're evaluating for chronic diarrhea to kind of make that differentiation is what happens when you stop eating. If the diarrhea resolves in when they're fasting, it's something they're eating, right, it's osmotic, it's something that they are ingesting that is inducing that diarrhea, because otherwise it shouldn't go away. You can kind of think about the functional diarrhea is like that as well. But even like

IBS will not go away. If they're fasting, it might get worse if they eat, but it won't go away. So a true osmotic diarrhea resolves with fasting. So that's the first question, I'm going to ask them. And then if I'm going to work it up, then you send the stool Osm test, which is really just stool electrolytes, right? we very rarely actually send stool osmolality. And I don't know if you want me to get into why it's just not an accurate test. Because in order for it to be accurate, you have to literally take that stool and get it to the lab, ASAP, before any of the stool bacteria have any chance of fermenting anything.

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And as we know, the stool sits in refrigerator for two days for the bringing in.

6:06
Exactly, exactly. And even an inpatient setting like who's gonna transport that stool fast enough before bacteria get at it? Right. Like you just it's not necessary, unless the only indication would be if you're considering factitious diarrhea, which I think we should just not get into. So the stool awesome gap. And this is really important to understand only because every board question like every board exam, like asks you about the stool osmotic gap. So the the way that I've been taught this is is the function of the Val from the duodenum to the colon is to maintain an osmolality that of serum. Okay, so the goal of your GI tract in absorbing water is to make sure that your stool osms equals your serum's osms. And so when you're looking for that, so your serum osmolality, is going to be 290. And so if your stool osms measurable kind of things that are supposed to be in school, the sodium, the potassium and the anodes that go with that do not add up to close enough to 290, then there's some unmeasured component that's making that up. And there's some nice charts to like, visualize this. Because it took me forever to like kind of wrap my mind around this, but just remember there's something else in the stool that's on a measured and that's your whatever's causing your osmotic diarrhea. Sorry, I got I got kind of sidetracked, but categorizing chronic diarrhea. So then if it's not osmotic, right, it's usually some sort of secretory diarrhea that, so if there's not an unmeasured osms, then there's too much of your measurable osms, and then water goes along with those. And then the question is, what is secreting? Is it an infectious etiology that's triggering more secretion or decreasing your absorptive capacity? Is it inflammation? Because inflammatory diarrhea is actually a secretory diarrhea, right? It's because you cannot absorb? Is it blood? Is it? Is it that in the stool that is preventing you from absorbing is it bile acids, which is going to be kind of important, much more important than our workup of chronic diarrhea? Yeah. And then, once you kind of think about that, then you wonder about, is there a motility issue? Right, is the stool just moving too quickly? And so that's why there's not enough absorption happening. And then lastly, you get to this IBS or functional diarrhea where all of the testing you're able to do as normal, but they meet this Rome four criteria for a functional disorder, or now we call it disorders that the gut brain axis. I don't know if you if you knew it, we change the name on that one. But they are no longer functional gi disorders.

8:51
Oh, they're really disorders of the gut brain axis. Yep. Is there an acronym for that?

9:00
It's like the BGA which really just flows off the tongue as well as FGI did.

9:10
okay, with the so with this stool, osmotic gap, so we're doing essentially the formula, it's what 290 minus two times sodium plus potassium, and it's just this it's a random sample, like they just poo in a cup bringing it in, and you you check the sodium potassium, and, and that's it.

9:33
Yeah, not a cup. It's in a toilet hat.

9:35
It's in a toilet hat.

9:36
Yeah, yeah. And sometimes it's freeze dried, so that it just maintains freshness. I was gonna say something. Oh, man, totally lost.

9:44
I'm sorry. What? No,

9:45
no. Oh, the so osm gap. So less than 50. Right. If the gap is less than 50, that's within normal. And so that's considered a secretary diarrhea, if it's greater than 100. There's some sort of unmeasured osm, okay. And

9:57
what would the unmeasured osms be?

10:01
Yeah. So so then then we go down our differential of what causes osmotic diarrhea, which is great. Um, often you think about kind of surreptitious or accidental. I don't want to say surreptitious, right, because that kind of implies that the patient's doing it on purpose. But really often it's accidental ingestion of laxatives, particularly magnesium based laxatives, which tend to be in like a lot of natural supplements. So like that calm all to help sleep is magnesium based, so a lot of people use it to sleep and then it gives them diarrhea. The other things can be like unmeasured anions even like phosphorus right? Well, we use phosphorus a lot in our preps in our colon, perhaps because they're on absorb the other thing to go along. So if you do have that osmotic gap, this is when you might want to think about measuring a stool pH. Because if the if there's unmeasured ohsms in the stool, pH is less than six, it actually indicates that there's some sort of carbohydrate malabsorption that's contributing to your unmeasured osms. The reason that pH gets low is because that carbohydrate ends up in your colon when it's unmeasured, and then the bacteria ferment it, and that drives down your stool pH. So that's kind of where that stool pH fits in on the algorithm. The other sorry, other unmeasured osms to

consider are the sugar alcohols that a lot of our patients consume. And so when we walk into a room, consulting on a patient with diarrhea, and they have a bag of like hard candy sitting there, but usually there's some sort of like sugar alcohol in there that's precipitating or perpetuating whatever diarrhea they had to begin with.

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It's helpful. Do you guys remember those? It's like gummy bear row. Yeah,

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The sugarfree gummy bear that was like a that was a prank going around for a little while.

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We have I have to tell the story. We have this consultant when I was a fellow who taught us the like, the goal of the the GI tract is to maintain the osmolarity that of serum. When he gives that talk he hands out gummy bears like sugarfree gummy worms at the beginning of the talk and make sure that like everybody takes one and then he tells us all like what happened because he gave us all this fruit.

12:31
So fructose is actually Oh my god, sorry, you might need to cut this out. I'm going to nerd out a little bit. Most good. So glucose is transported and are single sugars are transported across the brush border by these glut transporters. Right. So most of them are facilitative transporters. fructose is a diffusion transporter. And so fructose, when you give it with glucose can be facilitated. But fructose in excess of glucose needs to go through its own transporter, and that is only diffusion capacity. And so you can overwhelm that transporter. And so if you eat enough fructose in excess of glucose, you get diarrhea. Because of the fructose, even though you can't absorb it. .

13:15
Can I can I ask about? So so we're talking about? I have some questions. I definitely want to talk about fodmap. And I want to talk about BRAT diet. Like I want to talk about some of the like the dietary things that go along with this. Maybe now's the time, maybe not because, you know you're talking about fructose. I'm not sure if that's why apple juice, I find it funny that apple juice is always listed as like a bad offender. But then it's also part of the BRAT diet, which is like what you tell people to eat? Or what would that's like the kind of like the thing that like, my mom would be like, Oh, yeah, you got to eat a BRAT diet when you have diarrhea, bread, rice, apples and toasts. But that doesn't really seem to make sense. Because if you look at the fodmap stuff, those don't don't really mesh together.

14:00
Have a lot of thoughts about the fodmap. They're kind of like polarizing thoughts. But I did write paper about it. So somewhere a peer review process has validated these has validated your thoughts.

14:13
Oh, cuz we love fodmap I love fodmap. But yeah, I don't know that much about it. So tell me, tell us.

14:20
Really, okay, we're gonna we're gonna open this can of worms. Okay, so So what is the fodmap diet? So the theory behind the fodmap diet is that these are poorly absorbed fermentable products that we ingest that because they are poorly absorbed or poorly digested by our human system, they become fodder for bacteria to digest and when bacteria digest them, they produce gas they produce unmeasurable osms, and they can cause symptoms in something like irritable bowel syndrome. And so, one thing I will say that is indisputable about the low fodmap diet is one it's the low fodmap diet and two, it is not Like the gluten free diet, you are not supposed to follow this diet for life. And this is something that our patients often do not get hold about, because it is very restrictive. And so you do risk micronutrient deficiencies. So the way you're supposed to follow the low fodmap diet is a six week course of elimination, and you must reintroduce, so you kind of get rid of your symptoms, and then you add back foods that you can tolerate, because otherwise you're just left eating nothing, right? Not nothing, not not nothing, but but it is very limiting. So, so that message needs to be very clear, right, the low fodmap diet is a temporary diet that needs to be rebuilt. Now, when you go back to the theory of the low fodmap diet, though, it's that these things are on absorbed or non or always fermented, right. And that's not true of every item on the low fodmap list. So there are certain items that we definitely like nobody has the enzyme capacity to digest. And those are the fructans and the galectans in that group, as well as the polyols. The polyols, the sugar, alcohols, sorbitol, xylitol, manitol, I believe is in there as well. And so we cannot those are always unmeasured osms, we cannot digest period, the fructans have a lot of information in the press because they might be the actual etiology behind non celiac wheat sensitivity because fructans are in wheat products. So those we don't have the enzymes to absorb, always fermented by bacteria. galactans are in things like lentils. And so that's why like beans cause a lot of gas for a lot of people because nobody can digest them. But everything else. lactose is very dependent on your own personal ability to digest lactose, right, in some certain like is ethnicities, like in East Asian populations, like 94% of folks are lactose intolerant, because we just lose that enzyme. But that's not the case for like Scandinavian folks, they hold on to their lactase for life. And so there's no reason really to eliminate lactose from their diet. So you really have to be, you know, kind of specific about that. And then the other two in there, the fructose, which we kind of talked about, right, it's really frutose in excess of glucose that's going to be unabsorbed, and if you look at how much you have to eat, to really get fructose in excess of glucose, it's a lot like you're sitting there chugging apple juice, in which case, yeah, you're probably gonna get some diarrhea. And the other one is going to be sore sorbitol and sorbitol is also something that you have to really overwhelm your body's capacity to absorb. And it's, your body can do pretty well, unless you're very, very sensitive. And so my overall non biased thoughts are going to be one to limit the duration of your low fodmap diet because it can work and to to do it with a dietitian, who can really go through it and one, that's how the studies were validated. And two, you really want someone to pay attention to what your patients are and aren't doing, and make sure that they're following that diet to the and utilizing it to the best of their capacity.

18:17
So when you when you have somebody with a chronic diarrhea, you said, Yeah, there's there's this huge differential diagnosis that you can go through what practical things do you tell them that help you either figure out what's the cause? Or that just help you get them through this that help help make it better?

20:41
Yeah, let's go through it more of like an algorithmic approach for clinicians. So one is going to be that osmotic separation is easy. And so I do that first, does it get better if you stop eating? And then I'm going to go for the red flags. So is there blood in your stool? Are you losing weight? And here right, because now we're talking chronicity, that weight loss is going to be a really key component. It because now malignancy comes into the picture. And then I'm going to ask about surgical history, because different surgeries will put you at risk for different types of diarrhea. And then here, even more than an acute syndrome, you really want to do a thorough medication history. So in MS Stila, for example, she's hypothyroid on levothyroxine. Is she overdosing on her levothyroxine? Is she getting too much replacement, right, which would potentially speed up her bowels? She's type one diabetes. Now, she probably isn't on Metformin. But did someone put her on Metformin for a little bit just to try it out? Right? Because that that can really induce diarrhea as well. other medications that we need to consider are really the SSRIs are big offenders in terms of causing diarrhea. So needs to be kind of considered in the differential?

21:54
Can I ask you a stool history question? I feel like you're the person who has I feel like you'd be excited about this. Yeah, for sure. Floating store? Oh, like it's sort of presented very commonly. What am I to do with that? Is that not really helpful detail?

22:11
So the floating stool is often taught as an indication of that. But it's actually an indication of gas. So it doesn't really tell you anything, except that your float your stools have like more volumes of density and so float. Like it just it just there's more gas in your schools. What you really actually want to ask, right, because you're asking about fatty diarrhea is, are your stools greasy? Are they difficult to flush? Like, are you flushing multiple times and seeing like streaks on the toilet bowl, so those are more indicative. And really the only true and indication of fatty malabsorption? is when you see oil droplets in the stool?

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I was gonna ask about like the oily residue on top.

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they tell me that all believe that they're not absorbing fat for all the other ones like you kind of wonder like, Yeah, but loating stools. Just think, okay, maybe don't ignore it. But it's not, it's not a reason to give anybody kreon

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just not move on. Right. Got it. Yeah.

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And then what about for functional diarrhea? I know that there's fairly specific criteria, how do you ask about those?

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So you want to so one is going to be to rule out those red flags, right? those risk factors, make sure those are not present. And then in your patient who's otherwise young, healthy, and there's a sorry, I'm kind of losing my words how to phrase this because to me, I get a sense of when it's about to be functional. But that is not helpful to anyone else.

24:10
What workup might these people go through? You know, before we start to, like practically you mentioned we might tell them to fast right? We maybe will tell them to take cut out lactose for a week. We talked in the past about the skim milk test where if they can tolerate skim milk, but not whole milk, then it's the fat that's the problem for them.

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Let's kind of we'll take a more guideline based approach. Okay, so the American gastro society has these guidelines for how to work with functional diarrhea, which I think is a good place to start instead of kind of what I talked about before. There are only a few tests that are recommended in the workup of functional diarrhea to make sure that there's nothing else going on in the absence of these risk factors. Okay. So one is going to be to look at, you know, infection testing of those organisms we talked about earlier that could potentially cause a chronic diarrhea. Giardia, c. diff., right, those are going to be the big ones there. Celiac testing is actually a strong recommendation. And we haven't really talked too much about celiac disease. But celiac disease causes diarrhea from a number of from a variety of factors, but most is going to be that loss of absorptive surface. And so with TTG, IgA would be the recommended initial screen because it is non invasive. And then you do a total IgA along with that to make sure you're not missing celiac. And then the guidelines do recommend doing fecal calprotectin or lactoferrin testing to rule out your inflammatory causes of diarrhea, and that's going to be specific to colon inflammation. So you're really pulling out all sort of colitis. And I specifically say that because you cannot fully rule out Crohn's disease, because Crohn's disease doesn't sometimes does not impact the colon at all. And so it can actually have a negative fecal calprotectin. But if there is signs of Crohn's disease, you may, you may find other signs and symptoms like obstructive symptoms, for example, if there's weight loss, there's bloody stools, you're having a small bowel source of diarrhea, and you're you have high suspicion for IBD. That's when I would do imaging of the small bowel to make sure I've ruled out Crohn's disease, that that's outside the functional testing, though, but just the caveat to remember for an IBD workup, talking about these like fecal calprotectin, and lactoferrin, they are better than CRP, for an evaluation of colitis. So the CRP only has a sensitivity of less around 50%, and a 73% specificity for IBD. Whereas a fecal calprotectin has a 92% sensitivity and an 82% specificity. So

it does much better. And it is actually a really good test for differentiating IBD, from IBS. And when we kind of get into I guess this is probably outside the scope. But for a lot of our patients who have IBD, but who are in remission, but still have diarrhea, then that becomes really important for us to hone down what is this IBD that's flaring, or is this IBS on top of IBD, which is actually quite common. The third test that has recently come out, so this one was added in the 2019 apa guidelines for workup of functional diarrhea. But is, is a was a little controversial, because this testing is not widely available, is going to be for fecal bile acid testing. So bile acid malabsorption, we carry or we classically think about for folks who have undergone cholecystectomy, or have some sort of absorptive issue, like ilio, Crohn's disease, where they're not reabsorbing their bile acids. So then these bile acids go into the colon, and they actually cause a secretory diarrhea, because they're irritating. The bile acid test is the gold standard is available here is going to be a 48 hour stool collection. And we often do that with a with a fat collection, so that you just collect all stool all at once. And then you quantitate the total bile acids and the percentage of primary, probably more than we need to talk about. But basically, it's a stool collection or a very specialized kind of new testing that that's still in development. But it's it's reasonable to think about it because you could potentially just empirically treat it with another bile acid binder. So it's something important to think about.

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Are you saying like for certain patients with a fever, like maybe this is a functional diarrhea, maybe it could be related to bile acids, making it where they aren't supposed to, they're not being reabsorbed. And so they're making it further than they're supposed to and causing diarrhea, you just give them an empiric trial, cholestyrene And hope it goes? Well, you'd have to tell her about her leave with thyroxin to space it out. You know, that's always the worry. I think for me with those agents, the patient's always on something else that I'm worried about now absorbing now, because we're binding the cholestyrene.

29:09
And that's the reason the guidelines recommend the testing. Because if you don't have it, and you just treat them for IBS, they don't respond very well. And so you then you're risking putting their other medications in jeopardy for something that potentially won't work. So it's for these binders. One, they taste really bad, too, they're dosed very frequently. And then three, they have all these medication interactions, so it is better to make sure you have that diagnosis. However, if your clinical suspicion is high, for example, they have that causes they have had cholecystectomy, and then immediately they had diarrhea, or they've undergone bowel resection, and we can maybe talk about kind of the length of bowel resection where it matters. But if they've had less than 100 centimeters of bowel resected, and they're having diarrhea, then it's high likelihood that they're not absorbing bile acids because their resorptive capacity is gone, and so in those patients and you don't have the testing available, it's reasonable to do an empiric trial.

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Do you mean if they, if they have, can you talk about the bowel one more time, what was the number there the cut off it was if they have more than or less than 100 centimeters.

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So this is the cutoff for small bowel resection. If you have less than 100 centimeters of small bowel resected, okay, you lose bile acids, but you don't lose so much that your liver can't make up for it. So what happens is your liver ends up over producing the bile acids. And so the excess gets into the colon. Okay, it's important to make this differentiation because when you have more than 100 centimeters of bowel resected, your liver is no longer able to keep up with that capacity. So you lose so much bile acid that you actually end up with a fat malabsorption. Because now you can't you're losing that bile acid binding capacity, and you don't have enough to absorb your fat. And this is important because those patients will have fat malabsorption. And if you try to give those patients a bile acid binder, their diarrhea is going to get exponentially worse because now you're getting you're taking away like what little bile acids they had to bind up that. And so that 100 centimeter cut off comes up on gi boards a lot because of that distinction, because you really don't want to give them the wrong medication there.

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I completely misunderstood that, too.

31:28
I think I missed that question.

31:31
Elena would so tell us let's get back to Ms. Stilla Watery, what is happening with her?

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So she is ready to describe her diarrhea. She has some fecal urgency, she doesn't have any incontinence. She has no abdominal pain, or new medications. And really her histories also pertinent for about 10 pounds of unintentional weight loss in the last six months, and she did have a cholecystectomy, but that was three years prior, and so we've kind of talked about most of the stool testing that I think would go along with her evaluation so the osmotic gap, working up celiac disease, if that was a concern, sending a fecal calprotectin or lactoferrin bile acid testing. I guess one other area would be any other tests that you would send or I know you just mentioned fecal fat, so how would that be evaluated?

32:27
So the one other test that I think it's worth mentioning is testing for SIBO, or small intestinal bacterial overgrowth. Because we often hear about this in the context of like a naturopathic physician who told their patient that they had bacterial overgrowth. And I know, kind of I didn't hear very much about this diagnosis, but it is a true diagnosis. And there are certain patients who are at higher risk for bacterial overgrowth in their bowels. And the bacteria in their small bowel can end up fermenting a lot of products that would otherwise be absorbed and end up causing unmeasured osms, and bloating and diarrhea. So the way you would test for that would be with a breath test, or the gold standard would be endoscopy, which we can talk about later. And we can talk a little bit about the risk factors or we can put a put a pin in it for now, going

back to the fecal fat, so actually a spot fecal fat is is pretty decent. So you can do a spot fat with a Sudan stain, and that's got a sensitivity of 76% and a specificity of 99% for fat being there. And if you have a lab that can actually count the fat and measure the fat globules, you're getting up to like 94%, sensitivity 95% specificity, and it's got really good correlation to a quantitative fecal fat, the benefit of that quantitative fat is then you can actually weigh the store. So that's where that like initial definition of diarrhea becomes comes into play. Right? This is the only time you would wait the stool, and you actually prove whether or not your patient is having diarrhea or not. And in a lot of our functional gi patients, it feels like they're going a lot but their fecal weight is actually not that much. Okay, so that's one one reason to do it. Caveat about measuring fecal fat is that you have to remember that what like we talked about that pathophysiology, right, speed and motility and like absorption time matter. So if you have diarrhea because of a rapid transit from some other etiology, you're going to validate that. So just because you have fat in your stool doesn't mean that the fat was the driver of your diarrhea unless you quantitate that fat. And so they've done studies, and in normal healthy individuals, if you give them laxatives, 35% of them will actually meet criteria for mild steatoreah based on fecal fat testing. And so you really want to kind of use that stool weight and if that stool weight is really high, then you're cut off for what is a fatty diarrhea and steatorrhea needs to go up, but that upper cut off is going to be about 14 grams per 24 hours.

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So let's say Miss Stilla Watery get some testing done. She has a negative TTG IgA she has a negative HIV screen that was done. She had a fecal antigen that was negative and kind of going along the pathway had normal stool osmolality. And then she did have increased fecal fat on the qualitative testing. So at that point, we kind of talked about ordering additional quantitative testing and what would be the next steps that you would do and would there be any use in endoscopic evaluation?

35:58
Yeah, let's talk about the the situations where you really do want an endoscopic evaluation. So and anyone who's losing weight and they're not up to date on their colorectal cancer screening, you know, and they need to be scoped with a full colonoscopy to make sure that there's no colon cancer driving this, because mild obstruction from a colon cancer can give you diarrhea, right. So, so that needs to be considered if there's any evidence of malabsorption: So iron deficiency, that positive fecal fat, their weight loss, if there's like decreased vitamin B, 12, or vitamin D, you do an EGD. You do duodenal biopsies, because not only are you then ruling out celiac disease, you need to rule out non celiac etiologies from malabsorption. And so those things are those are things like Whipple's disease, right, which is more rare, but combined, variable immunodeficiency can actually cause a celiac sprue like picture without celiac disease. If you're doing the EGD anyways, often we'll do aspirants for bacterial overgrowth evaluation, particularly if they have bloating, and they have those risk factors for bacterial overgrowth. And then if all of your initial testing is negative but diarrhea still persistent and bothersome, they're up to date on colorectal testing, you want to think about a flexible sigmoidoscopy. And that's specifically to obtain random biopsies from microscopic colitis.

37:18
Yeah, which I feel that diagnosis is not as rare as I might have once thought, I mean, now that I'm in practice, I've seen quite a few patients with it. It's actually quite common, and you can, it can be triggered by certain medications that are so commonly used, including statins, those SSRIs and PPIs can do it as well as NSAIDs. So that needs to be considered. I want to make a small note about something called olmesartan-induced enteropathy which you may or may not have heard about. But this induces a celiac sprue like picture and is one of the things that we always ask about on the med rec, because it's so specific one it's really testable and to like when you find it and you stop it, you can really improve a patient's quality of life.

38:06
Dr. Sheila Crowe, with UCSD was on our show a long time ago and told us about that like blew my mind I've yet to I had one case I thought I stopped somebody that was on olmesartan and I was having all sorts of weird GI stuff happening. Paul, you're you're shaking your head.

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No, I don't even know if it's original. I've never seen my patients medication was waiting. They were I can see it. So I can stop it to zero but it has yet to

38:36
Which is different than ACE inhibitor induced issues in the GI tract, which causes more of an angioedema picture and obstructive symptoms. I digress. Sorry, Alina.

38:44
Oh, no. So it's olmesartan specific?

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Yeah, we think that the other ARBs can do it too. But all the literature is on olmesartan.

38:53
I was just wondering the risk factors for small intestinal bacterial overgrowth as well.

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It's like, it's a pretty long list, but you can break it down into things that increase bacteria presence, right? Or things that decrease motility. So whatever bacteria is there can grow. So in the things that increase bacterial presence, we're talking about PPIs. Any immunocompromised patients with diabetes, patients with cirrhosis, patients who are immunosuppressed. In the stasis category, we're talking about places bacteria can hide. So diverticula in the small bowel rule, why gastric bypass is a huge risk factor. Because not only does the blind limb of that surgery give you a pocket for bacterial growth, you also suppress gastric acid, so then that bacteria can really flourish. Anything that slows down motility like scleroderma, that's a big one and radiation to the bowel can do it as well. And then the last thing to really keep in mind is that the reason why the small bowel doesn't have as much bacteria as the colon is because of the ileocecal valve, and so if you get rid of that Valve surgically, or there's some sort of damage with Crohn's

disease, then you're going to risk that bacterial reflux. And some people as they age, their valve just becomes more incompetent, and so more bacteria get into the small. So those are going to be the risk factors.

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Any other testing that we would think about for Miss Stilla Watery? I mean, Elena, do we have more testing on her?

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Yes. So after her testing for fecal fat was positive, and she had a normal stool osmolality, she did get a fecal elastase which was less than 100. And normal, the normal cutoff was greater than 200. So ultimately, there was concern for diagnosis of pancreatic exocrine insufficiency. And you were considering, what do you do next? What is this diagnosis, and should there be any type of enzyme replacement.

40:59
So the pancreatic elastase testing is actually pretty good for pancreatic insufficiency. So that fecal elastase, you can do so the gold standard testing is going to be the secretin simulation tests where you give secretin IV which is supposed to stimulate the pancreas to produce all of its fluids, and you specifically measure the bicarb content in your duodenum. But in order to do this testing, you basically have to have a nurse giving the secretin, and you have to have like a probe into the duodenum, and then you have to aspirate stuff, as you're like, in a certain time after you've you know, and maybe there's fluid, maybe there's not, you did do some damage you're there for a long time. So like, and because you need multiple kind of coordinated testing, it's often not done, you can also do it in an MRI MRCP setting. But again, because of what's needed to do that test, it's not often done, this is kind of one of those situations where sometimes it's easier just to empirically treat them with enzyme replacement and see if they respond. So the thing to remember about enzyme replacement, and I just have really two things to say about that, one is you have to give enough lipase to your patient, you can't just be like, let me try a little bit of kreon sprinkling with, if you're going to try the pancreatic lipase, you have to give them the appropriate dose. And that depends on the formulation. And so kind of really look to what's recommended in the specific formula of whatever compound you're using. The second thing is the most of the pancreatic enzymes assume that you have gastric acid available to dissolve whatever outer coating and activate those enzymes. So if you have a patient on chronic PPI, or they have had a bypass, or for some reason they don't have enough gastric acid, you need to think about giving them a different already activated formula. So the creon is not going to work for them, and you need to consider biocase, which is kind of already pre activated enzyme.

43:07
So with with our patient Miss Stilla Watery, we pretty much diagnosed This was pancreatic insufficiency. So we're gonna put her on the replacement therapy and hope she gets better. But let's say this workup was not fruitful. We didn't find there wasn't fat in the stool, and we didn't really find an etiology despite like the full workup. How are you supportively treating patients

with chronic diarrhea, especially if it's you told us a fancy new name for functional diarrhea. What was it again?

43:39
So while the whole class of disorder got renamed, yeah, to disorders of the gut brain axis.

43:44
So she should be happy.

43:49
Yeah. So she is a disorder. We think she has a disorder of the gut brain axis of functional diarrhea. How are you speaking to patients about that? And what sort of medical medical therapies are you leaning on? or non medical therapies?

44:03
Yeah, so diet therapy, like we talked about is is well, let's back up a little bit. I talked to my patients a lot about what this diagnosis means. Because a lot of the times patients will feel like well, one, I just, they just didn't figure out what was wrong with me, and they're very unsatisfied with not having an organic etiology. Or they feel like oh, somebody told me it's just all in my head, and they may they're made to feel like they're crazy or it's psychiatrically linked, and while we know that stress, anxiety, depression, yes, they are associated with these disorders. They are not somatoform disorders. They're not psychiatrically driven, right? The bowels have a nervous system and we know objectively that there's something wrong with the way that the enteric nervous system is connecting is connecting and communicating with the central nervous system. So my first step is always to validate the patient's validate their pain, their diarrhea, their discomfort, and to tell them that these are conditions that we understand that they are common, we just don't have a test for it. And we don't have a strong etiology for it. But that does not mean that it's in their head. And it does not mean that it's not real, and causing them suffering. And that really helps build a therapeutic rapport, right, because I'm validating their concerns. And I'm listening to them. And I'm letting them know that I'm willing to help them through this. So I think that is actually very important in these conditions. Next, is I'm going to ask the patients what they prefer to they think that they're going to be able to follow some sort of restrictive diet, do they have access to a dietitian? Is that something they want to do? Or would they prefer to try more medication therapy, and I'm doing a lot of the workup that we talked about to make sure right ahead of time, but we've already gotten there. So if they're going for diet therapy, or if they have access to a dietician, then I send them to a dietician to work with them on the thought of on the low fodmap diet, if they don't have a dietician, or if their symptoms are manageable, but bothersome, okay, where they can really kind of, it's been going on for 10-20 years, and they really just want to get it a little better, or it's been going on for five years and just a little bit worse now, but they're really functioning okay with it, then I'll have them do the low fodmap diet from what's called a bottoms up approach.

46:34

So instead of saying, you get rid of everything at once, right, instead of eliminating everything and then reintroducing, I'll give them a list of common offenders and say, Okay, well, are you lactose intolerant? Why don't we get rid of that first? Why don't you try eliminating the fructose group next and seeing you know how your symptoms do and doing it that way where it doesn't really, it doesn't put them as much at higher risk for malabsorption or micronutrient deficiency. And then in terms of therapeutic management loperamide is really safe, like the FDA here has approved loperamide at doses of four milligrams four times a day, but their trials in Europe will give loperamide up to like 100 milligrams. Yeah. And and it's kind of okay, like, sometimes you just need more. And even the guidelines, the FDA guidelines will say that, you know, sometimes the peripheral opiates are just not quite enough. And so you, I'll do loperamide. I'll do lomotil with the atropine. I'll do you can consider tincture of opium, although I'm more hesitant to go down that route. Octreotide can be considered to slow down motility, if there's a concern that there's a motility issue, which sometimes really does get lumped with a functional issue. And clonidine actually works really well as an anti diarrheal. But of course, it's going to be very limited and a lot of our patients because of the blood pressure impact. And then you kind of consider in the back of your mind, especially if it's a young patient, these more rare, like secretory tumors VIP omas, you know, glucagon nomas, that we didn't talk about at all here. Because clinically, they're not as relevant. But I'll you know, on the board exam, they're going to be like super relevant, so important to kind of keep that in the back of your mind in case, you know, there's a functional component, but something just doesn't feel right about the diagnosis, if that makes sense. I have one last plug, sorry, that in addition to the low fodmap diet, some of the other complementary and alternative therapies have had really good evidence for irritable bowel syndrome. So yoga under a guided kind of clinical setting is actually did just as well as a low fodmap diet. And gut hypnotherapy actually outperforms diet therapy in terms of length of benefit. So these patients actually do really, really well. And just a personal plug, I am now certified in hypnosis, and I'm so excited to add this to my arsenal of treatments for my IBS patients.

49:10
That's one of the coolest things I've I've heard on this podcast, you you were you got trained in hypnosis so that you could train your IBS. So you could you could use it on your IBS patients.

49:20
As of yesterday, I completed my level training. I have hypnotized six people today, and they all volunteered. I didn't do any therapy with them. It was just, you know, kind of practice and relaxation, because I don't you know, that's outside my realm of practice. They're they're like, you know, there's a society their society guidelines, abide by them. But yeah, this is a this is a treatment option. There are centers that already have this up and running. I'm hopeful we will soon become one of them. And it's really cool. Sounds a little hokey. It's really not. And it's really cool. How long does it take? 20 hours? And I did not sorry. This is probably digressing. I did not think that after four days I could possibly know enough about hypnosis to actually have it done. Wow, crazy. It's and it's effective. And my colonoscopies today have never required so little sedation. Okay, I'm done. I gotta get on my soapbox.

50:28
I wanted to just bring it back to the I wanted to bring it back to the loperamide just very quickly, because there was some reports in the past like two years, because it is an opioid, at least a partial opioid. I think people were trying to take like mega doses at a time, like 16 milligrams at a time. And then there was some concern for like cardiac side effects, we can link to this in the show notes. So I think you weren't recommending that people take like 100 milligrams at a time. But you're saying if they need to take like, four milligrams multiple times a day, that should be okay. I think it was more the big like bolus at one time people trying to get high from it was the problem. Paul, do you remember?

51:05
Yeah, I think that's right. Yeah, I think that was that that was the diversion concern, not necessarily using it for therapeutic.

51:10
Right, right. So we should be okay, there. So and then I like I like the way that you're talking about the fodmap diet where it's sort of like, I feel like it just gives like, it's like empowering the patient in a way where it just gives them a bunch of options like these foods might cause problems, these foods less likely to cause problems, and then they can kind of be systematic about it and figure out what works for them.

51:32
I think with most chronic conditions, giving a patient a menu of options helps. And I will say that a lot of folks who are very big proponents of the fodmap diet will tell you that the reason to do a full elimination is that there's concern that both fodmaps interact. So that even if you mean, you may absorb one, fine if you eat that one with this other one, that the absorption might be messed up. So that's why it's it's initially presented as a full elimination.

52:04
Yeah, with a dietitian.

52:06
Exactly. So there may be some interactions there that we don't understand.

52:11
I have one other question along those lines. Really about? I've had a few people ask me and then also have been like targeted on Instagram, to, for these at home, like sensitivity test. And I don't really know what to make of them. So how do you think about those,

52:33
it's kind of like the at home, like, you know, genetic panels where then they come back with a gene, and they're like, I'm at risk for IBD. And you're like, Okay, so there's not a lot of data is what I'll tell my patients, there's not a lot of data to support this. And so if you take this test, try it, try eliminating that food and see if it makes you feel better. You know, if it doesn't make you feel

better, don't listen to the test. If it does make you feel better, wonderful, eliminate that food, you know, I don't think you need to hang your hat on it, if it doesn't help your patient on that, that that's the same kind of line of of counseling that I give to my patients about prebiotics and probiotics and synbiotics. There's not a lot of harm, but there's no good data to say this probiotic taken at this dose will really help your diarrhea. And so I told them if they want to try it, they're here are two that have some study driven data to say this is good. So try those. If you don't want to buy a probiotic or sometimes recommend kefir or recommend kombucha sauerkraut, sourdough fermented foods, what have you, just to see if it will help because there's not a lot of downside to it. However, if they're turning to a lot of complimentary or herbal medications that are not FDA regulated, I will tell them that, you know, these potentially have toxicities that I do not know about so I can't recommend them and kind of caution them that way.

54:04
And then what about some take home points for chronic diarrhea.

54:08
So in chronic diarrhea, remember that osmotic diarrhea improves with fasting. And so if that happens, look for dietary sources or potentially carbohydrate malabsorption. Your fecal calprotectin is a really good measure to distinguish inflammatory versus non inflammatory diarrhea. Remember that fecal fats are elevated in rapid transit. So you have to do confirmatory testing and you can't just hang your hat on a mild positive and a fecal fat analysis. And then your workup for when you're considering a functional diarrhea. Think about ruling out celiac disease to your fecal calprotectin or lactoferrin to your bile acid testing if it's possible, and then consider endoscopy. If there is a concern for cancer. If there's a concern for malabsorption you do it from above. And if you want to test for microscopic colitis.

55:00
I think this has been a fantastic masterclass on diarrhea.