

DIGESTION SOS™ DOCUSERIES

Rescue and Relief From IBS, SIBO and Leaky Gut.

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Episode 1: The Center of Everything: Understanding Your Gut & What Can Go Wrong

Dr. Tom O'Bryan: It's very exciting. And I think as everyone gets the big picture overview and doesn't get stuck in what the diagnoses that they have, but rather what's the big picture, where does all these come from, when you keep a big picture overview, you realize it's the diversity of our lives that have set up what we're currently dealing with.

We only have about 23,000 genes. Earthworms have over 80,000 genes. Plants have over 100,000 genes. So, it's not our genes that determine what happens to us. Our genes determine what we're vulnerable to, but it's what happens around the genes—of course, the epigenome that we've all heard of now. And that means everything that's happened to you have set up the environment in your gut (if we're talking about gut).

"Mrs. Patient, your intestines are a tube. It's 20 to 25 ft. It starts at the mouth, goes out the other end. It's kind of winds around in the abdomen there. And the tube, the inside of the tube, is where all the action is taking place. That's where the microbiome is. And it's the microbiome that is 10 to 15 times more cells than all the human cells, and 100 to 150 times more genes than the human genome. Those are the genes that are talking to our genes. That's the epigenetics. It's the microbiome that's talking to our genes, and then determining how our body functions.

When we have gut imbalances, the first place you have to look is what's going on in the gut. And of course, we still have some senior gastroenterologists and specialists—who are really great at what they do—who tell our patients that it doesn't matter what you eat in terms of irritable bowel or SIBO or inflammatory bowel diseases. It's hard to fathom that what you eat doesn't have an effect on what's going on in the tube, right? But it's the tube, it's what's in there that's making a difference.

Kiran Krishnan: In fact, the term for the microbiome is really the second brain or even the other brain. And, you know, it's interesting to think that the brain weighs about 2.5 to 3.0 lbs. The microbiome, when you look at all the bacteria collectively, weighs about 2.5 to 3.0 lbs. So, they're very similar in many different ways. I don't know if that has any biological significance, but it's just interesting.

Now, the microbiome is the only organ within your body that operates autonomously. And for people that don't know what the microbiome is, it's really a collection of organisms and all of their genetic elements inside your system—in and on your system really because your skin and your eyes and everything's covered with bacteria.

We used to think that there were parts of the body that was sterile, like your urine or blood or your eyeballs and things like that. Now, we know everything's covered in bacteria. If you look at your blood, it used to be, 25 years ago, if a doctor found a bacterium in your blood, they would freak out that you were having blood poisoning. Right now, as it turns out, we've got over a thousand species, a thousand cells of bacteria for every milliliter of blood that we have in our body.

Dr. Sheila Dean: Well, you know, when you think about it, we were told or we read and we understand that there are not billions, but trillions of bacteria that live in the intestines. And then, you think about how many cells we have in the human body. And we think, "Well, it's certainly not in the trillions." And it really does beg the question: "Who's hosting who?"

It really kind of expands to the importance of why the kind of bacteria that you live with can affect your health so much.

Dr. Pedram Shojai: And here's the thing, if you can turn the tide, then life can go back to more normalcy. What you've gotta do is just you gotta starve out the bad players, and I'm a big fan of—depending on the degree of insult—either you hit 'em with an antibiotic, or you do natural antibiotics and substances that will keep kind of batting down those colonies while you're not feeding them, and eventually when the forest looks different, then you have different tolerance.

This is a word that's actually come up a lot in my studies in microbiome, is tolerance, because as you have the right players in the gut what happens is, they start to mediate. It's like having a lot of good neighbors, and then you have like one, a couple bad kids; there's neighborhood watch, and then they're all just kind of like looking out for each other, and they're like you kids can't do that here.

Whereas when the neighborhood falls apart, and it's like spray paint on the walls. So, when you've got SIBO, there's spray paint on the walls, and there's problems because the bad players have kinda run down that neighborhood. You start putting in good players, you stop feeding the bad behavior and bad players in the neighborhood on this thing, and eventually the neighborhood starts to shift. And all of a sudden, it's more peaceful and less just tumultuous, and then you go back to normalcy and you have more tolerance of said foods.

Dr. William Salt: You are influenced by your nature or by genetics. By analogy, these are like the cards that you've been dealt.

You're also influenced by your environment, which is the world you live in and your health-related behaviors. And you're under constant attack by multiple antigens or bad guys from which you must defend yourself to live a healthy lifestyle.

When you eat, you're ingesting the environment. You're ingesting the food which also harbors many antigens or potential bad guys. And we'll soon see how your gut protects you and defends you.

You can influence your genetics by how you play your hand. Genes are turned off and on by your health-related behaviors. Science shows that really 75% of our health is related to the environment, meaning our health-related behaviors.

So, you should be able to appreciate we've got a lot of potential therapeutic targets here and opportunities for healing. We can consider your symptoms to be an opportunity to target and take control of your gut health and profoundly affect your overall health. **Dr. Keesha Ewers:** Hopefully, lots of hope because, at the end of the day, you wind up saying, "Oh, so this isn't just about Rifaximin" or it's not just about whatever natural thing I can take to kill these bacteria off. I actually need to link in and loop in the whole puzzle, all four corners, not just hang out in this one where it's all about supplements or antibiotics or FODMAPs where I'm just thinking about the physicality of it. I really got to get underneath the emotional/mental component of this.

And again, Ayurvedic medicine taught me this because I was sick, and I had to do this. It talks about the fact that we have five layers to us. We have our physical structure. And we have our energy or prana or chi or qi (other frameworks of medicine talked about it differently too), or electromagnetic energy field (that's the next one). And then, we have our emotional and our mental wisdom body. And then, we have this place that we can go to for creativity. It's called anandamaya kosha or our bliss sheathe. So, if we're toxic in our physical structure, we don't feel very blissful.

So, it gives us this map of "Oh, this is possible." And we've all experienced that epiphany or moment of inspiration—like in the shower, I get them. I'm washing my hair and all of a sudden, it'll solve a problem, or I'm out for a long run in nature and I'll solve a problem. And so, that's that access to that place which is our whole collective consciousness. All wisdom is contained there. Well, who wouldn't want to just go hang out in that?

So, we have to get underneath how all of it interacts, how the mind and the heart and the body and the spirit all interact with one another. We can't just talk about FODMAPS.

Ocean Robbins: So, if that works for you, great. If it doesn't work for you, find what does. You're your own expert, the only expert on your body and your health. Everyone else is just a resource.

Dr. Ilana Gurevich: IBS is this gigantic umbrella. We think, based on the latest research, that SIBO is 70% of that umbrella. IBS is any irritable bowel syndrome. Anything that makes the bowels irritable—gas, bloating, diarrhea, constipation, pain, a mixture. SIBO is a functional disorder, which means when we go in and do colonoscopy, we find nothing. Endoscopy, we find nothing. Upper GI, small bowel series, which nobody does anymore, or CT enterography or MRI enterography, we find nothing. It's not pathological. You hear functional and you're like, "I'm stressed. This is a function." But no, it's the microscopic functions of the small bowel and large bowel that aren't working. That's IBS.

SIBO is that these functions are not working, and we find bacterial overgrowth because, let's be honest, at this point it's the easiest thing we can find.

Shivan Sarna: And if you could describe SIBO—what is it?

Dr. Allison Siebecker: It's kind of like what it sounds like. It's a rather simple concept that leads to a lot of complications. It's when there's too many bacteria in the small intestine. They've accumulated there and they're not supposed to do that.

Normally bacteria they come through our nose, our mouth. They're coming through us all the time and they're moving down and through the small intestine down into the large intestine. So just a quick gastrointestinal anatomy review is that we've got the mouth, esophagus, the stomach, then the small intestine, then the large intestine. So, the small intestine is in the middle of the whole system and bacteria is supposed to move through them down into the large intestine. That's where they're supposed to accumulate. Most people know we have a lot of beneficial bacteria in our large intestine. They do good things for us. But when they get stuck in the small intestine or if they backflow up there it's a problem.

Shivan: One thing that became clear to me is that the small intestine is longer than the large intestine.

Dr. Siebecker: I know. It's not fair that it's called the small intestine. I don't like that. It's thinner than the large intestine but it's longer so it's kind of a misnomer.

Shivan: And so, the food goes from your stomach into the small intestine before it makes it to the large intestine.

Dr. Siebecker: Yes, and the small intestine is actually where we do most of our digestion and absorption. It's the most important for that. And that's what gets disordered and out of sorts when we have SIBO. All of our digestion and absorption can be messed up and that is a lot of suffering and problems.

Shivan: If you have leaky gut is it that your small intestine is leaking?

Dr. Siebecker: You can have it anywhere. You can have leaky gut anywhere in the intestinal tract. You can have leaky esophagus, leaky stomach, leaky small intestine, leaky large intestine. The word gut means that all of those organs. It's a nonspecific word.

Shivan: It's kind of makes sense because it's a lot of tubes. I'm just thinking of plumbing now. Like you could have a lot of leaks in tubes under the sink, right?

Dr. Siebecker: Yes. And those tubes go down into the basement and then they run up to the second floor.

Shivan: Right, right. Why should we care about SIBO?

Dr. Siebecker: Because it's so common and that's why we're doing this. So many people don't know about the term, so many doctors, so many patients. A lot of people know about the term IBS, irritable bowel syndrome. But that is just a collection of symptoms. It's a disorder that's defined and diagnosed by symptoms which are the same as SIBO. And those are abdominal bloating so that's when the belly swells out. Very unpleasant. Constipation or diarrhea or a mixture of the two. And then abdominal pain or discomfort. So those are the main symptoms of both of them. But back to your question about why we should care. First of all, those symptoms can

be rather severe, and they always bother somebody when they have them. And so many people have them. The stats are that 20% of the world's population has IBS and we know from studies that on average 60% of IBS, the underlying cause is SIBO. So that's a lot of people and we really do need to care.

Shivan: It's the number one GI tract illness and complaints.

Dr. Siebecker: IBS is the number one gastrointestinal condition in the world. And SIBO is the majority cause. We need to get this information out and help people.

Shivan: Which is exactly what why we're doing this. Is SIBO a new condition?

Dr. Siebecker: No. I would assume it's been around as long as humans have been around. But it's probably the terminology or understanding is newer. The history is that for as far back and I can look into records from our modern time people have been talking about it but with different names. Like one of the names was contaminated bowel syndrome. And there are other names. But what really happened was it got brought into a lot of people's awareness when it was linked with IBS. The condition was known about throughout the sixties, seventies, eighties. A lot was in medical literature about it, but it was thought to be obscure and rare.

Then what happened was Dr. Pimentel and his colleagues were doing studies and theories and they decided that they thought that IBS could be caused by SIBO. And they started publishing articles on this and it was very controversial when they did that because whenever you're going to link something to something that affects so many people other doctors are going to have to question it. That's normal and decide if they think it's true. So now it's been about 15 years or more and the studies are pretty definitive that that is so, that SIBO is a cause of IBS, as we know 60%. So that's what's brought it into awareness. It's not new, it's just how we're thinking of it that's new because now we're thinking that it's common and that, in fact, it can cause the most common GI condition of all. So that's what's changed.

Shivan: And also, the most common GI condition of all, IBS, has been fairly controversial. Not so much now but it has been in the past. You've got controversy on top of controversy and I hear some people talk about how is SIBO the new candida like this new trend in holistic health and I just don't think it is. I think it's something that really should be so mainstream.

Dr. Siebecker: However, I'll take the fad status because you get to fad status before you get generally accepted. So, we're on our way.

Shivan: Yes, it's legit.

Dr. Siebecker: Right. It's like we're getting there. But yes, it is—there really shouldn't be any controversy about it as a medical condition because that was well established in the medical literature before people started really getting excited about it with its connection with IBS and before people started thinking it was a fad. I

mean it's a set condition. What I'd like to see is any of this controversy that's left or tension going into proper research and spreading it so that everybody just knows.

Shivan: Exactly. Especially because it's so hard to treat.

Dr. Siebecker: It's tricky.

Shivan: Very tricky. I also wanted to just talk about SIBO, S - I - B - O, is sometimes called S.I.B.O. and sometimes it's called SIBO and sometimes people confuse it with oh, that's just IBS spelled funny, right. Because it basically has the same letters-ish. And so, we don't really care what you call it. It's something that we all need to know about it. But when you just look at it visually.

Dr. Siebecker: Pronounce it however you want. I don't care. I just pronounce it the way that the leading medical researcher in SIBO pronounces it and that's Dr. Pimentel and he pronounces it SIBO so that's what I say. But sometimes people say CIBO and SIHBO. I don't care.

Shivan: And what are the symptoms?

Dr. Siebecker: They're the same symptoms as IBS which are bloating. I know we just said this, but I'll say it again. Bloating, constipation, diarrhea, a mixture of the two or abdominal pain or discomfort. But then there's more. And basically, you can have the whole host of digestive symptoms affect you if you have SIBO. And it could be from the SIBO. There can also be acid reflux. There can be nausea. There can be a feeling that food is sitting in the stomach and won't go down like a brick or a rock. Very, very uncomfortable.

All of those sorts of things can be called dyspepsia. Dyspepsia is part of it. That just means sort of upper stomach uncomfortable yucky symptoms soon after eating. There can also be excessive burping and farting. There can be fatigue. Probably one of the most common symptoms is food reactions or food sensitivities. And mostly this will wind up being carbohydrates. However, carbohydrates are one of the three main macronutrients of our three main food groups. It's a vast huge array of foods. It can feel like it's everything.

Shivan: And it's the tastiest part.

Dr. Siebecker: All the best stuff. A lot of problems with food sensitivities. And then there can be mood symptoms. Depression and anxiety. I often see in patients that anxiety is more common than depression, but both are possible. There are some studies to show that anxiety tends to be a bit more common. Very unpleasant. And then there can be the symptoms of leaky gut because SIBO can cause leaky gut. There can be really any reaction to food. That's really what the leaky gut symptoms are that is systemic. Not so much gastrointestinal. It could be like nasal mucous, skin rashes, brain fog or issues with cognition. There could be respiratory problems like sneezing or even asthma that comes after you eat food. So those would be the leaky gut symptoms. And I think we could just stop right there, that's enough.

Shivan: That's enough.

Shivan: What exactly are the mechanisms or how are exactly these symptoms caused?

Dr. Siebecker: The main way the symptoms are caused is from gas, bacterial gas. Gas that comes from these microbes. What happens is when we eat, we are supposed to normally break down, that would be digest, and then absorb our food into our body. But a portion of our food will not be absorbed because it's indigestible to us and that would be called fiber. And normally that will move down through the small intestine down into the large intestine. The large intestine is where all the bacteria are, and they can eat it. They have the digestive enzymes to break apart fiber, we don't. Humans don't. And so, they can break it apart. They digest it and they eat it. And then they make gas out of it. Fiber, not a lot of people know this, but fiber is a carbohydrate and it turns out that carbohydrates are bacteria's primary food. It's the thing they love the most. I get it. I love carbohydrates too. When most bacteria, when they eat, they make acid and gas. Gas is one of their end products. We can always blame any kind of gas that comes out of us on them. I just want you to know that.

When they make this gas normally in the large intestine it's a normal amount and we just expel it as farting and sometimes we don't even really know we're farting because it's just so small, a little bit throughout the day. Just normal to expel that gas. Then we don't get bloated.

But in SIBO what happens is the bacteria is translocated up into the small intestine or they've just accumulated coming from the top down and they're in the small intestine. So now when we eat a meal with carbohydrates the bacteria are right there sitting right up high and they can eat them too. Then they do and then they turn them into gas. And then that gas can swell in our small intestines and bloat us, and the bloating can be quite high up. It could be low down, but it could be anywhere in the whole—because the small intestine actually coils and covers around our entire abdomen from the top to the bottom. So, then we can get all this bloating and distention.

The gas can also cause other symptoms because the methane gas, there's three types of bacterial gas—hydrogen, methane and hydrogen sulfide that are the primary ones. Methane gas has been shown to actually cause constipation. It can slow the motility. In fact, it can even cause reverse hyper motility in the small intestine. So that means backward, upward motions of the small intestine. Totally abnormal. If it does that some symptoms that can go with that are nausea, acid reflux and burping.

Now sometimes you'll have those symptoms even if you don't have methane gas but so it's pretty interesting to know that constipation, acid reflux, nausea and burping can all be directly associated with methane gas. The other gases they can lead to like hydrogen has been linked with diarrhea and we don't know the exact mechanism there, but we do know that it's linked to it. And then pain can come very often from gas because the intestines are sensitive to pressure and gas, imagine like a balloon, its pressure pushing out. Our intestines sense that and usually sense it as uncomfortable so it can cause pain. The other thing is that the muscles in the abdomen can contract against the gas and muscular contraction causes some pretty bad pain. The pain in SIBO can be mild, it can be discomfort or it can be really bad pain. Pain that wakes people up at night and even sends them to the emergency room. It just depends on how their body is reacting to the gas. And the last thing is visceral hypersensitivity. That's a feature of IBS and most people with SIBO can be said to have IBS. And it's not fully well understood but what it means is that though people with it feel sensations in their organs which normally we

do not. We don't normally pick up feelings down there. And they're felt as uncomfortable. We can feel the gas moving through and it hurts. So that's where the pain can come from.

The acid reflux can also just come from gas back pressure so it's pushing acid up. And then the excessive burping and farting can just come because there's excessive gas that's trying to get out and is being moved out. Now interestingly not everyone with SIBO will have excessive burping and farting and sometimes we're pleased when they start burping and farting because the gas is being held in there causing pain, causing bloating and we know it's a good sign for those people when we start seeing burping or farting because it's getting out and they usually feel better.

Shivan: That would almost be like a different kind of understanding for motility. I mean it's moving.

Dr. Siebecker: Right. When somebody does have excessive burping and farting, we at least know that some of their motility is on board and working because they are getting some of the gas out.

Dr. Norm Robillard: There was a disconnect. In 1949, a guy named A.C. Frazer, he studied malabsorption and nutritional deficiencies. He wrote a book on malabsorption in 1949. And it described SIBO perfectly, bacteria from a fecal origin growing on the small intestine and competing with the host for essential nutrients.

And people called him out in the journals. They criticized him and they challenged him. And he fought back tooth and nail. He describes SIBO perfectly in 1949.

Meanwhile, a year later in 1950, another paper came out in IBS. And they described it as basically psychosomatic or a mental disorder.

And that gap lasted for 50 years until people like HunterLab in the UK connected gas to symptoms in IBS patients. A low residue diet helped. They had cultured the bacteria in the small intestine. It showed that it would grow. Pimentel's group jumped in and they showed if you knock these down with antibiotics, the symptoms improved.

So, it all started to come together, but that was 50 years after the first description of SIBO and the mis-description of IBS.

Shivan: So, what's the difference between—or how do you define IBS?

Dr. Michael Ruscio: So, you have your Rome Criteria for IBS which is very specific. And that's what you would use if you're publishing a research study or just trying to diagnose IBS. And then, there's the symptoms that are associated with IBS but may not fit a specific pattern to diagnose IBS. And so that's actually a very good question because we should, again, be discerning in our language.

The IBS symptoms, most notable are abdominal pain and altered bowel function constipation or diarrhea or an oscillation between the two. Sometimes, you have lumped in with that bloating. And we know there's an overlap with other symptoms like GERD, reflux. But mainly, abdominal pain and altered bowel function are the two most notable of these symptoms. So, it's probably more accurate to use IBS-like symptoms or digestive systems to refer to this broad constellation of symptoms we sometimes call IBS.

Shivan:	And then, how in your brain does SIBO relate to IBS?
Dr. Ruscio:	Well, there is a relationship.
Shivan:	No, no, I know. How do you explain that?
Dr. Ruscio:	Well, I know. We're preaching to the choir.
Shivan:	Yeah. But how do you explain it to patients? What's that

mechanism?

Dr. Ruscio: Well, it's one of the underlying causes that may contribute to IBS. And quite simply, bacterial overgrowth SIBO is one of the causes of IBS—but it's not the only cause. And I think that's important because with how wonderful it has been that we've increased the awareness of SIBO, we don't want to represent it as such that the only cause of IBS is SIBO.

But the estimates are anywhere from 4% to 84%. And gosh, I believe the Rome Foundation analysis found around a 40% to 50% causation when they average out all the data. So, it's definitely significant, but it's not to say that, for everyone, the cause of IBS is going to be SIBO.

Dr. Mark Pimentel: So, this is always a question that people ask. Is it SIBO or is it IBS? And the answer is it's both.

So, let me go back and explain peptic ulcer disease. Back in the 1980s, ulcers of the stomach were all the problem. Everybody was having ulcers. They were bleeding. And we didn't know what was causing it.

And so, a gentleman by the name of Dr. Barry Marshall discovered H. pylori. And H. pylori was suddenly the cause of ulcers. Now, H. pylori only caused 70% of ulcers. It didn't cause all of ulcers. It only caused 70%. But of course, it's a big discovery. The irony is that the disease, peptic ulcer disease, didn't change. The name was still peptic ulcer disease. It didn't change to H. pylori disease because there were other causes of peptic ulcers.

The same thing here. That's what I'm getting at, is that IBS is an umbrella. And if we can explain 70% of IBS based on a microbiome shift, it's still IBS, but SIBO or bacterial overgrowth is the cause of the symptom in 70% of patients—which is, again, similar to what we saw in H. pylori.

Dr. Megan Taylor: So, often, we get diagnosed with SIBO often after a long journey of having IBS symptoms, and we're like, "Yes, that, that's it. That must be it." And oftentimes, it is. But maybe it's only a part of it. Maybe it's only 50% of your symptoms, but the rest are due to something else. And that really needs to be addressed.

Dr. Satish Rao: In our studies, I've been hard-pressed to use the term IBS. We've called it mostly unexplained GI symptoms which to me is correct. I really don't know because, many times, we can't fit. So, you take a hundred patients with these unexplained symptoms, and if I strictly enforce the IBS definition on them, maybe 40% or 50%, I might call them IBS. What am I going to do with the remaining 50% of these people? Am I going to say, "Well, I didn't study them" or "They're non-IBS." It becomes hard.

So, that's why I have tried to stay away from calling them as IBS because by calling IBS, then I'm strictly going to limit my sample and my patients, or there is going to be overlap and we call it IBS functional bloating and IBS dyspepsia, like Dr. McCallum was starting earlier on, or IBS and then these are a mix of all of these people. That's why I call them "unexplained GI symptoms."

Shivan: "Unexplained GI symptoms," I like it.

Dr. Salt: I'm introducing a new term enteropathy. This is the triad of symptoms: abdominal pain and discomfort; it's gas with abdominal bloating, distension, flatulence and mumbling and grumbling; and bowel dysfunction with constipation, diarrhea or both.

This enteropathy triad of symptoms indicates an unhappy and unhealthy gut and implicates disease or dysfunction of the small intestine, colon or both.

But most people with enteropathy feel unhappy and unhealthy generally since they suffer with many other non-gut bodily symptoms like brain fog, fatigue, pain and skin trouble. So, you're going to discover that when you're healthy, your gut is in a state of balance, represented by the balanced teeter-totter. You know how important your brain is. But there's a second little brain in your gut that lines the gastrointestinal tract inter-communicating 24/7 but also functioning independently to control the gut.

Dr. Salt: So, you're here with symptoms of enteropathy. Let's take a closer look as we begin to see this big picture together. And I'm going to represent through this webinar with the orange circle your small intestine, your colon, or both, the source of your symptoms. And the triad includes abdominal pain or discomfort. Some people don't call it pain; instead they'll call it discomfort and gas with bloating (which is a symptom), abdominal or belly distension which is actually an enlargement

(that's a sign), flatulence and noisy sounds with bowel distension with constipation, diarrhea or both.

Well, most healthcare professionals recognize this symptom triad pretty quickly as IBS. As long as concerning features are absent like blood in the stool or unexplained weight loss (which we're going to be calling red flags for short).

But there's a major problem with this approach.

The diagnosis of IBS at this point blocks both the patient and the healthcare professional from considering the many causes and conditions associated with this triad of symptoms called enteropathy—which is why I recommend recognizing this triad of symptoms initially as enteropathy rather than IBS.

So, both the patient and the healthcare professional are encouraged and compelled to consider these causes and conditions.

Dr. John Dempster: "Now, what really is leaky gut syndrome? We hear a lot about this. Well, it's very similar to, if you think of Swiss cheese. And the medical definition of leaky gut syndrome is intestinal permeability or gut permeability. We really don't want to have any microscopic pores. And if you think of what Swiss cheese looks like, well, we don't want that to be our gut lining.

Now, this isn't necessarily visible if you were to do a colonoscopy. So, a lot of the ways that we are actually diagnosing leaky gut syndrome today are using biochemical techniques, not necessarily cameras or imaging. So that's important to note. But we are seeing so many connections to, as I mentioned earlier, a lot of inflammatory conditions. And we can start to see some of that inflammation through whether it's a colonoscopy or an endoscopy. But the actual intestinal permeability is going to be detected by some very specific means."

Dr. Dempster: So, this is a visual to give you a better idea of what these cells look like in our gut. And often, they are literally just one cell apart from your bloodstream which really makes it such a vital and critical area to focus on because, if we're that close in proximity to our circulation, what we do to those cells is vitally important.

Now, you can see on the left here a healthy digestive tract, what that looks like. We've got very tight junctions. That's a healthy schematic of what our intestinal cells should look like.

Well, then we've got to the right our healthy permeable gut lining. And these are things that, you can imagine how that would start to impact us by seeing the schematics here—a lot of inflammation, a lot of these undigested food particles. This is where a lot of other particles that come in through our environment are getting put into circulation. They can create a huge perpetuating inflammatory condition in our gut and beyond.

Dr. Lisa Shaver: Okay! So, what's going on with leaky gut?

So, we have to have something causing irritation to the small intestinal lining—it could be food sensitivities, it could be food allergies, it could be medications that we've been prescribed or medications that we're taking over the counter, it could be an overgrowth of bacteria (so SIBO and leaky gut), overgrowth of fungus (so SIFO with an F, fungal overgrowth or yeast. That can be involved), it can be food additives, preservatives and colors and dyes.

So, the standard American diet has a lot of these things in it.

And also, the standard American diet is typically not organic. And so, the things that are non-organic food are your glyphosate which is in the RoundUp, which is on GMO foods, genetically modified foods. And that, we know, has caused leaky gut.

So, a ton of things that we might be exposed to on a day-to-day basis...

Shivan: Parasites?

Dr. Shaver: Absolutely parasites. I mean, the list is long. The list is really long. Those are just a few from the from the top of my head.

So, there's all of these things that we are exposed to as humans on this earth, on this modern Earth, on a regular basis that can cause leaky gut.

Dr. Shaver: Okay, so how does leaky gut happen?

So, these substances, whether we intentionally ingest them, or they're uninvited critters in our small intestine, what they do is they irritate the lining. And what we know about the small intestinal lining—so I used to teach histology, which is a study of cells. So, I used to look into microscopes and teach medical students how to do that. So, in the lining of the small intestine, we have sort of hills and valleys. And on those hills and valleys, I'll say there's different trees. And on the trees, there are branches coming off. And those branches we call villi, V-I-L-L-I (and one is a villus).

So, I'm going to say, on this tree, there are these villi coming off.

Shivan:	Some more over here too. Oh, no, no, I'm just being a villi.
Dr. Shaver:	Yes, yes. There are branches coming off, right?
Shivan:	Yeah.
Dr. Shaver:	So, then I'm going to say that this hand now is one villus.
Shivan:	Okay.

Dr. Shaver: ... or villus, one villus. On the villus are our intestinal cells, which we want to be nice and straight. They're called columnar. We want them to be like nice, straight columns.

And they have tiny little pores on the top that are supposed to take in dots of food. We don't eat dots. We eat chunks, right? We eat a carrot, or we slice a piece of salmon and we eat it, right, or kale or whatever we're eating. So that goes into our mouth. And we have carbohydrate enzymes in our mouth and chewing acts in—so chemical and mechanical ways to break down food.

Dr. Shaver: We swallow it, it slides down the esophagus into our stomach. And that's where we have, again, sort of a smushing mechanical action, and then a bunch of chemicals—so those are stomach acid and our digestive juices. Those are all breaking it down into smaller bits. So instead of a chunk, we've broken it down into smaller bits.

Then those smaller bits are dumped into the small intestine. And we've got the gallbladder and the pancreas pushing out juices that are supposed to break it down into tinier dots. And then, eventually, once it gets out of the first say 12 inches, and into that 15 or 20 feet of small intestine, they're tiny little dots and we go back to those columnar cells, those are small intestinal lining cells, enterocytes, the small intestinal lining cells.

They're supposed to be going through right on top, right on top here. But what happens is that if there's irritation, it opens up and big chunks get through.

And we have blood vessels down here. And they get introduced into the blood vessel. There can be an inflammatory reaction in this tissue below. And then, it gets introduced in the blood vessel. And then, we have both inflammation sending out inflammatory proteins, and these toxins (and toxins means things that don't belong in our body or they're not beneficial for us. Toxicants, toxins, things we don't want). That can be introduced to the bloodstream.

So, suddenly, we have all these funky things in our bloodstream. And our blood goes everywhere. Eyes, eye pain; head, headache; ear, ear pain; heart palpitations; skin, skin rashes. And that's why food sensitivities can be anywhere in the body, anywhere in the body.

Dr. Sheila Dean: And when the gut is not 100%, also known as leaky gut—which is a whole different phenomenon which we can talk about—that opens the door to conditions like autoimmunity.

Autoimmunity basically just means an immune condition where your immune system is attacking yourself. It's extremely prevalent. Something like Hashimoto's thyroiditis, that's autoimmune. And that's prevalent in women; rheumatoid arthritis, rheumatoid arthritis is where your body is attacking your own joints (so osteoarthritis is inflammation of the joints, but rheumatoid arthritis is not just the inflammation but where there's an autoimmune component).

So, all these different kinds of autoimmune conditions can happen as a result of intestinal permeability—which is just a fancy term we see in the literature for leaky gut.

So, that circles right back to your original question of why it's so important to keep the gut healthy... because it just opens this Pandora's box of all these different conditions, especially whatever you're genetically predisposed to.

Dr. Salt: The tight junctions are the spaces between the cells. They're responsible for leaky gut. They're another component of gut barrier. They're like little doors. They were once thought to be closed tight. But Harvard's Alessio Fasano has discovered a protein in the cells called zonulin. In response to gluten and gut microbiome dysbiosis, zonulin gets released into the gut and loosens the tight junctions resulting in leaky guts. And this can affect the whole health of the individual.

Dr. Salt: So, leaky gut permits a variety of antigenic intruders to penetrate the epithelial cell layer and come through the tight junctions and influence the lamina propria where a defense system is designed to protect you. They're going to allow whole bacterium to come through. This is bad for the gut. It's bad for the body. And it's bad for the brain. And it results in chronic inflammation, autoimmunity and allergy.

I've got an animation here for you that will show this to you at another level.

Most harmful bacteria—microbes, viruses, antigens and toxins—enter the body through the gut and the respiratory system. So, let's take a look at what happens when a bad guy comes through.

Note the tight junctions. They're like little red doors there in my animation. And there's an antibody. We talked about the secretory IgA. It's a protective barrier. And here's a bacterium that's not dangerous. And here's an antigen which is not dangerous. But we're going to introduce a very dangerous bad guy over here on the left side.

Within the gut lumen, we've got dendritic cells. They're like doormen. They're responsible for recognizing intrusion by antigen. And the immune cells are charged of course with the huge responsibility of determining whether the antigen is a good guy or a bad guy.

So, let's see what happens here. Unfortunately, collateral damage can occur. So, zonulin gets released in response to a bad guy. And the antigen then comes through the loosened tight junction.

The dendritic doorman recognizes this entry and escorts the visitor to the immune cells. And this is called antigenic penetration and presentation. Immune cells are charged with the very enormous responsibility of determining whether the antigen is a good guy or a bad guy and protecting and defending the gut and the body.

Well, in this case, the antigen is indeed a bad guy and bound to the immune cell which generates a sophisticated and inflammatory response with what are called cytokines which neutralize the invader. But unfortunately, there is commonly a price to be paid here because this response can actually injure the gut epithelial barrier. Now, you're set up for a vicious cycle. You get more leakage; this allows more antigen to

penetrate. And now you can say there's a vicious cycle occurring. And this is occurring in the gut, the vicious cycle in the gut.

And the collateral damage of the protect-and-defense process, with this process, this leaky gut, because this isn't limited to the gut can affect the entire body with inflammation, autoimmunity and allergy.

Dr. Partha Nandi: And so, when you talk about inflammation, we talk about every single specialty of medicine. So, I'm a physician. I treat patients mainly in gastrointestinal or gut diseases. But when I see patients, they have every disease on the planet. But they all have one common factor, which is inflammation.

And inflammation means this, your body either attacking an organism or a bug or something that's foreign and causing inflammation, or it's attacking itself. And so, when it attacks itself, even in a microscopic level that you can only see under a microscope, that's the beginning of something called cortisol and all the hormones that are increased with it. And that's the beginning of disease.

And so, what we try to do is say, "Okay, where does it come from?" And we now understand that the gut—and I'm biased because I'm a gastroenterologist, and I love the gut, right? But it looks like the gut is where it all begins.

And so, what does that mean? The gut is the last place we really don't have any barriers. I mean the skin has a barrier, your lungs, your heart, everything else. But the gut, you take a piece of whatever you eat, just put in your mouth, and your body has to do this, it has to digest the foods. But all of the stuff that comes from the environment and all the bugs and critters that are on the food has to be handled by your intestinal system.

So, as many of you know, the difference between poop on this side and blood is one cell layer thick. And we're talking about its intensely small—very, very thin. However, incredibly tight. So, you can't get past that barrier unless—it's like being in a club in Miami—unless you got a pass, you gotta have this, you got to have your name on the list. So, if you're a protein, you have to have a receptor. If you're a carbohydrate, you have to have a receptor.

But then when you start damaging that barrier, that one cell layer of barrier, guess what happens? You start getting little holes in it, holes that you and I can't see. But guess what? The little particles that you're eating go through, and they start causing a reaction.

We're talking about every single defense system in your body goes there. It goes into that barrier and says, "Something's happening." And so, you've got your FBI, your CIA, ATF, local police, your volunteers. They're all going there. They're going through the defense system in your body. And so, it's attacking something that really is not something that's foreign to you. It's not something that's going to kill you. But that inflammation that begins starts the process of disease.

And here's the thing. If you eat something that causes inflammation or cause irritation once in a while, it's probably okay. But what's happening in Western society (and now most of the world now because the world's following the West, right? Because we are the leaders), it's happening every single day, hundreds and hundreds of times a day.

So, that inflammation builds and builds and builds and produces lots of stuff that's not great for you. And I talked about cortisol. And that's the beginning of what we call small remnants of the fight-or-flight reactions.

So, my patient says, "What does that mean, fight-or-flight?"

Dr. Nandi: Well, when we used to be hunters and gatherers, right, Shivan, we would have tigers chasing us or whatever animal. And we were ready because the fight-or-flight got us the energy, and we were active and alert. And that prevented us from being lunch on an animal's plate. So, it was great!

But now, we don't have animals chasing us, your body is still pretty primitive. When you've got this inflammatory response happening all the time, your body is gearing up—gearing up all the time for this action.

And it's small amounts of the same reaction that produces cortisol, epinephrine, all of the mediators, all the ways that your body can get inflamed. Then eventually, the inflammation builds.

And by the way, in that barrier space in your gut, the cells, all of the stuff that is causing this inflammation, guess what, they talk to the cells in the brain, in the heart, in the lungs. We now know that they actually have special communications directly to these cells and the whole body is in a state of inflammation.

People don't understand, "Well, how could I have psoriasis in this elbow area from the gut?" It's because those cells that are getting inflamed in your gut are talking to the rest of your body.

So, that's why all really begins in your gut. You got to take care of that gut.

Naveen Jain: When we are ignorant, we actually, to a large extent, don't know what is going on inside our body. And then we rely on so-called experts. And many of these experts, it's not their fault. It's not that they're bad people. They're just not taught that way.

So, when you graduate from a medical school, you're not taught about nutrition, you're not taught about the microbiome, you're not taught about holistic health. What you're taught about is "I am an expert in kidney. I am an expert in diabetes. And by the way, I'm going to give you the medicine for solving that problem. And if it causes other problems, that's not my problem."

But if you look at the whole, I would say, industrial health complex, the thing is it's an incentive to actually not make you healthy. If you think about it today—it's kind of a

really cynical view. In a healthcare system, everyone makes money when you're sick...

Shivan: Yes!

Naveen Jain: And no one makes money when you're healthy.

Now, I'm not saying people are bad. But when you're incentivized that way, what are you going to do?

Now, imagine when they find someone, you or I or anyone who has a chronic disease, somewhere along the line, someone who's thinking, "Hmmm... lifetime subscriber!" Now they found a lifetime subscriber as opposed to understanding what is causing that chronic disease inside each one of us.

Every chronic disease is caused by chronic inflammation. However, what causes that chronic inflammation is very individual to each one of us. So, as opposed to understanding what is causing the inflammation in your gut, my gut, or someone else's gut, we all say, "Let's not worry about why it is going on. Let's just look at the symptoms. And let's suppress that symptom because now you have to take my drug for the rest of your life. I've got a subscriber."

Shivan: When I hear the word inflammation all I think of is whatever you do get rid of all of your inflammation because it causes cancer, but this sounds like it's an antibody to the condition. Is that a way to look at it, like it's good inflammation?

Dr. Steven Sandberg-Lewis: I'm glad you brought that up because a lot of people, I don't blame them, they don't understand that it's a complicated concept. There is acute inflammation and chronic inflammation and there's different types of chronic inflammation. Basically, it's the chronic inflammation that is defined by three things: chronic inflammation is acute inflammation, attempt at repair, and tissue death...all happening at the same time often over months or years or decades. That's the kind of thing that stimulates the body to try to figure out what it can do about this constant irritation. Cancer is one of the possible mechanisms. The body changes and tries a different kind of cell.

Unfortunately, that cell might be neoplastic, it might be malignant. That is a type of inflammation often associated with suppression of acute inflammation. In naturopathic medicine acute inflammation is considered a good thing. You need to control it if it's getting too intense, so you don't lose the patient. But acute inflammation, often in Western medicine, is suppressed. If you get a cold or a flu take NyQuil, take lots of ibuprofen or Tylenol, suppress the inflammation. In naturopathic medicine acute inflammation is the way you get over things, it's the way you get better, it's your body's best attempt at getting well.

If you continually suppress it and take vaccinations to prevent acute inflammation, you end up with more autoimmune disease, chronic inflammation. Autoimmune disease is a type of chronic inflammation and many of them are predisposed to cancer. Inflammation is our friend, but you need a good doctor that knows how to manage it, so you don't get too much inflammation. Managing inflammation, I think, is a better term than anti-inflammatory. Anti-inflammatory gives you the idea that you've got to suppress it. All the treatments in standard medicine are immunosuppressive and you know that that's one of the reasons why they can lead to things like lymphoma. They don't get rid of the process, but they suppress the inflammation, which sometimes is necessary to prevent damage because we said chronic inflammation includes tissue damage and tissue death in attempts at repair. You got to manage that, you've got to control that and try to keep it from going too far, while not suppressing all inflammation. That kind of approach is the last-ditch effort when other better methods have failed.

Shivan: Would an example of a good inflammation be a twisted ankle, and the body responds by swelling that area to help heal?

Dr. Sandberg-Lewis:	It's creating a splint.
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Shivan: Is that an example of good inflammation?

Dr. Sandberg-Lewis: Yeah. It's walling the area off, holding those inflammatory fluids in place so they don't go any everywhere and affect you in every way.

Shivan: That is very interesting because I think there's confusion to your point about inflammation in general. You get a high CRP blood test and you can tell your whole body becomes inflamed. Can leaky gut lead to systemic inflammation?

Dr. Sandberg-Lewis: Leaky gut or intestinal hyper-permeability is a big factor in most conditions that we're talking about in this program. It's caused by Celiac disease, it's caused by taking anti-inflammatories medicines, like ibuprofen on a regular basis. It's caused by heavy use of alcohol, many infections in the gut, yeast overgrowth, and often SIBO.

Many people who come to me with leaky gut ask if they should take glutamine and zinc and zinc carnosine. Well, I see that as putting the cart before the horse. First, I want to deal with the infections and the imbalances that are causing the leaky gut. I don't tend to just jump right into let's heal the gut.

Shivan: Right. So, do you think SIBO causes leaky gut?

Dr. Sandberg-Lewis: Yes, in most cases.

Dr. Mona Morstein: People don't understand SIBO, gastroenterologists don't understand SIBO. People think that it's just a gut infection and that if you just treat it with an antibiotic like a sinus infection that's all there is to it. My analogy to people with SIBO is say you're drinking dairy and it makes you all congested but you don't know that but you're getting congested from the dairy so as a result a couple of times a year you get a really bad sinus infection because mucus and dark and moist is great for bacteria. If you have a very bad sinus infection, say you need an antibiotic although naturopathically you don't need antibiotics to treat sinus infections, but even still that's

not really the disease. That's the end result of the disease. You've gotta clean up all the pain and infection but the disease is the dairy, right?

Dr. Morstein: It expresses itself as a, an infection so in SIBO the disease of SIBO is a lack of the small gut moving forward. For whatever reason and there are many reasons, as a result there's backwash from the colon into the small intestine and then those bugs overgrow, and they are presenting symptoms and then they are also damaging the lining of the intestine. So, with SIBO we do first have to kill the bugs. If you have a sinus infection and I'm saying well just take the dairy out I mean you still have pain, you can't bend over, we have to deal with the infection first. Once that's clear now we have to deal with several things. We have to deal with moving the gut forward. We have to deal with healing the gut lining. And we have to deal with healing the gut nerves, right?

Dr. Nandi: And this is something that a lot of people don't understand. People say, "Well, all bacteria is good. And all bad bacteria are bad." But the problem is that when you have an overgrowth in your small intestine, that's where you absorb your nutrients. If you've got a bunch of bacteria there, it's going to eat up your nutrients and produce gas and bloating and also cause some of the symptoms of diarrhea.

If it's in your colon, however, great news! If it's past your small intestine, great news, because then it doesn't cause the kind of problems that your patients with SIBO would have.

Dr. Ken Brown: The underlying cause is bacteria growing where it shouldn't be. It isn't that bacteria are good or bad, it's that they're just growing where they shouldn't be. Now we know that if you get labeled as having irritable bowel with constipation, you probably have more methane-producing bacteria. If you get irritable bowel with diarrhea, then the bacteria are probably producing hydrogen.

Dr. Ritamarie Loscalzo: First of all, I think it's an attitude thing that starts out because they've been told it's a bug, right? Its bacteria living in the wrong place, right? It's growing in their intestines. They come in with the mentality of we've got to kill the bug. That as long as we kill this bug that's living in my small intestine everything's going to be okay. And the truth of the matter is, as you know, it's way more than just killing off a bug.

Shivan: How serious is SIBO?

Dr. Siebecker: I think it's always serious in that it's a problem. It's a disorder.

It's not normal. We shouldn't be having this circumstance. But in terms of severity it has a spectrum. It can be mild. I mean, I still think it's serious because you have it but it's not fatal. It is not a fatal condition and it can be very mild. However, it can run the full spectrum and it can be very severe. So, people can have very severe. They can actually be disabled in terms of not being able to work from the symptoms. And others it's an annoyance.

Shivan: But it's a chronic annoyance.

Dr. Siebecker:	Not for everybody.
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Shivan: Really?

Dr. Siebecker: I know. We can learn about like how acute or chronic is it from this study that was done, the Target Three study. It was done on over 2,000 patients and they looked at that. They looked at how many resolved quickly or not. And what they found was one-third of SIBO patients resolve pretty quickly and two-thirds don't. The majority of SIBO patients, two-thirds, it's a chronic condition. But it is nice to know that there is that one-third and I have had the chance to see some of those people sometimes. And for them it can get resolved within months.

Dr. Mona Morstein: So, if a person is still having some distress after what would be considered an appropriate, well done, protocol where the patient was compliant, we have got to be looking at other obstacles to cures. You know, was a stool sample done? And how is it playing out when they eat? What about their gallbladder?

Have they been treated for candida or yeast overgrowth? We have to just try to figure out how is it happening, with what foods, when, and go back in time. What was going on in their life when this began. There are deeper levels for us to still investigate and find out with people; but here's one thing I also tell. I'm good with analogies. My analogy is that when we break our thigh, God forbid, there's a terrible skiing accident and you break your thigh. That is not healed from Tuesday to Wednesday. Right? You have to be in a cast, which you can see oftentimes, and then it may take 2 months, maybe 3 months. Then after that, maybe you need to do some PT and get a, you know, get it working again. The problem is we can't see our intestines, and so we're like, "I ate something and now I feel nauseous and ya know what? It's later that day! Why am I still nauseous?" Like if you just broke your toe, it's gonna be swollen in the morning. It's gonna be swollen in the afternoon.

So sometimes we have to be realistic with people and say, "When your gut is broken, think of it having to be in a cast, thinking of it having to heal. Then think maybe we need some PT. We need to treat it gently, and this can take some time." And so, people, because we can't see the insides, we're like, "I don't get it. I'd just been doing this diet for 4 days." Well, ya know, "Why am I not tremendously all better?" I'm like, "Well, did ya ever break a leg?" So, if some of it is expectations for how quickly the healing occurs and having the patience to allow it, but some of it is also some other etiological factors that may be going on.

Dr. Ruscio: The gut is an ecosystem, and there's more to that ecosystem than just small intestinal bacterial overgrowth as it is.

But where I start is essentially with diet and lifestyle. Step #2 would essentially be things like probiotics and enzymes. They're inexpensive. They're generally helpful. You don't need lab testing to apply those. And then, step #3 would be considering some kind of antimicrobial therapy—antifungal, antibacterial, anti-biofilm, antiprotozoal.

And then, one of the final things within the realm of the microbial step, we'll be potentially considering the elemental diet as a different method of antimicrobial. It does more than just antimicrobial, but that's kind of where I classify it.

And after that, we try to broaden the diet and try to support the gut with things like fiber and some probiotics—if they're tolerated. We do that very cautiously because it doesn't work for everyone. And I also layout in the book some indicators for, "Here is how to know that you are most at risk for a negative reaction from fiber and probiotics. And here's how to know if you are ready to probably proceed through the least risk from fiber and probiotics."

And then, we wrap up with trying to wean off any supplements—which is very important. The amount of people who come in with 15 things that they're taking is awe-striking.

Dr. O'Bryan: So, when you have irritable bowel syndrome, when you have small intestinal bacterial overgrowth, we don't focus just on SIBO.

Shivan: Right!

Dr. O'Bryan: This is the analogy. Just this one more concept if I may. When you have a symptom like SIBO, you've been diagnosed with SIBO, it's kind of like you've fallen over a waterfall, and you've crashed into the pond below. You swim up to the surface, and you go, "Thank God! I'm alive." You spit out the water, and you're trying to stay afloat in this pond of SIBO symptoms. You're trying to stay afloat.

But the water is really turbulent because the waterfall keeps falling into the pond. So, the water is really turbulent. You're still living the lifestyle that created the SIBO. It's a turbulent pond that you're in.

And everyone wants the life jacket. Everyone wants the life jacket, so they can stay afloat and not drown. And that's really important. So, we want the treatments for— What do we do for SIBO? We want the treatments for SIBO. We want the life jacket. And those with the least side effects possible are better, right?

But once you get a life jacket to where you're somewhat stable, you don't stay in the pond. You have to swim over to the side of the pond, get out of the water, walk up the hill, walk back upstream to figure out what the heck fell in the river that carried you downstream, and eventually, you fell into the pond of SIBO or irritable bowel syndrome.

So, it's the diversity of what's happened to us that determines what the diseases or imbalances are that we manifest with. So, you have to think about the diversity. You have to think about what's happening in my life.

Episode 2: Why Me? The Surprising Real Causes Behind Digestive Issues

Shivan Sarna:	What exactly causes SIBO?

Dr. Allison Siebecker: This is a big topic.

Shivan: It's a huge topic.

Dr. Siebecker: And it's something that so many people are confused about and they desperately want the answer. It's one of the most important questions because really for any condition because if we can figure out what the cause is, we can aim our treatments there and possibly get it cured, like really get it gone. I've researched this for years and it was complicated and so what I like to do is organize it into two categories—underlying cause and then risk factors which I would also call causes. So underlying cause risk factors which are also causes.

The underlying causes are when the body's own natural protections against getting bacterial accumulation in the small intestine, it's when they would fail. So those protections, those natural protections are hydrochloric acid of the stomach, enzymes that come out in the stomach but also the small intestine, bile that comes out of the gallbladder into the small intestine. All of these things can kill bacteria or arrest their growth. They're all there to decontaminate really the small intestine.

Then there's the immune system. Of course, we all know that the immune system works at fighting against bacterial invasion. And that can be both local and systemic. We can think about it that way. There's the ileocecal valve which is a physical barrier between the small and large intestine. The small intestine coming first and the large intestine coming later. So that prevents bacterial backflow from the large intestine because there's so many bacteria down there. But probably the two most important protections are the migrating motor complex and then just the normal anatomy of the small intestine. I'll take that one first. The normal anatomy, the small intestine is designed anatomically, structurally to have things pass through it. If something were to impede the flow, push on it or a kink or something like that in a tube then bacteria could back up as they're trying to move through.

And the migrating motor complex may be the most important of all. That is a form of peristalsis or motility that occurs in the small intestine but not when we're eating. We think of peristalsis as when we're eating food and moving that food down. This is different. This is when there's no food and it's all clear and we're trying to clear it. Dr. Pimentel says it's like when we wash the dishes after we eat. There's a little bit left on the plate and we're washing it off. There might be a little bit of debris left, now the migrating motor complex comes through and sweeps any debris and any bacteria, that's just one of its main functions, out of the small intestine down into the large intestine. It's vitally important. And it also provides a downward current. Imagine like a river flowing, a downward current against all the bacteria that are down below in the large intestine that might want to come backward and upward. If that fails, then there's nothing to move the bacteria out and we think that's the number one underlying cause—a motility disorder. And we think the second most common cause would be a structural problem. Some sort of compression, partial obstruction or various other things that could block the flow. So now, those are the underlying causes and it's very important to understand like structurally and functionally what could be wrong in the body to allow the circumstance to happen. But what most people think of as the cause is what I would call risk factors. And there are categories like diseases, drugs, other lifestyle things maybe like stress, genetics, surgery. And I said diseases already, right? Because that's probably the biggest category.

So, these are things that can occur to create those circumstances that I just mentioned. There are diseases that can create deficient migrating motor complex. There are diseases that cause structural anomalies. For instance, like cancer. A tumor can grow and compress the small intestine. A disease like scleroderma will stop the migrating motor complex in the small intestine. There are drugs that can slow the motility. There are surgeries that can come and adhesions which are like scar bands can grow and make a compression or maybe there could be cut nerves and we need the nerves to make that motility flow. There are a huge variety of circumstances that are of diseases and other things that are risk factors that can cause the underlying causes.

The causes being risk factors are vast, really vast. The underlying causes are a pretty small number both structurally and functionally. Kind of a complicated answer.

Dr. Mark Pimentel: I think there's a growing list of what SIBO can cause. So, when we talk principally about IBS and 60% to 70% of IBS is SIBO, there's also a whole bunch of SIBO that's not IBS-related.

So, if you have an obstruction of your bowel or an adhesion, that can cause SIBO. Diabetes, a chronic diabetic, gets impairment from neuropathy, and that can cause SIBO. Scleroderma, which is a really tragic disease, an autoimmune disease that impairs muscular function of the gut, that causes SIBO. And EDS, Ehlers-Danlos... there's many on the list that can cause SIBO.

The question is cause-and-effect. So, if you have an adhesion, the SIBO didn't cause the adhesion, the adhesion caused the SIBO. If you have other diseases like, for example, rosacea, there's some association that when the SIBO is there, it's triggering some immune response that's creating rosacea. It's incompletely understood how that works. But there are physicians who treat SIBO on the basis of making rosacea better. And dermatologists are doing this routinely.

So, what I say is I'd like to know what's going on before I get too down a particular channel. If you think of the thousands of bugs in the gut, they can produce a lot of what you can produce. And they can produce inflammation. And they can produce chemicals that can make you do things you're not supposed to do or don't want to do. And so, we're starting to unfold that. And when we do, then we'll be able to more clearly associate bug or pattern of bugs with disease and tackle it in that way.

Shivan: What's your approach when someone comes to see you and they may have a diagnosis of SIBO?

Dr. Steven Sandberg-Lewis: There are many different ways to have it. First, I assess whether it's hydrogen dominant, methane dominant or mixed and what the patient's symptoms and signs are. A lot of the treatments that we do are individualized. We might use a constitutional homeopathic treatment, or applied kinesiology to figure out which organs are more involved and which ones are doing better and then support the ones that need support. We might do psychological work. We might find out that somebody's IBS began when their son was murdered. When we ask about that it looks like it's still raw, so we have to do work with using emotional clearing techniques or homeopathy.

In terms of the overgrowth itself, we put a heavy weight on looking for the underlying risk factors. Why did the person get this? Frequently its they took tetracycline for three years as a teen for acne. That's so common. They're very likely to have a yeast overgrowth on top of it or LIBO or large intestine fungal overgrowth LIFO.

That's one of the common things we see. Or we'll see that they were born by caesarean section, so they didn't get lactobacillus at the right time. Then they weren't breastfed, so they didn't get Bifido Factor at the right time. We know that these organisms you're supposed to get within the first few weeks of birth and you're supposed to then mature your immune system in your gut with the presence of those.

If they're gone, we think things develop differently. I like to let my patients know that it's not that there's no hope, but if that's the case we have a harder job to do because the Peyer's patches and the other parts of their immune system in their gut may not have fully developed. They need those bugs.

We look to see if they had surgeries or did, they have a perforated appendix or an ulcer that perforated and caused adhesions? Adhesions cause right angle turns in the gut, gluing things together on the outside of these organs, affecting the flow. When you affect the flow, the migrating motor complex can't work properly and the bugs overgrow.

Did they take, or are they taking opioids, which stops the migrating motor complex? You really can't fix those folks. You can't help those folks until you find a way to get them off that medication and onto something else.

Dr. Ali Rezaie: If you think about it, the dysbiosis is not necessarily a primary disease... it's a secondary disease caused by an underlying dysmotility. So, if you fix the dysmotility, things will go away.

I mean the classic example is that a lot of patients on narcotics or opioids have bacterial overgrowth. Why? Because narcotics slow down the gut. It messes up the motility of the gut. And they get bacterial overgrowth. But when you stop the narcotics, bacterial overgrowth goes away by itself because now the body takes over, the small bowel takes over and kicks out the extra bacteria out of their body.

So, the most elegant way of treating all these diseases is to fix the underlying dysmotility.

Shivan: Let me just rephrase what you said. So, let's say I have some surgery. I'm on an opioid painkiller because my thigh was broken, God forbid, and it's fixed now. No more pain pills, right, but I could still have SIBO. Do some people's SIBO resolve automatically?

Dr. Rezaie: Yes.

Shivan: And some people don't.

Dr. Rezaie: Some people don't. And in those, we suspect that was some mild underlying dysmotility that was sitting there. And now, essentially, the narcotics tipped them over.

Shivan: Okay, just checking because if somebody is like, "I'm not a narcotics addict." Yeah, I know, but did you have a C-section, did you have some major surgery? This is where those narcotics that we usually don't even remember probably taking have a role.

Dr. Rezaie: Right, right... absolutely! Millions of surgeries are being done. And after that, obviously, you need some pain control. And a lot of people get the transient constipation and bloating afterwards, and then the symptoms just goes away. They don't even remember. But yes, there's always a percentage of people that that bacterial overgrowth persists and causes trouble.

Summer Bock: So, you know, the way that I look at it and the way I was trained to look at it is that you need to look at the symptoms instead of looking at these diagnoses. I think in Western medicine you're trained to name every single condition as if it's got like boundaries and like a little fence around it and an exact description. And that's not how our body works. I mean everything is literally connected and all the fluids and all the hormones. They're all communicating. Everything is connected and communicating within your body. And so, it's not neat and tidy. We look at symptoms and we look at the root cause and we deal with both. Because you want to help relieve somebody's immediate symptoms and herbs are really powerful at doing that. But you also want to make sure that you're dealing with what's underneath that. Why are they experiencing these symptoms? Because if you ignore that, you know, it literally is the band aid effect.

Dr. Gary Weiner: Those of us who are doing a lot of SIBO are getting a lot of cases where the patient has been treated many times and there are failures to respond and so that takes a certain amount of detective work. Usually there's some other obstacle, which can be many things, many different things that we then are busy looking for and having to treat a different pattern first or simultaneously in order to get

the SIBO to change, to reduce. Because I think many would agree that SIBO is really not always the trunk of the tree but a branch.

Shivan: It's a big branch.

Dr. Weiner: I think many of us when we started say oh here's a new trunk, but it turned out that the trunk was actually a branch. Sometimes it is a trunk. Someone has gastroenteritis and then they have a SIBO pattern that follows it.

Shivan: Maybe SIBO is the stump that's left over.

Dr. Weiner: Yes. The stump. I like that. It's the stump.

Dr. Nirala Jacobi: So, you can see here that the causes of SIBO are really, really crucial to identify because that's what's going to get you out of the basement. I usually say you're in a basement, and we need to kind of get you back in the kitchen stairs. You can see the kitchen light. And that is sort of the way out of the situation if you're not getting well with current treatment protocols.

Dr. Mona Morstein: Now, the damaged migrating motor complex is one of the most common reasons people develop SIBO, generally from a food poisoning episode, and the cytolethal distending toxins, and so forth.

When we have damage to the migrating motor complex or it just is malfunctioning, say it's not getting signals to move because you're on a PPI antacid, or it's not getting signals to move because you're not putting out bile, or you're not putting out pancreatic enzymes, or just other reasons it's not getting signals to really get started and move, we then have to help it move.

Dr. Mark Pimentel: One of the most common causes of SIBO is that the cleaning wave of the gut—otherwise known as the migrating motor complex, another term is housekeeper wave. They're all the same thing. But every 90 minutes, when you're not eating, there's a gurgling sound that you hear and somebody says, "Oh, you sound hungry" or you're embarrassed because you have that sound. First of all, don't be embarrassed.

Shivan: Don't! It's like, "Yeah!"

Dr. Pimentel: Yes, it's like the greatest thing to have because it's...

Shivan: "My migrating motor complex is happening."

Dr. Pimentel: It's the dishwasher. It's cleaning up your small bowel. So, you need that so that the bacteria don't build up on those debris and slime from the last meal.

And so not having that wave has been known for decades that it can cause bacterial overgrowth because you're not cleaning. And so, all that stuff is left there, and the bacteria start fermenting and growing, and they're very happy about that.

But the migrating motor complex can be measured. And one of the ways we measured it is with an intraduodenal manometry which is a tube through the nose all the way down into the small intestine under x-ray guidance. And then, you leave it there for six hours, and we measure it on a computer system.

Shivan: That does not sound like a fun test.

Dr. Pimentel: It is not a fun test which is why we reserve it for special patients who really need it. Eighty percent of the time, that's the cause of SIBO. So, we don't need to do it all the time because, more than likely, that's the reason for most patients. But in certain special situations where the patient is more severe or we really can't sort out what the issues are, we'll still do the test to be sure.

We have to understand that people have tragic life events, people have experienced abuse of various kinds, people suffer from anxiety, depression, addiction. There are many different psychological sufferings that go on. And as physicians, it's our obligation, our job, to identify all these aspects that influence a patient's care. So, those things are true.

What's not true or has been shown to not be the case is that the notion that IBS was caused by that is apparently not very clearly true.

So, we should address all those problems. We should enforce or at least encourage psychological help for patients who suffer from these conditions. But that is not going to make IBS better. And it's not the cause of IBS.

And let me tell you why I know this now. It's because the US military has tracked the deployments to various warzones. And they come back with IBS, these troops. After one deployment, there's a very high rate of irritable bowel syndrome. And they looked at whether you discharge your weapon, were you were in active combat or sitting at basecamp on a computer, whether you witnessed or observed psychological traumatic events—human death, human suffering. And none of those predicted the development of IBS. The main predictor of the development of IBS was did you get food poisoning when you were deployed.

Dr. Pimentel: So, they can be cofactors, but they are not primarily or principally the trigger.

I would say, as we move forward, we now know for at least the last couple of years, that food poisoning is a trigger for IBS—which I've already stated. But I want to state it even more clearly. I think now, in IBS, we know more about the trigger event than we do for Crohn's or ulcerative colitis which is a major thing for this disease because Crohn's and ulcerative colitis has received almost all of the funding from federally funded grants. IBS generally doesn't get much funding.

So, it's a huge leap for this field, a huge leap for 45 million Americans, one billion people worldwide who have IBS.

Dr. Ali Rezaie: So, a lot of times, when you get food poisoning, it's just two or three days of vomiting and a little bit of a stomach upset or a little bit of runny bowel movements. And then, you're like, "Okay, that was the worst vacation ever." And then, vou come home, and everything goes the way it was. But in about 12% of the times. that's not how it goes. The bacteria goes away, but you still continue to have a lot of symptoms—symptoms including changing bowel habits, abdominal bloating, distension, abdominal discomfort, nausea, early satiety and changes in weight (whether weight gain or weight loss, either way), and food sensitivities (food that you could eat three months ago, now you can't tolerate). So, all those symptoms can linger and go, not just for months, for years-and sometimes, forever. And that's a phenomenon called post-infectious irritable bowel syndrome. Although we knew about it, we didn't know what causes it and what array of pathophysiologic steps occur until you get those symptoms. And because of that, the treatment was essentially all over the place because whenever you don't know what's causing the disease, you're just shooting in the dark.

So, whenever you pick up an infection with a gram-negative bacillus—gram-negative bacilli are the bacteria that are the most common causes of food poisoning. So, in the US and Canada, it's Campylobacter jejune. In Mexico, it's E. Coli. So, there are many of them including Shigella, Yersinia, Salmonella, stuff that you hear a lot on the news that sometimes, "Oh, warning! X and Y avocado or lettuce or poultry is contaminated with this." And obviously, with that, comes a lot of food poisoning.

All these bacteria have a protein that is stable. And it exists in all of them. It's called **Cytolethal Distending Toxin or CDTB.** So, I'm going to refer to that as CDTB because, really, that long name doesn't really matter. So, they have a protein inside them called Cdt that the main part of it is CdtB.

So, just like any infection, when you pick up those infections, you develop antibodies. And that's normal. When you pick up a flu, you develop antibodies against that virus. That's normal. But these antibodies that are circulating in your body after an infection interact with another protein in our body called vinculin. And your body produces now anti-vinculin and because of molecular mimicry. The proteins look similar, so they attack each other.

Dr. Rezaie: So now, you have anti-vinculin. But the problem with antivinculin is it's an autoantibody. So, they're different. So, when you develop antibodies against an external extruder, that antibody dissipates slowly because your body forgets about it. There are memory cells in our body. They forget about it. Oh, 10 years ago, I got exposed to these bacteria, forget about it. I just stopped producing this antibody. But when you have autoantibody, there is a constant supply of that protein in your body because it exists in your body. So, those memory cells constantly get activated. And you produce anti-vinculin, so it doesn't go away easily. So, when you have anti-vinculin, it affects the vinculin function in our body which, one of the functions is how your small bowel and also the rest of the gut moves. There are smooth muscles. There are muscles inside your bowel. And there are nerves that feed them. So, it has its milking movements which is called peristalsis. So, when those are affected, then the movement of the gut doesn't happen well. So, by itself, it can cause a lot of trouble. Now your bowels are not moving well, so you have a little bit of a cramp, you have a little bit of bloating. Suddenly, you don't feel good. You feel constipated. Sometimes, the movement is so erratic, you get diarrhea on the other side.

But on top of it, peristalsis of the GI tract is critical for bacterial composition inside the gut because that's how its controlled. Our body doesn't have antibiotics; it has peristalsis. It moves things. So that's how it controls the bacterial population. Think about it, there are millions of bacteria per ml in your mouth. There are trillions of bacteria in your colon. All of a sudden, in between, in your small bowel, there is this island of relative sterility with less than 1000 bacteria per ml, per cc, sitting in there—which is fascinating if you think about it, how our body controls this and putting a lid on bacteria growing in this small bowel. And that's done by peristalsis.

So now, the peristalsis doesn't happen. What happens is that the bacteria in the small bowel become abnormal. They overgrow. There are a lot of them. And that causes trouble. Why? Because now when you're eating, instead of you digesting the food, the bacteria digest the food. When bacteria digest the food, they can produce whatever they want literally.

That's what I tell my students and fellows and post doc students, that bacteria can produce anything that they want. We know that they produce estrogen, progesterone, testosterone, serotonin, histamine—and even the usual side products that they produce when they ferment, the same way that you brew beer. They produce gas—hydrogen, methane, carbon dioxide, hydrogen sulfide, all those gases that get produced and obviously lead to abdominal bloating and distension. And those other side products that they produce cause a lot of other symptoms as well that we know of and we may not know about.

Dr. Rezaie: And that's probably the relationship of all these diseases that we're finding these days as you mentioned before like Parkinson's disease, Alzheimer's, even depression, fatty liver disease, abdominal distension, the whole array of diseases that may be associated with this.

So that's what we're working hard on with multiple different medications, taking the antibodies out, putting another type of antibodies to take that antibody out. So, there are different ways that we are looking into it, even suppressing the cells that produce that antibody.

So, those are the ways that we are trying very hard to suppress and work on to see which one is working.

Shivan: Okay, just antibodies are good for us, aren't they? But when they go crazy, they're not?

Dr. Rezaie: Yes.

Shivan: Okay.

Dr. Rezaie: So, think about it this way. So, when you get a vaccine for tetanus, it's circulating in your body doing nothing to your body. But then, when you go camping, and then you get caught by a rusty nail, and then those antibodies detect that tetani microorganism, then they attack it and kill it. And then, you don't get tetanus which is universally almost fatal.

So, they are good. But antibodies, if they attack your body cells, that's where the problem happens.

And unfortunately, there's so many proteins in the world. There are trillions of different types of proteins. And there are bound to be some similarities. And when antibodies are circulating, and they attach that specific receptor, they may get confused and attached to something that is similar, the body gets confused and produces antibodies.

And that's where antibodies, all of a sudden, become the enemy. And that's one of the mainstays of pathogenesis of autoimmune diseases.

And that's where a lot of research going, to suppress those type of antibodies—not just they attack other things that are bad for us, they attack our cells. And in fact, some of them only attack our cells. So those needs to be stopped.

Shivan: So, you just did a beautiful job of describing SIBO and IBS as an autoimmune issue and the slowing down and the malfunction of the migrating motor complex. And that's how that all ties together.

Dr. Rezaie: Right!

Shivan: So, when it comes to food poisoning, you must see it all the time in your practice, that people with SIBO and they haven't connected the dots back to a food poisoning episode/s.

Dr. Melanie Keller: Well, of course, because let's just face it, I'll say the diarrhea folks might always have diarrhea, and constipation folks might go, "Yes, some loose stool!" and celebrate what was actually maybe a food poisoning.

And not all food poisoning is bacterial. So, we have to acknowledge that too. So, I'm acknowledging parasites and viral and gastroenteritis as well.

Shivan: But it's the bacterial food poisoning that can cause post-infection or post-infectious IBS that can be an underlying cause for SIBO, right?

Dr. Keller: Right! It's the top culprits, that they all release the same toxins—and I always say it's a mouthful—cytolethal distending toxin-B or snuffleupagus. But B is the thing that you remember as maybe not that bad or such, but it's one of those things where, "Oh, interesting. If they all release that, and then our body gets confused and says, 'Uh-oh... I'm going to overreact to that too.'" And it can intervene with our migrating motor complex, or at least that motor complex nerve

that's helping that action happen, then that's some really important information to know.

And I think that, in the past, people haven't—maybe they're really banking on saying, "This is my answer." And in some cases, it really is. And then, sometimes, it's inconclusive or not quite clear which is really—you know, that can be not great. But at the same time, you might also want to pay attention to the numbers that the antibodies are even there because that might be giving you more of a message as well. So that's the importance of being aware of it.

Shivan: What are those antibodies called?

Dr. Keller: Well, that would be the anti-CdtB—I'll just keep it short on that. That's the abbreviation of the word of the toxin that's released by the bacteria— and then anti-vinculin antibodies. So, these are both antibodies that our body can say, "That's not self. What's going on here?"

Shivan: Right! So, you're going to react to it. Okay. So, when you have these antibodies, and then there's confusion in the small intestine, and the migrating motor complex is impacted (so you're not going to have that sweeping motion), then your motility is affected, right?

Dr. Keller: Right! And so, your kind of going, "Alright, I'm gargling, I'm doing this, I'm spacing my meals, I don't have gum." You're doing everything right, agreed. It's not you; it's the fact that you don't realize you might just be skipping the record.

And if you have this test, you would know why—including maybe even doing the treatment you're doing because, sometimes, based on those antibodies and the height of the antibodies, it might even give the physician an indication that "You know what? One round of Rifaximin just isn't going to cut it." You might shrug your shoulders kind of, "Eh..." But maybe the next round or let's make sure on your next trip, on your next cruise, that you're also taking preventative measures to prevent food poisoning.

Shivan: What's a good preventative measure?

Dr. Keller: Well, for example, the Xifaxan can be dosed just to 550 mg. It could be once a day. It could be half of a tablet a day. It really depends on your doctor's decision and your history.

Some people might be traveling, or they're in a SIBO flare and they want to travel, they've had it on the books—that just happened to me this week with a patient. So, I said, "Let's do your therapeutic dosing, meaning three tablets a day for 72 hours, see how much that helps your symptoms. And then, reduce that down to your maintenance I'm-traveling-in-the-Bahamas dose."

Dr. Gary Weiner: I think many people with SIBO have other health problems and it's good to look at them all at once and not be so SIBO specific. I know your

documentary here is on SIBO so of course we're going to be SIBO specific, but to look at SIBO in the context of other metabolic issues.

Shivan: Well, that actually happened to me in that I thought oh I finally got the diagnosis, SIBO 24/7 365 was on my brain and I'd done all these approaches and then it turns out I have Lyme and all of a sudden, it's just a totally different approach while I'm still trying to treat the SIBO. It's a place that if you hang out there too long it can lead to missing other things because I just had my blinders on and was only looking at SIBO.

Dr. Ilana Gurevich: If you have a SIBO test and I'm treating you and I'm doing everything right and I've done this a thousand times and you're not responding, your numbers are not improving, your symptoms are not improving despite the fact that we have been through phase one and two, maybe multiple times, I'm thinking there's something else going on. When I'm thinking there's something else going on, I am more likely to start looking for parasites. Other people who have a different population are going to look for systemic viruses like Lyme or Epstein Barr or some of those chronic viruses.

Dr. Nicole DiNezza: A lot of people in one of the SIBO forums have been talking particularly about the Epstein Barr virus, the virus that causes mono. And there's been a lot of chatter on those forums for the last year or so about this topic, and it made me look back at some of my case files and think about how I treated some of my patients.

And I do think that they could be related. I don't know if it's a strong enough link and is this enough to say that if you have a viral infection like Epstein Barr, I don't know if that would cause SIBO or it would cause inflammatory bowel disease.

But I have a reasonable hypothesis of how those could be linked. And it's mostly by what viruses do to the body, mainly the immune system.

So, viruses, like every bug, they want to survive. So, they can literally hijack our cells. They get into our cells into the DNA and manipulate how our cell function, what kind of proteins they make, what kind of cells they become. And that's where things get really squirrely really fast with the virally infected, is that all hats are off if the virus is on the table

because you don't know what their DNA is doing to your DNA and what they're influencing your cells to do.

Some of the things that are really well-studied is that viruses tend to shift the immune system away from cells that are good at fighting viruses. So that would favor their own survival. Some of you guys might have read about this on autoimmune blogs or you might've come across the concept of TH2 and TH1 balance. And there's usually these two cells that are drawn on a little seesaw. When one goes up, the other one goes down and vice versa. So, you only really get to have one of those around at once, at any given time.

Dr. Farshid Sam Rahbar: First of all, the word Lyme has become a cliché. Everybody uses that. But there's a lot more detail involved with it. And generally, the word Lyme

involves a description of the original disease, that the patients develop some sort of bull's eye rash and acute illness. And the term Chronic Lyme still does not have an ICD10 and is not recognized across the board by all physicians and authorities. That work is still in progress, but I think I like to use tick-borne illness, sporidiosis, to make it broader.

And as we learned, we noticed that the infections are just not one. You could have Lyme bacteria, but that may not be the bigger player. There may be another player in the background that makes the person susceptible to SIBO as a presentation, if you will, and other variety of symptoms.

Based on what we have seen with the patients—we have had patients who clearly had documented disease. And when you talk to them, maybe 5% recall a vector that might have bitten them. And I don't think you need necessarily a tick. I think many vectors may transmit the infections. I think to try to discipline it only to a certain, specific bug that's classically described, it may not be the real scenario. It means that these infections can be transmitted by other bugs

The other scenario is that at least based on what the patients told us; I would say maybe 5% recall a vector bite whether it's tick—

Shivan: What's a vector?

Dr. Rahbar: It doesn't have to be a tick. I actually think, for example, from what I've been seeing and reading, that fleas are much more dangerous and responsible for transmission. And the Bartonella is one of the illnesses that has significant resemblance to Lyme (with some differences). It's a huge player and it has significant digestive manifestations.

Shivan: What are the tests and what are the labs that you suggest or recommend?

Dr. Rahbar: You know this area is quite controversial and there are different schools of thought between traditional infectious disease and physicians are what we call Lyme literate, or they're trained by the International Society for Lyme and Associated Diseases. But generally speaking, the key issue is first a good history. It's very important to look at the risk factors we just talked about. In our population, many of the patients have been women with a European background and also who are athletic and outdoors or have had pets or lived in areas that are bushy and beautiful, but the beauty comes with a price. So that's the first.

The second thing, as far as, testing if the financed are limited I usually go through a regular lab such as Quest and LabCorp. And we have occasionally seen positive results from that.

And in just the last two weeks we had two patients who came with a chronic model of illness and they were clearly positive under LabCorp testing which we're going to use those two cases as an example that yes, a regular lab may be able to pick up the chronic model as well. You don't always have to have an acute picture. But in the

statistical analysis that we did and again this is a small office, we looked at our own data. Only about 8-10% of the patients were picked up by regular labs. So we can do this step by step, or if the finances are not an issue, one can go to more expensive testing and those laboratories may or may not accept insurance for the same reason your insurance companies may not consider the results of those labs as medically necessary or they may consider investigational. I am not here to take anybody's side, okay.

Dr. Tom Messinger: So, Lyme, technically, is an infection with a spirochete named Borrelia Burgdorferi. The reality is Lyme is a lot more than that. There are multiple infections, multiple toxins that people are exposed to that contribute to the whole picture of Lyme.

It definitely can be a cause of SIBO. The Borrelia spirochete that causes Lyme has an affinity for the GI tract. And it has an affinity for things that affect the GI tract. So, a lot of people are aware that Lyme disease can cause neurological symptoms. And a lot of your SIBO listeners are aware that there's a very strong brain-gut connection.

So, Borrelia definitely can affect the brain. And through its affinity with the vagus nerve can have a strong impact on the GI tract.

Borrelia does have an affinity for the vagus nerve. And so, it can impact hydrochloric acid secretion, pancreatic enzyme secretion and gut motility.

And Borrelia does also live in the cells of the GI tract. So, the migratory motor complex is in the cells in the small intestine. And there was a study done on pediatric patients who were suffering from chronic gastrointestinal issues. And they were trying to get to some underlying cause as to what that was. And so, they did endoscopies on these patients. And they did biopsies of tissues of the small intestine. And what they found is 70% of those patients had Borrelia burgdorferi in the intestinal cells.

So, Borrelia has, like I said, affinity for nervous system tissue. So, it's very likely affecting the MMC also. So that's one thing.

There's also other published research showing that a manifestation of acute Lyme disease when a person gets a tick bite and gets an infection from it can be a GI presentation. So, the study said that one of the ways that a person can manifest Lyme disease acutely within days of a tick bite is they have nausea, vomiting, diarrhea, abdominal cramping.

So, a lot of people with SIBO have had a history of what they thought was a GI flu, just some common GI organism or food poisoning. And they chalk it up to that because that is the same symptoms that a person will experience as with possibly acute Lyme—nausea, vomiting, diarrhea, abdominal cramping.

So, they eventually develop GI symptoms that have become chronic. They go on to seeing multiple practitioners, they get diagnosed with SIBO. And they might be getting treated with very good protocols for SIBO. But they might either be resistant to
treatment and not improving, or they might have gotten rid of the SIBO just for the SIBO to come back despite very good prokinetic therapy.

So, that's a trigger in my mind to think how. Was it actually Borrelia that might have initiated this process to begin with or might be co-existing with the SIBO?

So, that's a little bit of a digression. But that's how Borrelia can impact the GI tract and be a cause of SIBO or be contributing to a person's GI symptoms?

Dr. Jay Davidson: The gross factor is of course always on the agenda any time you talk about parasites. The reality is, if you have parasites—and as my friend, Dr. Todd Watts would say, a quick test you can do to see if you have parasites is take two fingers, find your pulse. And if you feel a pulse, that's a positive sign for parasites. And I'm like, "Yeah, that's a pretty good test actually. I like that." So, some of the engineering types might not appreciate that. But it really goes to show you how many people actually are being affected by parasites.

So, the connection with why parasites are so needed, whether somebody has SIBO or any other health issue, parasite cleansing usually needs to be first on the docket for one main reason. Parasites are a protector of other bugs.

Well, actually, there are multiple reasons. So bacteria (like Lyme disease is a bacteria) has been shown to live inside of nematodes (which is a type of parasite); viruses like Epstein Barr lives inside of parasites; mold spores—So, let's say somebody is exposed to toxic mold with the hurricane stuff that we've had happened the last few months— Harvey in Houston and stuff like that—the real damage is the chronic illness of mold in the water damage. And so, let's say you're in a moldy house or a moldy work environment, you're getting sick, you move, you relocate, or you're able to remedy the mold 100% and you know it, but you're still sick with mold, mold spores can live inside of parasites. And then, the spores can be released from the parasite and keep making you mold sick even though your environment is safe and clean.

And then, the last thing to consider is that parasites are a sponge for heavy metals. So, if you have high lead, mercury, arsenic, cadmium, aluminum, lead (if I didn't say that already), parasites will absorb that. So, your body will say, "Hey, parasite, you're helping me out with this heavy metal toxicity burden. You're a sponge. You're absorbing it." So, the body's more likely to actually keep parasites around if you have high heavy metal toxicity because it's a way to protect the body in the moment.

So, in order to detox heavy metals truly, you got to clear parasites out, so the heavy metals can actually be released to grab on, to remove them. Otherwise, you can't detox them out of a living parasite.

If you have chronic Lyme disease or other pathogen issues and viruses or mold toxicity, you got to clear parasites out. And I really believe, in order to truly heal the digestive tract, those upstream sources, whether it's biotoxin illness like mold or Lyme or heavy metals, they have to be removed because otherwise it's always a downstream stressor on the gut, but also, a direct stressor, I find really to be parasites.

Dr. Davidson: A couple of things that we've seen as far as when you clear parasites out, the "SIBO diagnosis," we've seen that disappear many times. So, is all SIBO parasites? I don't think so by any means. I don't think anything is like one way or the other of course. But when you see SIBO go away from clearing parasites, then it makes you wonder how many of the cases have this as a factor. And parasites are known to clog things up, right? I mean, for somebody that doesn't move the bowels well, constipation, that's a classic parasite sign. And I really believe what we think of parasite-wise, we're thinking third world country, right? I drank some water, I have profuse diarrhea, I'm about to die, I'm dehydrated. Very few of the parasites actually do that in America. And parasites don't know borders. They're everywhere. They're in our water supply, they're in our food, salad bars. It's kind of gross, but when you sneeze, you can literally sneeze out ping worm eggs. So, if you think air, food, water, parasites! So, they're all around us.

So, it's not a question really of "do you have them," it's "how much." And if you never really parasite cleansed before effectively, you're probably going to have a big build-up. So, you want to clear that down. And then, just think about, periodically, doing some parasite cleansing. Maybe every spring and fall.

It was kind of the old farmer's thought process, right? Every spring and fall, we're going to parasite cleanse the animals. And they would also do the family back in the day at the same time. Do it all! And somehow, our tradition kind of lost that.

So, I think every six months, do a parasite cleanse. If you see some stuff come out of you, continue. If you don't, wait six more months and do another quick parasite cleanse. I think that's just a good protocol to think of.

Dr. Rachel Fresco: When you have dysbiosis in the gut, you have either too much of the right ones in the wrong place (as in the case with SIBO), or you might have pathogenic or bad bacteria in the mix as well, there's always the potential for yeast to be a cofactor, right? These bacteria like to recruit different friends to their party in this biofilm. And so, there's anaerobic and aerobic bacteria and fungus. And they all live together in the biofilm.

So, we know that Candida can be a big player and could cause perforation of the got lining. If you look at the slide, you'll see those little hyphal heads that come out. You can imagine how those are like poking through the lining of your gut, another cause of leaky gut. So, our guts are assaulted from so many different things. I mean, of course, there's GMO foods that contain high levels of glyphosate. That's been shown to cause leaky gut. There are things like Splenda that, for some reason, causes leaky gut.

So many people think "Oh, I'm going to diet. I'm going to have this Diet Coke" or whatever. But they could be making their gut situation much worse. So, I don't

recommend people use any artificial sweeteners at all. I think Stevia or just things like that are better in general.

Shivan: Okay, I want to dive into this word or this acronym, LIBO. SIBO is small intestinal bacterial overgrowth—people say a little bit of a variation on

that—large intestinal bacterial overgrowth. So often, we're just obsessed with this small intestine. How does the large intestine and this LIBO play into it?

Dr. Nirala Jacobi: So, that's a really great question because when I first heard about SIBO, that was sort of, for me, the missing link of much larger issue of digestive disorders. And for us, the gut doesn't stop at the end of the small intestine. It just has a whole other area that is actually the home of the microbiome. Your large intestine is the host of trillions of bacteria. So, it makes sense to not forget about the large intestine in the scheme of digestive disorders.

So, LIBO is really just a more current term for something that naturopathic doctors and natural health practitioners have called **dysbiosis** for many, many years. And dysbiosis basically means where you have bacterial imbalances in the large intestine. So that's kind of how that came about.

And we've been treating LIBO for a long time before SIBO ever came along.

Shivan: So, how do you test? How do you determine what's going on there?

Dr Jacobi: So, most of the time, I do a stool test that involves sampling the poo and looking at not just what's growing there and what's not growing there, but also at other markers that look at the function of the digestive tract. That can be something called pancreatic elastase which is a marker for how well the pancreas produces digestive enzymes; also, short chain fatty acids which are the end result of bacterial fermentation and are very, very beneficial for us (when they're in the right location of course). And then, I look at the bacterial distribution. And what that means is I look at if we have too many methanogens-not we, but the patient-maybe methanogens or sulfur-reducing bacteria called desulfovibrio. And that's done by what's called a PCR or polymerase chain reaction. And that's just a fancy word for that the DNA of bacteria was tested rather than a culture was done because a lot of stool tests still involves culturing the bacteria. But with that method, you can only ever catch what are called aerobic bacteria, bacteria that grow in air in a petri dish. But the majority of bacteria in our large intestine is actually anaerobic, meaning that they die when they're exposed to air. So, we do that with a different method called PCR.

So, once I get those test results, I can see if somebody has a really high level of desulfovibrio, for example. I know that they are over-producing hydrogen sulfide in the large intestine which then can cause a lot of constipation actually. So, hydrogen sulfide is in competition—or sorry, hydrogen sulfide is produced by these sulfur-reducing bacteria that are sort of in combination with methanogens. But they can both produce constipation in the large intestine.

And then, **I also do Organic Acids Testing. And I use Great Plains Labs**. I like them a lot. And Organic Acids Testing is really an underutilized, wonderful test that can help you understand if you have SIFO or—well, fungal overgrowth. We don't know if it's in the small intestine or the large intestine. That's the caveat with Organic Acids Testing. It doesn't really compartmentalize as to where the bacterial overgrowth or where the fungal overgrowth is. But it's a good test, I believe, for the diagnosis of Candida because you can't really diagnose it very well because stool testing, if it's negative, that doesn't mean it's actually negative because Candida loves to live in colonies. And if you just sampled an area of the stool that doesn't have it in it, you just missed out on actually being positive on the test for that. So, Organic Acids Testing is great for identifying fungal overgrowth and how severe it is. It looks for a marker called arabinose which is a marker to look at invasive yeast species. So, it's a good one to look for.

Dr. Jacobi: I'm just fascinated practitioner. I'm fascinated by the microbiome. And I think we do ourselves a disservice if we just look at the small intestine, missing out an entire section. Granted, SIBO is a real thing. Let's not forget about that. But dysbiosis or LIBO is also there that we need to address.

Dr. Sandberg-Lewis: There are a lot of underlying risk factors and, as you and I have talked about before, there's Ehlers-Danlos Syndrome. Five percent of the population has that. Up to 45% of the population in some African tribes, but 5% of Americans. The joint hypermobility type of Ehlers-Danlos syndrome, leads to all kinds of symptoms of IBS in folks that have it.

Shivan: What are a couple of signs to help somebody figure out whether or not they have that syndrome?

Dr. Sandberg-Lewis: The Beighton Scale, which you can Google, but we'll show you right now, has nine points. If you have five or more points that's a positive Beighton Scale for Ehlers-Danlos. The first one is seeing how close you can get your thumb to your wrist. You get one point for each of those. If you can oppose your thumb to your wrist, each side one point.

The next is to fully extend your elbows. Some folks have hyperextension. If it's 10% or more that's one point for each side.

Shivan: Ten percent or more. I don't know how to really gauge that.

Dr. Sandberg-Lewis: It takes a little looking, but yours is definitely beyond 180 degrees by a little bit there. How's your other one? I would probably give you one point for your right arm.

Then we have people fully extend their arm and pull their last digit toward their head and if that goes more than 90 degrees that's one point for each side.

Shivan: Okay. Like this?	
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Dr. Sandberg-Lewis: Yours doesn't seem to go beyond 90.

Shivan: Oh good.

Dr. Sandberg-Lewis: Then we have the person stand up and fully lock their knees back, fully extended their knees and if they hyperextend ten degrees or more that's one

point for each side. Lastly, we asked them with their knees straight, not bent, to see how close they can get to touching the floor with their palms. Some people bend over and their palms go right to the floor. These are the folks that either teach yoga or they start yoga and the first day they make everybody look terrible, but they have joint hypermobility.

They'll say, "I'm always spraining or throwing my ankle out. My shoulder is always coming out of joint. These folks tend to have prolapsed colons. I've recently seen an x-ray of a patient with a prolapsed small intestine. Their entire small intestine, on barium study, was in their pelvis. It's supposed to be abdomen and a little bit in the pelvis, but the whole thing was down in the bowl of the pelvis, which is not good for motility. They also are more prone to have sliding hiatal hernia, and to have an open ileocecal valve, which is a big risk factor for recurrent SIBO.

We do screening on all of these things and ask all kinds of questions. There are other medications that predisposed you to SIBO, but those are the major ones. We get a sense of... What can we work on? What can we fix? What can we improve and what can't we? It depends on if you have a combination of four things and two of them, we can't change. We're going to treating their IBS, maintaining their improvement over a lifetime. Any case of SIBO you're trying to prevent recurrence, but in those cases, you're really going to have to be more active.

Shivan:	More	managing	it.	Tell	me	again	the	name	of	that
syndrome?										

Dr. Sandberg-Lewis: Ehlers-Danlos.

Shivan: How do you treat that? Is Ehlers-Danlos treatable?

Dr. Sandberg-Lewis: We're just starting to figure that out. There are some folks that have come up with treatments. It's too early for me to know how well those work. One thing I would tell you right off, I am a rolfer, so I'm used to doing deep tissue work, releasing adhesions. I don't do that for the gut I send patients elsewhere for that because it takes hours. I don't think that you can do standard myofascial release on folks with Ehlers-Danlos, especially on their joints, and get the best results. They need prolotherapy and platelet rich plasma injections to stabilize their joints and other tissues rather than make them more elastic. Folks with Ehlers-Danlos have a different kind of collagen that makes up their tissues holding their body together. It's floppier, it doesn't have the same integrity.

Larry Wurn: In talking about adhesions and their relationship to SIBO, we're really talking about obstructions in the body—that is to say adhesive obstructions in the body. How adhesions form inside or outside the loops of the bowel, squeeze it shut, slow the passage of food perhaps, but also slow the exit of treated bacteria from the body.

So, when we're talking about adhesions in the bowel that affect your response to medications that your physician has prescribed for the SIBO, we are really talking

about bowel obstructions—that is to say adhesions are obstructing the passage of food or the passage of treated bacteria out of your body.

Dr. Leonard Weinstock: Okay! So, we have this particular white blood cell that normally lives in precursor cells in the bone marrow. And you don't get it in your bloodstream unless something happens. It comes out normally when there is inflammation or injury, burned or broken bone. And then, that stimulates activity in the bone marrow to manufacture these white blood cells called mast cells. They travel to those interfaces.

And so, if you have inflammation in the small intestine, the dendritic cells are going to activate and send a signal to the bone marrow to get the mast cells to the site. And sometimes, it's good. And sometimes, it's bad. It kind of depends on what type of mast cells you get there.

And the mast cells that many people who are suffering from mast cell activation syndrome for decades and decades are ones that have gone under genetic mutations in the bone marrow. And so, these mast cells come out, they live in the tissues (which we'll talk about) and they can live for months to years there, creating havoc.

Shivan: So, is it kind of like when someone has an allergic reaction, it's an over-reactivity of something that's an immune response? It's usually good, but then it goes over the top.

Dr. Weinstock: Indeed! Think about these individual areas. And so, when I look at a patient, I'm looking at their eyes, their noses, their mouth. I'm looking at their skin, talking about asthma, hives, chronic eye irritation, ear irritation, ringing of the ears, vertigo. And then, we're looking at the muscles in general, constitutional aptitude with regard to fatigue.

Shivan: Okay, let me just ask you one circle-back question. Which came first, the inflammation or the mast cell activation?

Dr. Weinstock: Okay! So, the chicken in the egg is a fabulous question always. We don't ask that question enough. So hopefully, we'll have time to bring that up at the SIBO conference. We always have to look at the underlying cause for SIBO. It's not enough to tell a patient, "Oh, you've got an abnormal breath test. You've got irritable bowel, bloating and gas. You have SIBO." That's not enough. So you have to look for the three or more causes for SIBO to say, "Okay, this is something that we can try to correct"—if it's a motility disturbance, if it's autoimmune, if it's anatomical, if it's adhesions and so forth.

But I am doing research now that's going to look at the incidence of small intestinal bacterial overgrowth (SIBO). And my preliminary study shows that 47% have abnormal breath test who have mast cell activation syndrome.

Shivan: Okay. I have several questions as you can imagine. How do you test for it? And how do you treat for it?

Dr. Weinstock: Okay, excellent! So, in terms of making a diagnosis, you look at two major criteria, and then there are five minor criteria. So, the two major criteria would be the symptomatology in two or more organ systems that are classic for mast cell symptoms. It could be asthma, it can be irritable bowel syndrome, it can be hives and itching. Let's see, there are three systems; and then, biopsy proof of excess mass cells in the gut or bladder—not in the skin interestingly enough.

If you have hives, and you do a biopsy, you're not going to see mast cells. You might see it in other mast cell diseases which are rarer like mastocytosis. But we're talking about an extracutaneous phenomenon, namely the mast cells are somewhere in the gut... you eat shrimp, and guess what, you get hives because histamine has been released by your gut mast cells, and that's causing hives. So that's what happens—or anaphylaxis. So, anaphylaxis is a big one.

Dr. Weinstock: So, there are many treatments. **First, you look for triggers. You perhaps get away from the mold or remedy your household.** And then, they have a lot of things going on with mold. Many things are new to me, but I'm learning.

You look for other triggering aspects. So, a number of medications that you might be taking actually may be making you sick because mast cell patients have a lot of allergic-type responses, so reaction responses, to the excipients, mainly the fillers. It could be lactose, it could be soy, it could be food dye colors in...

That's why some patients do well with ranitidine, and some do well with Pepcid or famotidine. But some need to go to a compounding pharmacy to get pure famotidine mixed in almond oil or water and to get it that way.

Shivan: What's Famotidine?

Dr. Weinstock: Famotidine is Pepcid. It's over the counter. So, believe it or not, you can get a lot of yardage with H1 and H2 blockers. So that would be the ranitidine, Pepcid, H2, that you take for heartburn and in combination with H1 blockers. So that is the short-acting Benadryl type medicine. So that would be—I can use names—Claritin, Zyrtec, Xyzal or Allegra for instance.

So, a good H1/H2 blocker is the first step because what you're doing—one of the big components, proteins, that comes out of the mast cell is histamine. And it's not just for the itchy person. You can think of that histamine itching. But histamine is a nociceptive protein. Nociceptive is pain. And so, if you can block the histamine receptor, you can reduce pain. So, that's step one. **That's step two in a way.**

Step one is the diet and the environment. So, you look for allergens in your diet and in your food. A number of patients will do well with a gluten-free diet, wheat-free diet, yeast- and dairy-, protein-free diet. So, I test those out.

And then, I have them look at their meds and say, "Okay, when you introduced this med for depression or for whatever, did your symptoms get worse?".

Think about the medications you're taking: "Question: Could there be a filler that I'm allergic to?" So, controlling that is important.

And then, stress also activates mast cell. So, learn yoga from Shivan and go back to your tapes or whatever you're doing.

Shivan: Namaste.

Dr. Jacobi: I really urge people to get away from this one focus of "it's just SIBO. It's just one bacterium" or "It's hydrogen" or "It's methane." It's like a rainforest in your gut. You either have weedy patches in your rainforest, or you have a healthy, thriving rainforest. And we try to restore your microbiome by doing certain—It's not just about killing. It's also about re-growing the good bacteria. And you need to know what's actually happening before we get there.

Episode 3: The Results Are In: Finding Out What You Really Have With The Right Tests

Shivan Sarna: Exactly. Why is it important to test for SIBO just in general? Why is that an excellent idea?

Dr. Allison Siebecker: It sounds really basic but to get the diagnosis you can't really say you have it unless you have the test diagnosis. This is really important because a lot of times with a lot of conditions doctors will diagnose on symptoms. That's not a bad thing to do. I mean it's part of medicine. Unfortunately, though the symptoms of SIBO are nonspecific. There are maybe 35-40 diseases that could cause the exact same symptoms because you have the symptoms does not mean you have SIBO. And we really need to know because the treatment is going to be different, very different between SIBO to something like lactose intolerance which can cause the exact same symptoms.

The treatment for SIBO is antimicrobials which potentially could disturb a person's microbiome. We want to be sure that we need to do those treatments if we're going to do them. The treatment for lactose intolerance is taking lactase enzyme. We don't need antimicrobials and changing of the diet. It's very important to know if a person has it. There have been studies actually done on this now on how well you can diagnose SIBO based on symptoms and it was not well at all.

There are several studies to show. One study was very interesting. They compared small intestine fungal overgrowth—so that's SIFO for short—to SIBO. They did a culture, so they went and got a sample in the small intestine. Saw who had yeast, who had bacteria, who had both. Looked at the symptoms that were reported. It was indistinguishable.

I don't think it's awful for a primary care when someone comes in with those symptoms to try primary and secondary interventions which are not necessarily antimicrobials. They're diet and lifestyle. They are all the supplements that we know that can help digestion – fiber, probiotics, enzymes, hydrochloric acid, digestive tonics. Sure, go ahead and try those but if you're not getting much success after a few months go ahead and get the test and find out what a person has.

It's really important to get the breath test in particular because it can give us information about the gases that are present. Is hydrogen present? Is methane present? How much of each? The treatment is different for hydrogen versus methane. We need to know that. And also, we need to know how severe the gas is because that will also affect the treatments that we pick. In particular elemental diet – we haven't talked about treatments yet, but elemental diet has the ability to decrease very high gas levels in one two-week course which is not the case for the antibiotics and herbal antibiotics.

You need to see that breath test to see how high the gas is, so you know what treatments to advise and pick. And also, so you know the prognosis. If you're not going

to choose elemental diet so you know how many rounds might be needed of at least get a guess on that, of the other treatment. The test is pretty vital because it informs your treatment and your prognosis, and it confirms your diagnosis.

Dr. Megan Taylor: So, often, we get diagnosed with SIBO often after a long journey of having IBS symptoms, and we're like, "Yes, that, that's it. That must be it." And oftentimes, it is. But maybe it's only a part of it. Maybe it's only 50% of your symptoms, but the rest are due to something else. And that really needs to be addressed.

So, you want to make sure you're working with a provider that can do that with you and is willing to kind of turn over all those rocks and look for everything.

That's probably top, number one. And I would say—I mean just this week; I had an example of somebody who thought it was just SIBO all along. It turned out they had Celiac disease. Aahhh...

So, you want to make sure that whatever provider you're seeing is doing that basic work to screen out some of those big conditions that can mimic SIBO—Celiac disease, inflammatory bowel disease, certain particular food sensitivities or food allergies, those sorts of things.

Dr. Tom O'Bryan: And this is a test that you can do that looks for the leaky gut. It's called the Wheat Zoomer. And you can download information about this test on my website, theDr.com. You download this information. Take it to your doctor and say, "I'd like to do this test, the Wheat Zoomer." And this is the part of the test that's testing for intestinal permeability or leaky gut. There's more to the test than just this, but they put this in here too. And it's the most accurate test that's out there now... by far. It's the most accurate of all of them that are out there. Other tests are good. But this is the most accurate one.

And if your doctor won't do the Wheat Zoomer test, you can order it on my website. But it's so much better to take the information to your doctor so they can learn about it and use it with other patients also.

Dr. Mark Pimentel: So, it's well-known in medicine that from the time a patient comes to the clinic to the time a diagnosis is made, it's the best you can do to save cost. So, the longer that relationship goes before you have a diagnosis, the more burden it is on the patient—meaning test after test after test, days off work to do this scan or that ultrasound or this colonoscopy.

But it's also a burden to the healthcare system with the cost of these invasive tests. And the third burden—because there's lots of burdens here—the third burden is the burden to the patient financially because they have to do the co-pays. And the final burden is really not a burden, but a burn. And the burn is that, at the end of the day, all those tests are negative! So, they paid all this money, taken days off work to do it, and all they find out at the end of the day is that they don't have anything, and therefore it's IBS or SIBO or what-not.

So, it's quite a frustrating series of events that these patients have to go through. It's been sort of tragic—hence, the reason we're trying to get to the SIBO diagnosis or develop blood tests that can identify the patient right now because the sooner you get to a diagnosis, the more money patients save, the less the burn, the burden and all of that.

Shivan: How long does it really take for somebody to get an IBS diagnosis?

Dr. Pimentel: So, the average in the United States—there's been studies published on this—it takes about 6.6 years.

You say, "Well, that doesn't make sense. You saw the doctor. The doctor makes the diagnosis of IBS. They've done the colonoscopy. All of that can be done maybe within two or three months, all that testing. So how can you say six years?"

Well, the reality is you go to a doctor, the doctor says, "Let's do a colonoscopy, let's do a scan, let's do some blood work, some stool tests." Fifteen to twenty thousand dollars of testing later, it's all negative. You say to the doctor, "So what do you think, doc?" The doc says, "I think it's IBS." And you say, "Well, how do you know?" And the doctor says, "Well, all the tests are negative, and I'm a doctor."

And the patient walks away, gets some treatment, doesn't work, loses confidence: "Maybe this doctor doesn't know the answer. Maybe I'll go to another doctor." And then, you start over, and you start doing other things. And then, eventually, you get frustrated. You leave the healthcare system for a while because you say, "Nobody is giving me an answer that makes me satisfied" and on and on and on.

So, the six years really represents the time where the patient sort of just throws their hands up and say, "Well, everybody says it's IBS, I guess it's IBS." And that's not a way to make a diagnosis. At least, traditionally, medicine, you will want to be definitive.

Dr. Pimentel: So, the term IBS-SMART refers to a commercial product that is really representing the second-generation blood testing of anti-CdtB and anti-vinculin antibodies. We now believe that food poisoning is the starting event that leads to a series of events leading to bacterial build-up in that subset of IBS that is SIBO.

And so, the blood test looks for the marker of food poisoning, which is the anti-CdtB toxin, and then an autoantibody that forms in a lot of these patients that attacks the nerves of the gut.

And in studies that we've already published and done, we've shown that the antibodies actually bind to that one particular cell, among others. But in particular, it binds to the cell that we think is responsible for the cleaning wave.

And so, we think these antibodies is impairing the nerves of the gut and impairing the cleaning wave. And that's the hypotheses.

Shivan: What tests should we take to find out if we have SIBO?

Dr. Siebecker: There's really just one test we mostly use to diagnose SIBO but there really are three that could. The three are a culture...That is done with an endoscopy. What that means is it's done like in a hospital or in an office setting where there's a tube passed down through the mouth and the throat, through the stomach and into the small intestine. That's called an endoscopy and then in that test they can grab some of the fluid that's in the small intestine, bring it back out and then they can culture it to see what bacteria grow. And then they can find out if there's too many there. So that

would be an endoscopy with culture. That's not done very often. However, if a patient is going in for an endoscopy which is common when there are gastrointestinal complaints you can request a culture be done. And they may not agree because it's not so common, but you can request it.

But what we always do is a breath test. So that's the main test we use for diagnosing SIBO and the breath test checks the gas that the bacteria make. It checks hydrogen and methane gas. It doesn't check hydrogen sulfide because the technology hasn't been fully created for that yet. It's not available. It's in the works but not available. We just check for the two gases. And this test is done by drinking a sugar solution like a carbohydrate that feeds the bacteria so that they'll be encouraged to make the gas.

Then we test that gas. Because what happens is when the bacteria make the gas in the small intestine or anywhere in the intestines but particularly the small intestine it will diffuse across the lining into our blood and then it will travel to the lungs where then it gets expired into our breath, as our breath. So that's why the breath test can capture that gas. And how we can distinguish that it's SIBO is based on the timing. The test is done for two or three hours and the first two hours in general represent the small intestine time and the last hour in general represents the large intestine. We can see was an excessive amount of gas made in the time of the small intestine. That's basically how we can tell. When a person is requesting this test what you would want to ask for is what I would most suggest asking for is a lactulose three-hour hydrogen and methane breath test.

Shivan: Because the lactulose is that sugar that you were talking about. It's not like oh, table sugar swirled around.

Dr. Siebecker:	Right.
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Shivan: It's lactulose and it's a prescription, right?

Dr. Siebecker: Actually, lactulose is a prescription item. I don't think it should be. I think that's like a mistake but somehow, it's still on prescription list (USA). It's used as a laxative and so what it means that it's prescription is that only a doctor with prescription rights can technically order that test which is troublesome because a

lot of people will see a nutritionist or somebody with maybe an acupuncturist who doesn't, or a chiropractor who doesn't actually have prescription writing rights. And so, then they can't order that test. So that's troublesome. I really wish we could take lactulose off the prescription list. I'd like to see that happen. But in the meantime, if you're seeing a practitioner that doesn't have prescription rights what really, I think is the best thing to do is that they suggest and you just go to someone, a doctor of your own that has prescription rights to get the test. Because that is the best test.

Shivan: And it doesn't have to just be your GI doctor.

Dr. Siebecker: No, it can be a primary care, family doctor. Or a lot of times what will happen is practitioners who don't have prescription rites will be in a practice with someone who does and then the test can be run through the practice.

Shivan:Are there other types of breath tests that people take?Dr. Siebecker:There are. Yes, there's not just a SIBO breath test. It'sgood to know so you don't get confused. Mostly other breath tests are used for othertypes of carbohydrate testing. So, for instance, lactose intolerance test is a breath testand just to clarify lactose is different than lactulose. Lactulose is what we normally usefor the SIBO breath test.

That's just sort of like a lab created sugar. Lactose is what exists in milk. And a lot of people are lactose intolerant and that's the test that, one of the tests you can use to diagnose is a lactose breath test. It works on the exact same principle actually. You drink lactose instead of lactulose. The bacteria make the gas, it comes out and it's based on the timing. If a person has excessive gas anywhere in the test, they could be said to have lactose intolerance. But what's interesting is if that gas is excessive in the first two hours, they have SIBO. A lactose test, other tests can be used to indicate SIBO. But it's not our primary test that we use. Another example would be fructose. That's just another carbohydrate. There's fructose malabsorption and intolerance as well and there are tests for that. And there's also sugar alcohol tests that you can use like mannitol and sorbitol. There are other types. And, in fact, there's even one more which is H. pylori. A lot of people are familiar with that as the bacteria that's in the stomach that could cause ulcers. If you have that there it could be an infection and there's a breath test for that. And that is totally different. That's the urea breath test. Completely different breath test.

Shivan: What about a glucose breath test?

Dr. Siebecker: Glucose is used for SIBO and the two main tests for SIBO are a glucose breath test or a lactulose breath test. And the difference is the glucose diagnosis SIBO that's in the top of the small intestine only. Because glucose is absorbed within the first two to three feet of the small intestine. We talked earlier about how long it is. It can be anywhere from like 18 to 25 feet long. This test, the glucose test is only going to help you identify SIBO if it's in the top two to three feet of the small intestine. It has some significant limitations. The benefit to the glucose breath test – there's really two main benefits. Anyone can order it. You don't need a doctor to order it. Anybody can just order it.

And also, it's very good at diagnosing SIBO that's there. Because pretty much all bacteria consume glucose so if they're there they're going to eat it and they're going to ferment it. It's just that if you did that test and it's negative you then need to go on and do a lactulose to test the bottom 15 feet of the small intestine.

So that's why most people just use a lactulose. They're trying to be more economical and save time and money. If you're just using one most people will choose the one that

can test the whole organ. However, it would be great to do them both.

Shivan: Right. I never thought about that. Okay. Well how do you do this breath test because what is it? Is it like a breathalyzer? I mean what is involved with it. I've done them at the doctor's office, and I've done them at home. And because there's a diet to prep for it and because also when I did drink the lactulose it really didn't make me feel well because all that fermentation was going on. I really prefer doing it at home because otherwise you're sitting in the lobby of the doctor's office for three hours. If you can find a doctor and most people do now to allow you to do it at home I would

recommend that personally.

Dr. Siebecker: Yes, that's a really good point. So yes, you can do it like in like a lab or a clinic that runs the test with the machine there. In that case you're blowing into sort of like a tube with a bag. You can do it at home like you said. There are kits to take home and with that you'll either be blowing through just another little sort of tube thing or a straw to collect your breath. So those are the ways it can be done. It just depends on how your doctor wants to do it. Usually if the doctor owns a machine in their office, they want to run it in their office. But technically they can give you a kit to take home and do it. They'll then process it on their machine in their lab. You can do it at home. Like you said, it's done with a prep diet beforehand which a lot of people find really onerous because it removes so much foods. It's trying to remove most carbohydrates because we want to get a baseline where the gas has been lowered because you haven't been eating carbohydrates. So that when we take the test carbohydrate, we're just seeing the reaction to that in terms of the gas rising. And like you said it can cause symptoms because it's a challenge test. The test is meant to provoke the bacteria to make gas so we can test it and that can cause symptoms.

Shivan: So, we are going to show you one of the versions of the test kit, if we may, right now. And if you have never seen this before, or are like, "What is it? What's a breath test? `` it's going to measure your hydrogen output from the bacteria that might be living in your small intestine, and/or the methane gas that's being produced in the small intestine from the overgrowth of that bacteria.

Eric Hamilton: That's right! There's a third gas that we measure in those also which is carbon dioxide. Now, we don't use to—the doctors aren't using that to interpret your results. They're using that for quality control to make sure that the sample that we're getting from you is actually a good breath sample from the bottom part of your lungs that we want. We don't want your mouth air. We don't want the part that's between your mouth and the top of your lungs, the tree roots. We want from the bottom of the tree roots.

Shivan:

Okay, that's good.

Eric Hamilton: So, the way that these systems are designed is it removes the first part of your breath inside of the bag, and then you'll insert the tube while you're blowing.

These are specially evacuated tubes that are designed specifically for breath testing. They have rounded bottom, so people don't confuse them with blood tubes. They're crimped top. They're squeezed on, so you can't undo them because we want what's called a closed system. We don't want any contaminants from outside as best as possible.

Shivan: Okay.

Eric Hamilton: So, what will happen is, when you're at home or even at the doctor's office, they may show you. You'll just blow in. And as you're blowing into here, this bag will fill. You're then going to insert this tube all the way inside for about two seconds, and then you blow. And then, pull it out, and then you'll stop breathing. So, I'll show you.

Shivan:	Okay.
Eric Hamilton:	Done!
Shivan:	Wow!
Eric Hamilton:	That was

Shivan: That was it.

Eric Hamilton: That's it. I usually make jokes and say, "Shake it up, you'll see your breath in there," but you don't. So, you won't see any condensation. You won't see any breath. You won't see droplets. That's normal.

it!

Now, if you're doing it in a quiet space, and you've got good hearing, sometimes, you'll actually hear the tube go [sucking sound].

Shivan: Oh neat!

Eric Hamilton: But don't worry about it. We quality test 100% of the tubes. So, every single tool gets tested by hand to make sure that they have the appropriate vacuum in there to pull your sample right.

And that's a big deal. I mean that's a lot of time consumption to physically poking every single one.

So, you'll notice that some of them, the little white piece is sometimes inside puckered downward, and sometimes it's puckered outward...

Shivan:

It doesn't matter.

Eric Hamilton: It doesn't mean anything. Sometimes, you may see a stick hole, like a little needle pink. That's just from us testing. No big deal.

Shivan: Okay, alright.

Eric Hamilton: We've got all the data to show that if you've requested to see, we can show you that, yup, we're good to go, you're safe. Don't worry.

Dr. Mona Morstein: SIBO breath testing, which most of us, using the 10 grams of lactulose, we get a baseline test, and then we're stimulating the growth, or stimulating the production, of either hydrogen or methane by giving the SIBO bugs, if they exist there, the lactulose.

And then we measure what we say proximal and distal in medicine. Proximal is closer, and distal is further. And so, every 20 minutes, we're saying, "Well, is the SIBO by the stomach? Okay, no. Is it further into the duodenum, or is it in the jejunum? Is it further in the jejunum? Is it getting into the ileum?" And we're just measuring how far up the gut has SIBO gone if it exists at all.

There is a great deal of grey interpretational area in SIBO testing. Absolutely not is it always clear yes or clear no.

For one thing, that transition zone, which is at 120 minutes... What if everything before that looks great, if in the transition zone is positively elevated, but then we see, as it enters into the colon, it's equally high or higher?

So, at this point, the physician has to wonder, "Is it fully eradicated? And actually, that transition is already in the colon? Or is it in the end of the small intestine, right where the ileocecal valve is, and that's the only part that still has SIBO?

That's one of the common interpretational instances of SIBO testing that we have to look at. And that's going to be helped by talking with the patient, and analyzing how's the patient doing, and have they had significant reduction of symptomatology. And you're just going to have to kind of guess educated at times.

We also, of course, have Dr. Pimentel's idea of any methane at 3 or higher with constipation indicates a positive test. Although in the SIBO research world, it's not like that's been overly embraced in studies or by other people analyzing how do we interpret this test. So that has to be looked at as well.

There are some SIBO testing you. You have to get it back with a very open mind. You have to see a lot of patients to start knowing some of the flows and what makes sense, and what needs to be interpreted for this individual patient.

Gary Stapleton: So, your small intestine is not supposed to have large amounts of bacteria. They call it 10 to the 3 colony forming units or less. The large

intestine or your colon is supposed to have 10 to the 5 colony forming units or much more than that.

So, when the lactulose goes through, if it's a negative test, for SIBO, there's no gas for the first 90 minutes or two hours, however you want to look at it. But when that lactulose makes it to the colon where there are bacteria, guess what? You have a rise at the end of the test. That's your control.

We know that patient prepped because we have a nice, little baseline. Now we have the lactulose going through, no gas. Gee, shocker, when it gets into the colon, you have a rise of gas. Why? Because it found bacteria. That's your control.

Gary Stapleton: And I can tell you, after doing, as I mentioned, just about 30,000 now (maybe 25 that we've actually had conversations with the clinicians where we're not able to match the data—we attribute that potentially to other issues (as an example, permeability issue, like a leaky gut issue, or an issue with the large bowel versus a small bowel). Most of the time, I'd say by and large, you always have to be able to match the symptoms with the test. That's what makes it so good.

Shivan: So, if you're on the borderline of binary yes/no that you have SIBO or not, open to interpretation—I had this situation. And I talked to you, and you're like, "Well, are you constipated? Do you have diarrhea?" We talked about it. And then, we were able to, with my practitioner, make a conclusion based on that. So that's that whole symptoms associated with the numbers.

Dr. Mark Pimentel: So recently, we were able to validate breath testing completely. I mean there's been controversy about breath testing. People say, "Well, it's not as accurate as culture" or "We don't know if it means that..." Let me start from the beginning.

When you do a breath test, you drink a sugar. And the sugar we prefer to use is lactulose. It's a non-absorbed sugar. So, it stays in the gut and gets all the way to the colon. So, you can get a good flavor of what's going on in the entire gut. When the sugar sees bacteria, they ferment it. When they ferment it, they produce gases. And we look for the gases that humans don't produce. And the ones we've been looking for are hydrogen and methane. Until recently, just those two.

So, when we see those rise early, meaning within 90 minutes, we know that it's likely that those gases came from the small intestine. The argument has been: "Well, but what if things go too fast to the colon? Then all the sugar gets dumped in the colon. And then, maybe you're going to get hydrogen from there. Maybe that makes the test inaccurate."

But recently, we've shown now that using deep sequencing of the small bowel, we show that SIBO can be proven by deep sequencing—greater than 1000 bacteria per milliliter in the gut is SIBO—and that both of those correlate directly with 90-minute breath tests, meaning the breath test is valid. Culture greater than 10 to the 3, not 10 to the 5 is the correct number. And we can identify all of these with sequencing.

And the most important thing, they all interdigitate with symptoms. So, we can correlate with diarrhea, urgency and bloating with these markers.

So, the point is, for the first time, we've internally validated the breath test. So, breath tests are valid. And they predict response to antibiotics. That's another paper that we presented at a previous meeting.

Dr. Mona Morstein: Say that we do a stool test, and we're reflecting any microbiome in the small intestine is scientifically completely wrong, completely inaccurate.

And remember, methane bugs are in the colon. Are they causing your SIBO? How do you know? You have no idea if it's gone into the small intestine. It just means it's naturally in your colon because 98% of our microbiome is in the colon. It has 500,000 different bacteria. C. diff is natural in there.

We cannot, we must stop physicians from doing stool tests and saying this has any indication of what's going on in the small intestine.

Shivan: We've been talking about what tests do diagnose SIBO. And what tests don't diagnose SIBO because there's confusion about that too.

Dr. Siebecker: I think the most confusing thing would be the stool test. There are a lot of docs who think a stool test could diagnose SIBO just because it's of the intestines.

Shivan: Right, right.

Dr. Siebecker: But it can't. The stool really represents best the very end of the large intestine. It doesn't show bacterial overgrowth in a separate organ that's way up above. The stool test can indicate something about the small intestine, but they cannot diagnose small intestine bacterial overgrowth. If you see an overgrowth of bacteria in a stool test that diagnosis is large intestine bacterial overgrowth or LIBO. Sometimes people just call that dysbiosis. Sometimes they call SIBO dysbiosis. We could say in general they both would fall under that category. Dysbiosis is just when there's something wrong with the bacterial situation of an organ.

Shivan: Not even just the intestines? You can have other organs that have dysbiosis?

Dr. Siebecker: You could, actually. But usually we use it for intestines. There's another test that sometimes people try and use to diagnose SIBO and that's urine organic acid test. I think this is a really cool test. I love it. It indicates all kinds of things, but it can't technically diagnose SIBO. And the labs themselves that offer this will tell you that. There's been some confusion about that. What it can do is it indicates some bacterial metabolites and if they're in excess we know that there's too many bacteria and overgrowth.

But what it can't do is distinguish between the large and the small intestine.

It's not able to tell the difference between those two organs so it can at least give you a sense but you're still going to need the breath test actually for some very other important reasons that the urine organic acid test (OAT) just wouldn't give you that information. Now this is really important because again we are talking about the doctors who can't prescribe or order the lactulose breath test. What will happen a lot of times unfortunately, is that those doctors will just order a urine organic acid test and that's not really the proper way. It doesn't diagnose SIBO and it's not really a proper way to handle the situation of SIBO.

Shivan:	That is a very cool test.
Dr. Siebecker:	Urine organic acid test.
Shivan:	Yes.
Dr. Siebecker:	I love it.
Shivan:	I love that test.

Dr. Siebecker: I am not dissing that test. I love it. And run it along with but it just doesn't diagnose SIBO.

Shivan: If you can afford that to run along with you will learn a lot of things about your body and how it functions.

Dr. Siebecker: One of the things I love about that test is that it can indicate yeast issues. Again, we wouldn't know if it's the small or the large but it's one of the three tests that I have recommended and can use for yeast problems.

Shivan: I know you have a lot to say about stool tests.

Dr. Ilana Gurevich: I do have a lot to say about stool tests.

Shivan: I want to hear everything.

Dr. Gurevich: They are useful, and they are limited. There's the typical—what you get through Quest or LabCorp—an O&P, ova and parasite test. The way that works is you poop in a cup then you take a certain amount of your stool and you mix it in some water or preservative. You do that three days, and then send it to the lab. The lab takes a drop of that and puts it on a slide. Already we've taken a small bit of stool and diluted it down to a drop. Then they zoom in 10,000 times, looking at a 10,000 time zoom in ten fields. If they physically don't find an egg or a parasite crawling around, they're going to say it's negative.

It's ridiculous. You are literally looking for a needle in a haystack. If you're chock full of needles, then needles are easy to find. Your O&P is going to be positive. If you're like the majority of the population who is not chock full of needles, they're going to say

it's negative. This is a specific test but it's not sensitive. If you are positive you are a hundred percent positive. However, if you're negative it doesn't mean you're negative. It just means you're not one hundred percent positive.

Shivan: Do you have a lab that you really like?

Dr. Gurevich: I do. Parawellness Research. It's not a lab because it's not covered by insurance. He's actually considering it a research project. That's how he gets covered through is IRB to run these tests. This is who I'm using almost exclusively now. He was a parasitologist. This is what he did professionally, and he retired. Now what he does is... You send him a urine and stool he looks at every sample well over a thousand times.

You don't get insurance coverage so it's pricier, but I feel like he is actually looking.

Dr. Mona Morstein: I have a triad of tests that I do with people. One is the SIBO testing, one is food sensitivity testing (IGG, blood food sensitivity testing), and the other is a stool analysis. So, if you know the small intestine, we can analyze with the food sensitivity and the SIBO, but the large intestine it may be the problem or often times it can be a problem in concert with the small intestine.

These are my three triad go to that I'm always thinking about when a person is presenting to me for the first time with a lot of gastrointestinal distress. There are even though some other studies, you know we might need to do a cortisol test, uh, a saliva cortisol test. That's in the bag as well, uh, too little cortisol, too much cortisol. You're having gut inflammation so, uh, that's a backup test. There are some other ones to sometimes think about but those, the ones I mentioned first are the three main ones.

Dr. Jason Hawrelak: So, it has to be essentially DNA-based. I think that's the biggest thing. Culturing is old, outdated technology for assessing the microbiota composition.

It still has its strong points for determining antimicrobial sensitivity of pathogens and finding certain pathogens, yes. But when you're trying to assess the health of the ecosystem, you have to use technology that's capable of seeing that ecosystem.

And culturing doesn't. The old technology where we take some poo, put them in a petri dish and see what grew could only grow maybe 30% of what's there which doesn't tell us very much about that ecosystem.

And most tests that we, as clinicians or the public had access to was even less than that 30%. Then they tell us about four different species and we're trying to guess the health of the ecosystem based on that. I think that's extremely problematic and can't be done. You need to get an overall picture.

Shivan:

Why is it important to retest after treatment?

Dr. Allison Siebecker: This is such an important question because so many doctors don't know that they should be retesting, and they don't retest at all. And you told me you had a friend that experienced that.

Shivan: It's frustrating.

Dr. Siebecker: It's really frustrating. First off. I would say that if a patient is 90% better in terms of their symptoms after their treatment you don't have to retest. I mean that's the goal. My goal is 90% better. We'd love to see 100% but we don't always for various reasons we can talk about. When that happens you've hit your success, you don't have to retest, it's optional. But if a patient is less than 90% better, particularly if they're less than 80% better that is called for follow up. Because what you need to know is did the treatment work? Did it not work? Now this seems simple but it's vitally important because what if the treatment worked. But you're assuming that it didn't work because they're not better. But if you run that test and then you see, in fact, the SIBO has been cleared from the retest that means that the symptoms that are left are caused from something else. It's highly helpful for your whole situation and for your diagnosis and further treatment. Because now we need to look for what else could be causing it and go and treat that. Very, very important when the symptoms are not fully better. But let's way the SIBO is still present, which is very common because what we see all the time is SIBO often needs multiple rounds of treatment. It's very hard to get all the SIBO gone depending upon the gas level with just one course of treatment. It's asking too much of the treatment. In that case you want to evaluate how the treatment worked because maybe it didn't work well. And you go okay. That was not a good match. We have to try something else. And then you jump to a different treatment altogether. It's very informative.

There's another reason too. When patients have high gas, it can take a while for them to feel better. Like we might really need to see that gas come down pretty low before their symptoms are going to be relieved. Meanwhile the treatments are working. Another reason to retest is to encourage the patient along this journey and when they have had high gas because like let's say they did a treatment and it brought their gas down by 50 points, but they still have levels of 60. And a 20 is considered positive.

So that means they still have pretty bad SIBO. But meanwhile we've made phenomenal progress. But they're like ugh, you know, I'm doing these treatments. I'm not feeling any better. This stinks. They see that retest and they go, "Yeah!"

Shivan:	Right.
Dr. Siebecker:	I am halfway there.
Shivan:	Right. Progress.
Dr. Siebecker:	It's really important.

Dr. Mona Morstein: As a physician, sometimes I follow guidelines, and sometimes I just don't.

The way I've been doing it for years, and the way I still am happy doing it, is if a patient has been dosing, if we've been giving them prescription antibiotics, I do wait five days after the end of the antibiotics before I retest (for SIBO). For the natural antibiotics, I just tend to wait one day, and then retest. I'm very comfortable with doing that, my testing to come back really good, as a result of that.

The only key, of course, is with the wait. That's why it's so important. As soon as they're done with the antibiotics, when they finish the antibiotics on Tuesday, Tuesday night, they have to start the prokinetic because if we've eradicated SIBO, but now are waiting five days, they do the test, it takes me five days to get it back, it could come back in 10 days. So, we have to, right away, get protection. And I could get a negative test, but now, all of a sudden, I'm like, "Why am I getting semi symptoms back?" 10 days, if it's backwashing, that's not good. The day they stop whatever natural or prescription antibiotics, they start the prokinetic. I don't have any problems having them on prokinetics when they're doing the testing. And I would never not have them do that because I just don't want that to come back while we're just waiting for the retest and results.

Shivan: How long after treatment should you retest because there's controversy about this.

Dr. Allison Siebecker: Yes, I believe it should be within two weeks. And the reason is because many people relapse. As we talked, about two-thirds or the majority of people who have SIBO relapse is actually expected. We work very hard to make that not happen. We have all these things we do to help that. But many people will relapse within two weeks. It's a very common time really at about two weeks. We want to get the test done before they relapse, so within two weeks. **Now something that's confusing to a lot of people is that on the lab instructions for many different labs it says you can't have taken antimicrobials, antibiotics of some kind within two weeks before you test.**

That only applies to the first test when we're just trying to get our first test to see if a person has SIBO. That's not so when you're retesting. When you're retesting, in fact, it needs to be within two weeks. In fact, we directly want to see the effect of those antimicrobials. That's why we're testing so soon. Because we want to see what they did. We want to see that they lowered the gas and how much, so within two weeks.

Shivan: When it comes to GI health, there is a conversation that happens about SIBO, for example, or other gastro issues and cancer. This whole "Careful, you don't want to guess what you've got going on." You want to really hone in on those underlying causes because, number one, it could help fix you, or help you to manage your condition, and you might be missing cancer in terms of the diagnosis.

Dr. Michael Traub: Yes. Well, it's a big concern for me because of my high sensitivity radar about cancer, especially undiagnosed cancer. I really want to know

what I'm treating. It's really important because people who have SIBO symptoms, those symptoms can be symptoms of cancer also.

And some of the ones they worry about are ovarian cancer which causes vague abdominal discomfort in women as one of the first symptoms of the disease before they're sick in any other way. They just have this kind of vague abdominal pain. And unless you do a pelvic ultrasound, there's not a good way of diagnosing that. So, I would want to rule that out sometimes.

Pancreatic cancer is another masquerader for SIBO sometimes. And that's a very devastating disease. I had a case of a patient, a long-term patient of mine, last year who I was treating for SIBO. And he ended up having weight loss and increasing abdominal pain. In fact, like most with pancreatic cancer, he didn't live for more than a couple of months.

And that was really hard on me because I'd known this guy for a long time. We had a lot of things in common. I really liked him. I'm just really sad to see somebody who was healthy two months ago pass away so quickly. It was very devastating.

Shivan: Devastating, I'm sure.

Dr. Traub: Yeah, yeah, yeah. There are other things too that I think need to be ruled out. Endometriosis can sometimes present like SIBO and cause SIBO-like symptoms. There are a lot of underlying conditions that contribute to SIBO that I think need to be explored and investigated and diagnosed in order to really deal with this condition effectively. If you just try to treat a bacterial overgrowth and missing something that's contributing to that happening in the first place that's interfering with the migrating motor complex and the motility of the small bowel, you're not going to be successful. You have to deal with the underlying causes. And that, as a naturopathic physician, I think that's one of the things that gives me an advantage. I am so oriented towards treating the cause of disease, not just the symptoms. And so that's very important to me.

And throughout the evolution of my career, I find that that is more and more what I'm looking for, rather than some kind of quick fix to something. I don't really have much interest in that. I really want to deal with people who have chronic, recurrent, intractable problems that they haven't been able to really find out what was going on.

And for many people, SIBO can be part of the answer to that as we know. A lot of people with SIBO have been suffering for years, and nobody really could help them. But there may be more to it than just the SIBO itself.

Episode 4: An Apple A Day: The Controversial Truth About What To Eat For Lifelong Health

Dr. Partha Nandi: You know, Mark Hyman talked about that the most powerful weapon you have against disease is a fork. And I so agree with that. And what that means is what you take from your fork and put in your mouth is so critical in how your gut health and your body responds.

So, what do I mean by that? If you keep eating processed foods and crap, crap is going to give you crap out. Your body, we have never seen in human history, the kind of stuff that is being put in our bodies. There are no receptors for it. Your body has never, ever seen some of these chemicals that you and I can't pronounce and most of the population doesn't even look at.

So, when those chemicals, when those things come through in the right individual now this is really important. It's not every single person on the planet, in the right individual. It's kind of like an amazing combination of factors, a perfect storm. You've got somebody with the right predisposition, which means that you are already ready for that inflammation to come right, and then here comes all these foreign substances. And so, your body attacks—attacks with all its might. It's trying to save you and save your gut. And when this happens again and again, stuff that you don't know what's in it—and that includes eating in restaurants.

And this is something that people don't understand. You think that this is just happening to populations that are low in resources and are either poverty-stricken, they're eating bad stuff or fast food. It's also in populations that are really, really wealthy. They eat out all the time. Guess what? When you eat out, you don't have a single clue what they're putting in there. They're putting in simple sugars. They're putting in stuff that's going to make you buy more and cost less.

So many of our friends, neighbors, brothers, sisters are doing this. They're going out to eat because that's a sign of what? Affluence. And that is just as going to your neighborhood fast food restaurants and getting the crap there.

So, in order to preserve your gut, number one is what you put in your mouth.

Dr. Pedram Shojai: But broad strokes, if you think you're eating enough vegetables, you're wrong. Eat more vegetables. Right. We used to consume at least 10 times more fiber. Just, genetically as we evolved. But we're talking 100 years ago, not that long ago. We just ate a lot of fiber, and now that that fiber is gone, the detox mechanism of the large intestine, is really compromised. We can't get Mercury and all this crap, no pun intended, out of our systems. But, at the same time, we're also not feeding the bugs that are the symbiotes that would then help produce butyrate, and other short chain fatty acids that are good for our health, that help modulate immunity, and all of it. So, broad strokes, you've gotta eat a lot more vegetables, prebiotic fiber in ferments, just in terms of lifestyle.

Dr. Peter Osborne: Number one: Is this good for me? Rule #1 in nutrition, it's a cardinal rule. You can break it all you want. But understand that if you do break it, there will always be a consequence to pay. And if you're willing to pay the consequence, by all means, break the rule. But here's the rule. You cannot get healthy eating food that is not healthy. That's the number one question. So, when you've got a Snicker bar in your hand, it's not healthy. And if you answer the question honestly, you'll put it down.

Rule #2: Am I allergic to it?

Rule #3: Does my body reject it? In essence, maybe I'm not allergic to it. Maybe I did all this allergy testing with the doctor, and I didn't come back allergic to it. But every time I eat, I feel horrible. Or every time I eat it, I bloat up to here and I'm pregnant. Honor your body's messaging. Your body is smarter than any doctor. And if your body is rejecting it, you should listen to that rejection. That's your cue to say, "Okay, when I eat this food, I don't feel well, or this happens and that's not good. Therefore, I'm not going to eat this food again" as opposed to "I'm going to eat this food because I really like it. And I've got a bottle of Pepto-Bismol right here. I'm just going to chase that bottle of Pepto-Bismol down so that I don't feel quite as bad when I eat it," which is what a lot of people do. They take Tums and Rolaids and Pepto-Bismol, Nexium, Prilosec, Tagamet. Whatever your poison is that you want to chase your poison with, it's a bad idea.

So, follow those three rules. And that's a great place to start.

And also understand the premise that eating is warfare. So, the act of eating is an actual act of warfare. It is your gut and your gut's resources against the food that you're putting in your mouth. And if the food is hard to digest, and you're eating it in mass, then you're going to overwhelm your gut's resources.

Dr. Osborne: And maybe you only overwhelm it for the one meal. Maybe you just overate that one meal, and you recover. But if you do it consistently enough, you will deplete the resources of your GI tract. You will create what's called intestinal hyperpermeability or leaky gut. And you will open the floodgates into your immune system to trigger autoimmune disease.

That's what happens when you eat foods that you shouldn't eat. Over time, it destroys and damages the gut lining. The gut lining then starts to leak all of the contents of your intestine into your bloodstream, overwhelming your immune system, creating a scenario over a decade, over two decades, that potentially leads to chronic degenerative diseases, primarily autoimmune diseases.

Dr. Tom O'Bryan: And when we talk about the microbiome, what's critically important is the diversity. Now, back in the '80s, '70s and '80s, I'd give somebody lactobacillus and they're going to get better or it's going to help, or Bifidobacterium is going to help.

Today, here we are almost 40 years later—it's embarrassing to say 40 years later we're still doing the same thing, but we know now it's really the diversity. It's not one family or two families of microbiota that's so important.

So, here's a pearl for everyone. The recommendation that I give to all of our patients when we're dealing with gut issues and to bring some balance to the guts—there are two things that I would share here. The first is when you buy your vegetables, always get organic—if you can, always get organic—and buy a couple of every root vegetable they've got. Get rutabagas, turnips, parsnips, carrots, sweet potatoes, radishes, every vegetable they've got. And you have one root vegetable a day, one root vegetable a day. Why? Because the fibers in the root vegetables, they're called prebiotics, they feed the probiotics. They're the food for the good bacteria in your gut.

So, you want to encourage the colonization and thriving of the good bacteria. So, you do many different types of root vegetables, so that you're feeding different families of the probiotics in your gut, not just carrots every day. You alter it. So, with any gut problem—now the problem with SIBO is some people can't do fermented vegetables. It irritates them. They've got so much of the bad bacteria there already, and it irritates them. So, if you have a problem with that, just pause on that until you get some of that bad bacteria that's in your gut in order, then you start this.

This is the rebuilding process. And sometimes you have to remove before you can rebuild. But when you are in the rebuilding process, this is two components that you always include—prebiotic vegetables and fermented vegetables.

Shivan Sarna: Perfect!

Summer Bock: I generally tell people to wait until they don't have any more symptoms. I even usually say at least four weeks with zero symptoms before they start introducing those foods back. I find that that's really important because people need time to make sure that really...so when I look at SIBO I also see leaky gut. Because usually people when they have SIBO their intestines are inflamed, there's a very likely strong possibility that they're dealing with intestinal permeability on a more regular basis than a healthy person for extended periods of time. And what I've noticed that happens with people who are struggling with that if they bring in the fermented foods, they're going to bring in histamine. They're bringing in all these other things that can cause a response in the body and I don't know if it's the histamine that causes an increased intestinal permeability, but it seems like histamine itself might actually cause increased intestinal permeability.

There's a lot of histamine in fermented foods. And as much as I love them, and I think they're fantastic I watch people get amazing results in their bodies when they eat fermented foods. But when SIBO is on the table or like a really bad case of leaky gut where you see things like real histamine responses. You have wheezing, you have runny eyes, you have bloodshot eyes, you have a tendency to get hives. There might be some asthma reactions. Some people just see it as headaches or brain fog or tension around their head. Some people it goes all the way to eczema and psoriasis or maybe it looks like candida symptoms. But all of these to me are like the similar

connecting, you know, thread is histamine. I see a lot of histamine issues with people who struggle with SIBO.

Kiran Krishnan: Fermented foods are great. They have a long history of use. Some people can be sensitive to certain types of fermented foods. So, you want to try them out a little bit at a time. There are people that could eat kimchi all day long, maybe they're of Korean descent, and their microbiome is adjusted to that. There are some people that would eat it, or eat sauerkraut, and kind of get an inflammatory reaction to it.

Fermented foods are really complex biological entities. They've got dozens of bacterial species in them, lots and lots of chemistry going on in them. A lot of it, most of it is good. But in some cases, it may not agree with their system.

So, it's always good to try a little bit and make sure it agrees with your system. And if it does, then go for it, because it's nothing but good stuff for you.

But fermented foods aren't a source of probiotics. That's a big misconception.

Shivan Sarna: Let's bust that myth.

Kiran Krishnan: Yeah. And so, people always say, "Oh, I don't need probiotics because I drink my kefir" or "I drink my kombucha" or "I eat my sauerkraut."

Fermented foods are nutrient-dense foods that feed the microbes that exists in your gut. The bacteria that are in the fermented foods, they don't survive the process of digestion. And even if they did, they can't function in the gut. They're designed to break down sauerkraut cabbage sitting there in the fermentation system. They're not designed to live in your gut and perform the work of a gut bacteria.

Same thing with the kombucha bacteria that you find, the yeast and bacteria found in kombucha or any of the other fermented foods. The bacteria that are used for fermented foods are specialized to ferment those particular foods outside of the body. They have almost no function inside the body.

So, I always tell people our ancestors got both. They got probiotics, and they got their fermented foods. So, there's no reason why—nor should—we do just one of the two. There's a synergy between having both of them.

Dr. Ritamarie Loscalzo: You know I'm always of the opinion that we're all unique and so for some people it may aggravate and some people it may not. I would say make your own if you're going to make probiotic foods so say sauerkraut. And you actually spike it with the particular strain you're trying to dominate. You take the cabbage and you chop it up real fine and you get it all going and then you add a couple of spoonful's of bifidus or D-Lactic acid free and you let that proliferate. And you try it, right. You try the regular. You try a teaspoon. If it causes you to get all bloaty and gassy it's probably not good. But I think that everybody's at different stages and so I think what happens when I have a problem with the SIBO is people get this, it's this super strict, you know, a Fodmap diet and elemental diet and don't take probiotics. It

gets very rigid and people get scared. And then what does fear do? It stimulates sympathetic and they're out of parasympathetic. I think it's just flow with it and figure out what of this big bucket of things that you could possibly do.

Dr. Jason Hawrelak: I tend not to use sauerkraut as a therapeutic tool. I do encourage patients, in the right scenario, to make it, and I think it's part of that healing process. It's pretty amazing to be involved with making something that's getting yourself better. I think there's some gut healing properties with sauerkraut as well, which are wonderful. It tastes nice.

However, it's a wild ferment because we don't necessarily know what strains it contains, we don't know amounts it contains, it usually contains a strain of lactobacillus plantarum at a therapeutic dose. One teaspoon will usually have at least a billion CFU or colony-forming units, so a billion microbes per teaspoon, which should make it therapeutic dose-wise. It's just the fact that it's a wild strain.

So, some nice sauerkraut that I'm making here will actually contain different strains of the same species compared to yours in your house which would be different than your neighbors unless you use the same batch of starter culture.

And I think it's the differences in these wild ferments that, for me, may take them out of the therapeutic realm and put them as adjunct treatments, but I wouldn't rely on them on the same way.

Yogurts can be in that same category, but then they can also be different too because you can get commercially available yogurts where they actually add in therapeutic strains in therapeutic amounts, so you know exactly what you're getting. But there are ones that are called therapeutic or probiotic yogurts.

Dr. Steven Sandberg-Lewis: If you eat your food slowly and chew it slowly and thoroughly until it's liquid, and then swallow it—by the way, if you haven't done that, you'll find that your muscles will naturally be trying to swallow the food really way before it's liquid.

And you have to think about it, the first few times you do it, and really concentrate on not swallowing the food until it's fully liquid.

My wife, who is a stress management coach, she has a really smart saying, and that is, you have to fool your body into thinking you're safe. And the best way to fool your body into thinking you're safe, so it doesn't get into a fight or flight response while you're eating is to chew your food slowly and thoroughly until it's liquid because your brain stem, the base of your brain, is always monitoring the environment to see, "Is this dangerous? Do I actually have time to chew and swallow my food, or do I need to run because something is going to kill me?"

Your brain stem, it's very simple-minded. It's very primitive. And it's just always thinking about that sort of thing and trying to control heart rate and breathing and all these other things.

And so you can fool your body into thinking you're safe, so that it will allow your parasympathetic nervous system to get the gastric acids flowing, to get the pepsin flowing, to get the mucus flowing, to get the pancreatic enzymes flowing, everything working, and motility working, if your body thinks you're not about to die.

And your brain stem really responds to that. If you're chewing your food really slowly, it figures, "Oh, this person's got all the time in the world. I guess there's no predator around. I guess we can really focus on digestion" instead of fight or flight. "Let's get the hell out of here or kill whatever wants to kill us."

It shunts blood to the brain and the muscles in your arms and legs, so that you can do those things instead of having almost 50% of your blood pulling your abdomen, dealing with the food.

Dr. Sandberg-Lewis: It depends on your life. I'll tell you this. When I am in the middle of my day seeing patients—I've seen my morning patients, and I go and I take a half-hour to eat, or 40 minutes to eat, when I first sit down, the food's there, it's ready, I first sit down, I have to check in with myself.

A simple way to do this is just to get a sense of, "Am I feeling the chair that I'm sitting in against my body? No, I'm still hovering, I'm just tight."

And so what I'll do is take a few easy belly breaths again, again, thank you, Kayle Sandberg-Lewis (his wife) for teaching me all these things over the years, and then I'll just sit—I know how to meditate, so I'll just do that for even one or two minutes until I feel my body settle down, where I can actually feel like I'm supported by the chair. Then I know, "Okay, now I can eat."

Also, another really simple thing you can do that's very effective, if you don't meditate or want to do this in addition, you just think of one or two things you're really grateful for. Grace before meals sounds like a religious thing, and I guess it is, for some religions, but it's also—they came up with it because they knew it was good for digestion, and heart math, the folks that study parasympathetic tone, and the way that you can encourage it, they say that feeling a **sense of gratitude is one of the most potent ways to stimulate the parasympathetic nervous system**.

So, I just sit down, and I think, "I'm so glad I have all of my four limbs, and they all work. I'm so glad that my patients keep coming to me, and we have this great time interacting and helping them."

It could be the simplest little thing. It doesn't have to be complicated.

Dr. Sheila Dean: So, if you've got a lot of stress going on, and you're not really sort of being mindful, and you're sitting here and you've got all this negativity while you're eating your food about what he said or what she said, something that happened at the office, and then you eat too much, and you're not realizing it, all these things—going back to that brain-gut connection—can affect the way you digest.

So, it's what you eat, it's how you're eating it, the mindfulness that's involved. It's how quickly you're eating it. Are you chewing your food? It's all these different factors.

And I want to acknowledge that this can be very, very tricky to deal with because eating is so primal. I mean, the first thing we did when we were born was, we ate. And so, to try and make these changes, I want to acknowledge to our listeners that it is tough. It is tough.

Dr. Ritamarie Loscalzo: Yes, so food spacing it's one of my pet peeves because a lot of people are being told that they should be eating every two hours because of their insulin problems and their blood sugar. It's actually the worst thing you can do for that and actually if you're overweight the worst thing you can do is eat every two hours because you have a constant supply of insulin in your system. But when I discovered about this migrating motor complex, I'm like okay, here's yet another reason, right. Space your meals. Leptin is another reason. A lot of people develop leptin resistance which is that satiation hormone that gets secreted by your fat cells. And somebody says well I make plenty of leptin, why am I not satiated? It's because you've secreted so much leptin that the cells become resistant. Spreading the meals out more is actually more balancing for that. You get a triple whammy when you spread your meals out. It's good for your SIBO, it's good for your blood sugar and it's good for your waistline.

Dr. Mona Morstein: And remember, with SIBO, you know, we do want meals. We don't want the snacky time and we want to fast from dinner to breakfast. We need to get people to have bigger meals, so they have the calories to not have to snack. And anyway, snacking is the worst way to eat. Grazing, I always have been completely anti-grazing as a way to eat.

Dr. Mark Pimentel: So, diets are really important for IBS. And they have been shown to be important clinically and scientifically. There's the low FODMAP diet, which probably many of you have heard of; there's our low fermentation diet which is often used; and many others.

But they talk about *what* you eat. They don't talk about *how* you eat.

Now, think about the migrating motor complex for a minute. We've really discussed this a little, the cleaning wave of the gut.

So, let me start again and say it in a different way.

The intestine of the gut has two computer programs like a switch. You're either in eating mode or you're in cleaning mode. So, when you eat (or the moment you put food in your mouth really), you switch to eating mode. And that means you've switched off the cleaning mode.

So, let's say five minutes from now, you were supposed to have a cleaning wave, but you just decided to have two bites of a bagel. Done! That cleaning wave isn't coming because you're now in eating mode and those mechanisms shut down completely. So, if you put a bite of a bagel in your mouth every half hour all day, you'll never get a cleaning wave because you're always shutting off the cleaning waves. You're keeping yourself in fed state or eating mode.

It's only when you leave spaces of no calories, no food between meals that you allow the cleaning waves to happen.

Dr. Pimentel: Now, in people who are perfectly normal who don't have IBS, you get plenty of cleaning waves at night—maybe four or five because you're sleeping, you're not eating. And maybe that's good enough for people who don't have disturbed cleaning waves. And maybe you can nosh or nibble all day, and it won't really impact you as much.

But in people who have a dysfunction of the cleaning wave, you want every cleaning wave you get because that will help you keep the remission or keep the disease in check.

So, we recommend spacing meals, meaning eat breakfast, then four or five hours, zero calories. You eat lunch, and four or five hours, zero calories. Let whatever cleaning waves happen in you happen naturally and that you're not blocking them from happening.

We sit at our desks and offices, and we've got candy there. We've got bagels in the break room. We've got so much snack stuff around us that we're always tempted. And that just disturbs the cleaning wave.

Shivan: What do you tell people when they're like, "I just like a little midnight snack right before I go to sleep." Is it eating right before bed okay?

Dr. Farshid Sam Rahbar: Well, all my patients know what I say. I tell them, "It's good for my business." You're basically going to put the guts at work for digestion while we're going to sleep. That tends to suppress the motor migratory complex and the housekeeper function. So, it becomes a set-up for overgrowth of bacteria and maybe some other scenarios. I do not recommend it.

It also increases the risk of gastroesophageal reflux disease at night. And so, it's a major concern. I tell them the two hours before you go to bed is a no man's land. You need to respect that.

Dr. Mark Pimentel: Yeah, intermittent fasting is taking off. The challenge—and I'm going to say this in a crass way, and then I'm going to sort of jump into reality. If you never eat, your bacterial overgrowth will go away. But that's not life. You have to get food and nutrition. So, the more extreme your diet, the more likely the bacteria are to go down. But the more extreme your diet, the more likely you are to create disturbances in the microbiota in your nutrition.

So, we now know that the low FODMAP diet which has been proven to be beneficial in IBS, and even reduce hydrogen on breath testing, it's not nutritionally balanced in the long run. And even the people, the proponents and the scientists from Australia who work on the low FODMAP diet, they're very careful to encourage people to liberate the diet after three months so you're not all fully restricted on it.

It also reduces microbial diversity. That's been shown recently. If you reduce microbial diversity, that's believed to be associated with risks for diseases. So, we don't know what we don't know. That's a term I use quite often. And we don't know what the long-term effects of restricting calories in that way.

But I would say that intermittent fasting has some benefit potentially. So, if you can fast for 12 hours a couple of times a week, that may allow your cleaning waves to occur more often and may be beneficial. It hasn't been studied. Hypothetically, it sounds like a good idea and possibly could work. But again, it hasn't been studied.

Dr. Susanne Breen: Intermittent fasting, oh my gosh, so awesome!

Shivan: If you pick what time to eat, like you're going to eat in this certain window, go ahead—just take us through. Isn't it like an 18-hour window or a 16-hour?

Dr. Breen: Yeah, and you can choose. I mean, the big idea out there is to do the 16—16 hours of no food. And I've done that before. I just found myself thinking about what I was going to eat during that small window of time. (I don't have time for that!) but the benefits of intermittent fasting are incredible. They did find in a study not too long ago that you can do the 16 hours, but it's just as powerful to do just the 24-hour one day a week too.

So, find what works for you is the bottom line. I mean I have patients who did a 16-hour one and they are just doing incredible. It's been a big life-changer for them.

Shivan: So, no food for 16 hours. Your kind of sleeping through part of that. And then, the rest of the time, you can eat pretty much whatever you want.

Dr. Breen: Yeah, yeah, according to what your body needs and dictates for you. And that's all we really need. It's true. Our bodies love to have a break, so whatever it is.

Shivan: We were talking before the cameras were rolling. You just finished a 13-day fast.

Dr. Breen: Yeah, I did. Yes, I learned a lot. I learned a lot. I've been dabbling in fasting for years now. And it has been an incredible experience, let me tell you—up's and down's. It's not the easiest thing to ask people to do, but I have never felt so empowered in my entire life.

Shivan: I can tell...

Dr. Breen: Yeah.

Shivan: I can tell! So, what is it that we can—what are the benefits? First of all, what is fasting? And then, what are the benefits?

Dr. Breen: Okay, so there's a lot of different definitions of fasting. And of course, abstaining from food is the simple definition. There are so many different ways to fast. So even if you have an underlying chronic condition, and you're like, "There's no way I can fast," there actually probably is a way for you to fast.

And this last fast that I did was broth and juice fast. And I was able to work the entire time. I saw patients. Any time I got a little bit hungry or tired, I could just drink my broth or my juice, and it just got me through. And I realized that if you can get through the first three days, your gold!

And what's three days for somebody who's been sick for years, right?

So, I really started fasting because I wanted to reset. I started a relapse of SIBO coming on. Something stressful happened in my life. I was eating the wrong diet and I was eating whatever I wanted to. I always struggled with these strict diets. And it's never our intention to have to be on these for very long and we know that it can be harmful to be on a restricted diet for too long.

So, in my eyes, I was thinking, "Let's fast and just get this over with." And sure enough, it really did reset. It will knock SIBO back—not just SIBO too. I mean so many of us have underlying fungal, viral, other bacterial infections. And they feed on our food that we feed them. And so, we are starving those guys, not just SIBO bacteria but...

So, in a sense, we're treating other underlying infections. And then, when your body is not working so hard to break down the food that we give it—and not just food, the chemicals, additives, just everything that goes along with our American diet here. Our bodies spend most of its energy breaking that down. And I found out how truly powerful it is to give your body a break.

And you can struggle for a few days when you start the fast. But after the third day is when I really started seeing the magic happen and the true tissue healing can start.

So, your body has cleared everything that you've put in it three days before (it takes a while depending on your transit time). And then, like I told you earlier, I would wake up in the morning in a good mood. That was my first like, "Oh, my gosh! This is incredible."

Dr. Breen: I've never, never woken in a good mood... ever! I need an hour. I need to drink my tea or my coffee. I need to slowly take a shower. I don't want to talk about anything too important or intense in the morning.

And I woke up going, "Good morning!" My husband was even saying, "Who are you?!" And I realized that it actually helps to balance your neurotransmitters. I started really digging into the research there of what really can happen. And then, of course, that big study that just came out about diabetes. They just fasted for 24 hours one day a week, and 50% of them either reduced their medications or completely went off of them. So, diabetes, cholesterol... I mean, you name it. The different systems of your body are all benefited by this.

But you know, I'll also say that every time I fasted, it's been different. So, if you fast, and it's a terrible experience, don't give up. I even remember the very first time. I'm like, "Oh, my gosh! I'm actually going to do this. I'm going to fast" and I started. I think I got into an argument with my husband. And so, emotionally, there was no way I was going too fast. I wasn't going to be angry and mad and then starve myself. So, you have to be emotionally prepared.

And it's okay to fail. I mean I failed so many times on my fast, I didn't get through it. And then, that one magical time when everything fell into place, I got the broth and I got the juice, and I saw that I made it through the first day—you can do anything for a day, right? And sometimes, you'll have a hard time on the first day. But then I did the next day, and I would say probably the second and third day, your body starts going into a little bit of revolt. And you can get a little cranky.

But the next time I fasted; the first three days were easy! So, you've got to just because it depends on what's happening and what you've been eating and all of that good stuff. So, don't give up. Try again because you're going to hit magic one of these days.

Shivan: What about coffee? How do you feel about coffee?

Dr. Ilana Gurevich: Coffee is a tricky one. If you had asked me ten years ago, I would have said it was bad, bad, but now they've done a lot of studies on coffee and coffee that's organic and free trade in moderate amounts actually seems to be a good antioxidant and relatively anti-inflammatory.

I am not opposed to coffee in moderate amounts. If you want caffeine, I think you're going to get more health benefits out of green tea than you are out of coffee, but that's because the Japanese have been researching green tea longer than the Westerns have been researching coffee. I like green tea more, but I'm not opposed to coffee.

Dr. Morstein: On my handout it says, "weak coffee is okay," a cup a day, but no. I mean, look. If people are drinking coffee and they're getting 10 ounces, 12 ounces, that is gonna work against the gut, obvious. It's acidic. It's irritating. If they have a diarrhea SIBO, right? Coffee, caffeine stimulates peristalsis action. And also, it drains the adrenals. **It interferes with good sleep.** "Oh, but, doc, I just have one cup before 9:00 in the morning!" Yeah, well, who says that? There's no law that says it's detoxed. You know, coffee detox, coffee tends to wake you up at 3:00 a.m. The liver clock, the liver time on your Chinese clock. This is your time people wake up cause they're on a drug that their liver's gotta detox, or they took some caffeine at, right? And then you wake up kinda wide awake, right? If they handle a cup or two of their, of a weak coffee, all right. That's fine. But. I don't think a lot of it is going to be helping them in all of these different wants that we're trying to get them to be healthier.

Dr. Ritamarie Loscalzo: A couple of controversial things that I get into disagreements with colleagues on. Number one, coffee, okay. Coffee is stimulating. A lot of people are dealing with adrenal fatigue and they drink coffee to keep them up. Yes, there's the bulletproof that's supposed to be fungal free but most coffee that you go and get at Starbucks there's a lot of fungus on those beans–funguses, aflatoxins and other things. Not good for you. It thins the digestive lining. It actually thins out; the caffeine thins out the digestive lining. The caffeine will stimulate phase one liver detoxification but won't do anything for phase two. People start to really like oh, motor up and get phase one stimulated and then phase two just lags behind. And so that's a problem as well. I'm not a fan of coffee.

Shivan: And are you a coffee drinker or better yet should we be as patients?

Dr. Gary Weiner: Well, I don't like to generalize about that because I think a healthy body can enjoy coffee. I think coffee is a problem for many sick people. I don't consider coffee a healing agent for sick people. Why is that? Many reasons. The methylxanthine, the acids in coffee can be very difficult for a bowel.

For people with SIBO, coffee is often used almost as a laxative. It stimulates that. Now that could be good to move the bacteria out if it's constipation predominant diarrhea or there's an interruption motility to the point where the bacteria are kind of stuck in the small intestine the coffee could be good. But in general, I think if consumed to excess it taxes the adrenal glands because it's so stimulating and that can be a problem. Very reasonable use of coffee is really a great thing. Now there's the Bulletproof coffee, which adds some protection as it were and some positive attributes to its negative ones. I think it's overused.

Shivan: Like an excuse	to drink all you want?
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Dr. Weiner: Right.

Shivan: Right. Well, I will not be offering you coffee at this time.

Dr. Weiner: l'd love a cup!

Dr. Mona Morstein: Yes, I prefer grain free, potato free in the first phases. When they get through the phases, then we can start adding white potatoes, white rice and etc. Do I think that everybody needs to avoid grains? Hell, no! Hell, no! Not at all! I would love to come up and debate nutritionally. I feel very comfortable with debating. There's nothing the matter with having grains. Now, what about in a person who exercises, is a good weight, you wanna have some brown rice at dinner. How can that be a problem, right? Now, if you want to get into, "Oh, since we added grains 10,000 years ago, we've always been sick." Really? Because as I understand going through history, in the last 10,000 years, people that have been eating grains built the Great Wall of China. They built all of the Egyptian pyramids. Uh, Andrew, Alexander the Great conquered the world eating grains. The Romans ate grains, conquering the world. The Aztec empire, they ate corn. Machu Picchu, they ate corn. It's not like people have been sitting around since we invented grains and getting

overweight and sick. All of the history that we still visit, that we still look at today was done by people eating grains. Now, however, okay? If we're talking about gluten, here's the deal with gluten.

Historically, we ate corn and wheat which is innately lower in gluten, and we prepared it with mother's yeast. Now, mother's yeast is the yeast you had in your kitchen that you had to feed, making sourdough. When you take that wheat, when you use this yeast, it breaks down all the gluten in the bread. All of it! And I have studies on this.

Now, what happened in the '20s is that, I guess, women, you know, were jitterbugging and we wanted to break out of just being home in the kitchen making meals all the time. We're liberated! We're voting! Wow! So, they invented baker's yeast. Now, baker's yeast is great yeast for making bread, but it doesn't break any gluten down; and what happened in that whole 1900s is that we all decided, "God, I love pizza!" and "God, I love noodles!" And we need to have wheat that is higher in protein to have that happen. They hybrid protein, which is not genetically modified. Hybriding has nothing to do with GMO foods in any way, shape or form. We just we just took a trait that we liked which is protein and just kept planting more and more protein wheat. So now we have higher protein wheat and a yeast that doesn't break it down; and what you do when you start doing that is then you wait 50 years.

Dr. Morstein: Whenever you make a change in nutrition, you know, you wait 50 years; and then we start seeing people now sensitive to gluten because we're getting a lot more gluten in our guts because we have higher protein grains with gluten, and they're prepared with a yeast that doesn't break it down.

Does that mean everybody is sensitive to gluten? No. Does it mean it seems like there are definite people and a lot of people? Yes! This is a new thing in the gut of humanity, at least in America, and around the world; and it just depends genetically. Is it a real problem? Is it a more and more frequent problem? Yes! Should we in general avoid gluten? I don't think we in general have to avoid grains as a whole. Right? I don't believe that, and the thing is, here's the deal: You have a low-carb diet, a grain-free, low-carb diet that has protein and fat in it. There's a good study showing guess what? This can negatively affect the microbiome. It can really affect the microbiome and turn it into, for example, you're going to likely produce less bacteria that make short-chain fatty acids. Well, what do short-chain fatty acids do? Well, in your colon they help prevent against colon cancer. They're the main food of your colon cells. In my SIBO patients, yeah, I'm pulling out the grains; but really by Phase 3 or 4, I'm adding quinoa back in. I'm adding millet back in, and I don't see them having problems with these grains; and now, now you can get fiber from vegetables and fruits, but you're getting a lot more fiber with this guinoa that people can add in and since it's a seed, almost invariably, my patients are okay with it.

Dr. Michael Ruscio: We want to motivate patients to buy books or undergo programs or watch documentaries—which is good on the one hand. But we don't want to "fear factor" them into being compliant or motivated to get them there.

Shivan:

Ultimately, do you think the fear really works anyway?
Dr. Ruscio: I don't! I think it's a short-term motivator. I don't think people are motivated in the long-term. And that's why when people say to me, "But we need these labs to motivate patients," **my experience has been if someone is not motivated, and you tell them, "If you eat this food, you're going to cause all these inflammation for months on end, blah-blah," they'll follow that advice for a little while. But very quickly, they're going to go back to what they feel to be how they want to live their life.**

And so, what I would rather do, rather than extrinsically motivating someone with fear, is coach them through, "Okay, let's tighten up your diet for a little while to see how good you feel. And then, because you're going to probably want to do this anyway, let's have you re-introduce... and you'll probably notice a lot of these foods are okay. Even a lot of these foods the Internet says are bad are okay. But there's a couple, 'Ugh, I really didn't feel well when I eat those.'"

And then, they're going to be intrinsically motivated to avoid those foods. And they're going to be intrinsically motivated to avoid these foods to the degree to which they have a reaction.

So, if you're really gluten sensitive, you will probably be very avoidant of gluten. But if you can get away from eating gluten, then you'll enjoy a slice of pizza with your friends every once in a while and not be hindered by an indoctrination-based avoidance of the food.

Shivan: And that ultimately frees up a lot of energy.

Dr. Ruscio: I myself was afraid to eat gluten for probably four years of my life. I just wouldn't eat it. And then, there were a few chances where I may have been out with some friends late, and the only thing open was a pizza place. I was so hungry at that point, I said, "Well, I'm going to have something because I'm just famished."

Shivan: You walk in, and there's a mist of flour in the pizza places. You don't even have to eat the gluten on the pie. You're breathing it in.

Dr. Ruscio: And I was fine! And then, I did some reflecting and some reading, and I come to find that, yes, non-Celiac gluten sensitivity is a published, legitimate condition. And anyone who says that it is not is not looking at the evidence objectively.

So yes, there are people who do not have Celiac who have a problem with gluten, absolutely. But that ranges—at least according to the best available evidence—from 0.6% of the population to 6% of the population.

Shivan: Wow!

Dr. Ruscio: And there was one study performed in Italy that looked at over 12,225 patients. It was a multi-center trial in Italy. And they found that 3% of that population had non-Celiac gluten sensitivity. Some people criticize that data because

it's in Italy, it's not in the US. But in the US, the estimates range from 0.6% to 6% of the population. Why is that relevant? It doesn't mean that I'm telling people not to try a gluten-free diet. But what it means is that if you already have foods that you know bother you, let's say you're really FODMAP sensitive, but maybe you do well with some of the FODMAP-containing grains, or maybe some of the lower FODMAP grains, then I want you to be able to eat those. And we don't want to indoctrinate you because there's so much press around gluten-free to think that you can't ever have any gluten.

Now, do an elimination. And then, later, do a re-introduction. If you have gluten, and you have a really bad reaction, okay, be careful. But if you're like a good percentage of the population, you can have some, or you have no problem at all, and you can have a lot. I don't necessarily recommend it as a dietary staple. But you want to be careful not to create hurdles just based upon dogma.

Dr. Lisa Shaver: So, people talk about gluten allergy. And that actually doesn't exist. Either you have a wheat allergy, or you have an autoimmune reaction to wheat (and that's Celiac disease). And we're not quite sure what non-Celiac gluten sensitivity is. It's either a non-true allergy food sensitivity or what we call a non-IgE sensitivity.

IgE is that true allergy, the child who can't eat peanuts, your friend who can't eat shellfish. This is a true allergy. And there is a true wheat allergy. And what's interesting is bakers have a really high rate of wheat allergy. So, there's something about constant exposure.

And we know that allergies run in threes. So, food allergy goes along with eczema and asthma. Those are kind of like a trio that we see. And so, bakers' asthma is a big thing. They're breathing in this flour, right, because as you pour flour in, it goes into the air.

Dr. Peter Osborne: We're entering a realm and an age of personalized medicine, functional medicine. And for many people that struggle with SIBO and IBS, the reason they struggle is gluten. For some of them, it's not gluten. For some of them, it's FODMAPS. For some of them, they have a bacterial infection in their intestines. For some of them, they have bacterial overgrowth. For some of them, they're getting exposed to way too many pesticides. Some of them are deficient in vitamin B5. Some of them are on antacid medications and it's wrecking and destroying their immune system's capacity to protect their gut wall.

So, there are a lot of different reasons why a person might suffer. And to make any kind of blanket statement, to say that no one in the world should ever eat gluten ever is really, in my opinion, isn't scientific to say that. So, we've got to take it from the angle of personalization.

When it comes to gluten, the number one thing that should be done is the person should be tested. And the best way to get tested is genetic testing. And the reason why genetic testing trumps every other form of methodology of testing is because gluten sensitivity is not a disease. So, the myth or misconception is that if you don't have Celiac disease, you don't have to worry about gluten because people use the term Celiac disease synonymous with the term "gluten sensitivity." And they're not the same thing.

We can make the statement that everyone with Celiac disease is gluten sensitive. But not everyone with gluten sensitivity will develop Celiac disease. But they can develop other diseases.

So, if we understand the premise that gluten sensitivity is not a disease, but it's a state of genetics, you either have the genes or you don't, if you have the genes, and you eat the gluten, your genes will react to the gluten by creating an inflammatory response that can create gut dysfunction and multi-organ dysfunction, not just gut. It's an equal opportunity destroyer. It doesn't just affect the gut. And for many people, it doesn't affect the gut at all.

So, understand that gluten sensitivity, again, is not a disease. It is a state of genetics. That's why doing genetic testing to discern whether or not your body perceives gluten as a foreign invader is the best way and to understand whether or not going gluten free is the right move to take.

Well, if your genes are the type of genes that look at gluten as an enemy, if you surround them by gluten, then your genes are going to produce inflammation to try to protect you from that gluten.

Dr. Osborne: That's not illness! It's a genetic response just like choking underwater is not illness, you'd get out from underneath the water, and you make a full recovery.

I think if anybody listening can walk away with one thing about gluten a day, it's really, truly understanding that gluten sensitivity is not a disease. It's a state of genetics. If you have the genes, you definitely want to avoid gluten. That's prevention. Don't wait until you have three, four or five different forms of autoimmune disease, SIBO, inflammatory bowel disorders, irritable bowel disorders—before you make a decision on changing your diet to eat healthy. Honor your body and learn how to learn healthy based on your genetics. And that's, again, part of why we do that.

Jennifer Fugo: No. I have a really tough time with the amount of food demonizing that our culture, and even the health industry that I am in, has perpetuated. I think it is wrong to be afraid to eat food. And listen, you could sit here and point fingers and go, "Jen, you don't know what it's like." I do know what it's like. The last time that I ate eggs, I almost drove myself to the emergency room because I thought I was having a heart attack.

I kid you not. At this moment, I have three duck eggs downstairs in my refrigerator that I bought a month ago at the farmer's market because I have been told repeatedly by Dr. Terry Wahls and a bunch of other health experts that I have talked to, and their colleagues of mine, "Try duck eggs. Duck eggs might not bother you," but I'm afraid to eat them. So, I understand what it's like to be afraid to eat something because of how violently sick it is going to make you feel, or for many days, you will just not be a functional human being. I get it.

But I think that our culture focuses too much on demonizing food. So, yes, there are issues with gluten (which we can talk about what gluten does to us). But some people are able to digest it, and they're okay. I think we eat too much of it. I think there's things that have been done to wheat in the United States. There are a lot of questions around its safety. I'm not going to go into all of that. But I'm not going to sit here and say, "Gluten is the devil." I think that's actually a really wrong way to look at it.

And I also will say this. If any practitioner is putting you on a very restrictive diet, and it's where you're now becoming so afraid to eat things, and you're losing weight, and you're becoming really malnourished, you need to find another practitioner because you should not be made to feel afraid of food. You need to work with somebody that's going to help empower you around food to make better choices to create a diet that is appropriate for you, i.e. the Jen Diet. For Shivan, it's the Shivan Diet. And it constantly changes and shifts.

But please, whatever you do—because I'm really saddened by the number of clients that come into my practice who are afraid to eat anything, and it's the result of what happens online. So, just be cautious of that.

Rebecca Coomes: The first mistake or challenge that I see people make and experience is thinking it's all about food—and only about food. So rather than seeing that your diet and your nutrition is one of many components of recovering your gut health, they just focus on food because it's one thing we can control as a SIBO patient.

What I commonly see is people get fixated on what they're eating, or what they're not eating, a lot of fear creeps in, trepidation around reintroduction of foods.

I myself experienced that. I was so scared to come off the very restrictive SIBO diet I was on and to start eating other foods. I was terrified of things like bananas. And you know, a banana isn't a bad thing. It's just perhaps the quantity you ate or the time that you ate it. And I didn't appreciate how what we're eating and our tolerance to it changes as we go through the SIBO diet. So, what you can tolerate today doesn't mean that's all you will ever, ever tolerate.

And we know that food can be delicious. It's our life force. It's our nourishment. And if we're stuck eating the same 5 to 10 foods for years, how can we expect our microbiome to recover and be healthy and diverse?

Shivan: Okay, not all about the food. I like it!

Rebecca Coomes: It's not all about the food.

So, it just goes to show that just because you have SIBO doesn't mean you need to be restricted forever. And because I've had a real focus on overall health and healing

my gut, that has, I believe, made a huge difference this time around with my SIBO and what I could eat. And it makes life a lot more interesting when you can eat more food.

So, for those who are watching, don't give up because you can get greater diversity. Just keep putting one foot in front of the other, and you will get there.

Trudy Scott: Don't feel sorry for me. I feel empowered that I have got control of my life. If I wasn't making these dietary changes, and I wasn't removing these foods, where would I be? I would be going to the doctor to say, "Give me something to help me," and I probably would be on medications. And I might have worse anxiety. I might have worse digestive issues.

So, I just feel that diet gives you power and it gives you control. And in the meantime, I'm still looking for answers.

Dr. Michael Traub: The part of self-care that SIBO really is feeding yourself, right? Most people in my experience are pretty good about following the SIBO dietary guidelines. But it's not easy for everybody and sometimes you need to make exceptions to those guidelines. Dr Siebecker talks about how these are just guidelines; these are not rules. They can be bent, and they can be broken.

The important thing is for people to avoid the foods that aggravate their symptoms and to eat foods that don't aggravate their symptoms. And those don't always comply with the guidelines. So, it has to be individualized.

The other thing that Dr. Siebecker says that I've learned is that you need to ask patients when you ask them to follow this diet "What is it that you're really going to miss?" and maybe allow people, if it's not a really strongly offending food, to eat a little bit of the foods that they really are going to miss if they don't eat any of them. So, I think that you have to be practical about the dietary advice.

Episode 5: Food Is Medicine: How Diet Can & Can't Heal Digestive Disease

Shivan Sarna: How can diet help SIBO?

Dr. Allison Siebecker: Very good basic question we have to talk about because it's very important as we go through our treatment with SIBO. It helps in three main ways. First of all, most important it helps the symptoms—the symptoms of SIBO. And primarily I mean here at first the gastrointestinal symptoms. The bloating, diarrhea, the constipation, pain, farting, burping. On and on it goes as we know unfortunately. The reason it helps those symptoms we'll get to in one minute. But that's the really important thing to know. The main reason we use diet in SIBO is to reduce the symptoms. Diet is one of the best tools we have to reduce the symptoms. It's also one of the best tools that patients have because they do it at home. They can take control. It's empowering if viewed in the right way to help them feel better.

Now related to that is the second reason it can help and how we use it. And that's for the maintenance of remission, the prevention of relapse. It's two ways of saying the same thing. In that phase when you've gotten your SIBO cleared but you want to be sure it doesn't come back diet is a very important prevention for maintenance.

And then lastly it can help with non-gastrointestinal symptoms such as systemic symptoms and overall health. There are a few circumstances where maybe it's not helping with someone's overall health but for the most part these, in general, are low carbohydrate diets and low carbohydrate diets are famous for helping people feel better. It doesn't seem to be able to help cure SIBO or eradicate the bacteria. It's not a primary bacterial treatment for SIBO. Now why does it exactly help SIBO? Because the why is so important especially because these diets are not super simple in terms of compliance. The why is very important for motivation.

Dr. Siebecker: And it's so key to understand because if you know why then you don't have to worry so much which diet if you understand the principles. The principles are that bacteria's primary food are carbohydrates.

Let me actually explain what carbohydrates are in case somebody doesn't know. That's a medical term for sugar basically. And we think of sugar as like the white table sugar but medically nutritionally it refers to a macronutrient, one of the three main groups of food. There's carbohydrates, protein, and fat. And carbohydrates are the sugary type foods. And so, some of these foods escape our notice because we don't think of them as being sugar-based in the end. And so, here's what all the carbohydrates are. Vegetables, fruit, grains, nuts, seeds.

There are carbohydrates in like bone broth that comes from the skin and bones as you make them. There are carbohydrates in dairy products and that would be the lactose.

And then of course carbohydrates are what we think of them as which is like actual sugar. Honey, things like that. Sweeteners. And I think I've covered most of them.

Dr. Siebecker: It's an entire macronutrient. It is some of the most sought after, desirable food there is that everybody loves. I mean even if you're being very healthy about it, it's vegetables. It's a key point here is that a lot of desirable extremely healthy foods can now cause problems in SIBO. Let me explain how.

Since bacteria eat carbohydrates, the medical term for that would be ferment. When they consume them, they turn them into acids and gas, most bacteria do. The gas that they make is what causes the symptoms. Now what is really happening here is the fact that the bacteria are translocated—improperly located higher up in the small intestine. It means that they're right there where our food comes in. We swallow it, it goes into our stomach and the next place it goes to is our small intestine. And in the stomach, it's just sort of starting to get broken down chemically. Then it goes into the small intestine and that's where all the real heavy lifting work of digesting, breaking down and absorbing which is taking into the body a curse. And that's where the bacteria are. They're right there. They get exposure to all those carbohydrates we may have eaten, and they can ferment them into gas and cause the symptoms. That's it.

Shivan: It's very mechanical and basic science.

Shivan: When you're getting into the phase of killing the bacteria that's overgrown, diet... is it enough at that stage?

Dr. Siebecker: I haven't seen it. I haven't seen it be enough. I mean what I haven't seen is I haven't seen diet be the only treatment for SIBO and remove the SIBO. I haven't seen it. I'm hesitating because I want to see it and I'm like um, has anyone seen it? I would love to see a case, but it just doesn't seem to be enough. We seem to need to do more than just reduce their food and starve them. We need to actually kill them more aggressively to remove them out. I think the reason for that is because the bacteria they can eat the carbohydrates that exist on the lining of our small intestine. And they do actually. There are studies to show that they do that. They actually break down our own digestive enzymes which are made partly from carbohydrates that sit along our intestinal lining. It's just a terrible circumstance and that's another reason why we get some of the symptoms we do is due to the damage that the bacteria inflict upon our small intestine lining.

There are a lot of diets that are used for SIBO. A lot of diets can be used for SIBO. Any diet theoretically that reduces carbs could be used. But there are some that are better for it than others. There are a few diets that have been formulated specifically for SIBO. Four that I can think of. There's the diet that I put together that is the SIBO Specific Diet or SIBO Specific Food Guide. Then there's a variation of that called the SIBO Bi-phasic Diet that my friend Dr. Nirala Jacobi put together. And she just took my diet and put it into phases. Then there's the Cedars Sinai diet that was put together by Dr. Pimentel. And then there's Dr. Robillard's Fast Tract for IBS diet. All of those were formulated specifically with SIBO in mind. And why don't I go through them and then I'll tell you the other diets that one can use. Okay. The SIBO Specific Food Guide or SIBO Specific Diet I put together because I was using some of the other diets. Just briefly I'll mention them. It's the Specific Carbohydrate Diet that I was mostly using and that was not formulated for SIBO. And I could see that in the folks who were doing it that didn't have SIBO, they were getting better results than what I was seeing in my SIBO patients. So, I could tell it wasn't the perfect match for SIBO. And then there's this other diet a lot of people have heard of, the low FODMAP diet. And that had incredible statistics from studies showing that it reduced the symptoms of IBS.

And when I looked at them, I could see that they could go together very well because they actually were targeting kind of opposite things from each other. And I thought well

goodness, if we brought these two together, we'd get more things covered. And in particular the low FODMAP diet took a look at vegetables.

The Specific Carbohydrate Diet said pretty much all vegetables were okay except for the starchy ones. I'm generalizing a little bit. But you get the gist. And the low FODMAP diet said actually we need to look at all these vegetables and some are more fermentable, and some are less fermentable. And that was so helpful because my patients were reacting to a lot of the vegetables. They were reacting to a lot of fruits such that they weren't even eating fruit. I thought gosh, if we brought these together maybe I'd get better results. And that's what happened. I brought those two together and then I added a few of my own little clinical things.

Shivan: Portion control. So just because the...

Dr. Siebecker: I should have mentioned this before. This is actually the third pattern and I'm so glad you brought it up. The third pattern for all SIBO patients with diet is that portion size or amount of food matters and makes a difference. And that's just because of how much carbohydrate is going to be there that's fermentable. It's really interesting because it's the opposite of what most of us have learned in terms of food sensitivities because most of us know about the blood tests that are done for types of food allergies and food sensitivities.

And that's an immune-based reaction where even a small amount can trigger the immune system to have a symptom. A good example would be celiac disease. Maybe the most extreme example but a speck of gluten that isn't even visible to the human eye can trigger the immune system. Even the immune system can perceive it. Even if our eyes can't. And the immune system will then create symptoms. That is not the model in SIBO with the fermentation and gas. Here, the amount matters so you could have a small amount. You could have a speck and have no symptoms. But if you had a lot you might have symptoms.

Angela Pifer: So, to me, when we look at the history with the diet, at the start, a few years back, most practitioners put people, most of their patients with SIBO, on a low FODMAP diet or even the SIBO Specific Diet at the time which combines the FODMAP and SCD.

Now, we have Dr. Lisa Shaver, Dr. Allison Siebecker. Everything's shifted a bit. The diet is now not a diet, it's a food guide. And so, we're looking at this as a food guide. These are foods that are more likely to cause digestive distress. If you have digestive distress, you can look at these as a guide to kind of start to pinpoint some food. They're not meant to go as a laundry list of everything you have to pull.

And no matter how many times it's said now—and even in the first five minutes of the SIBO Symposium, this was said by Dr. Lisa Shaver: Diet doesn't treat SIBO, it only calms down symptoms. It's going to take a really long time to turn the freighter around in the ocean, right? It's going full speed the other way. We've got to stop it, turn it around and get it back.

Angela Pifer: It's going to be difficult to do that because the diets everywhere online, and more mainstream doctors are treating now, and so they're just going to hand that diet out. The FODMAP map diet is becoming a favorite amongst some GI docs. They're going to keep handing it out. And it's not being used as a 2- or 3-week tool. It's a "Here you go!" And then, people at home are getting stuck on this six months, nine months, two years. And that's not what it's meant to do.

Dr. Sheila Dean: Yeah! Well, first, let me say that there's a lot of different approaches to gut health. And the FODMAP approach, or the low FODMAP diet approach is a very popular approach just because, like you said, there's just so much empirical data. There are so many testimonials to the fact that it works. And there is some research. The research is fairly limited, but there's just so many people that testify to the fact that they do well.

So, FODMAP is an acronym. So, it's not food map. It really is FODMAP. And it's an acronym that stands for—get ready—fermentable O for oligosaccharides, D for disaccharides... Disaccharides are basically two sugars—the word di-, the prefix di-, and then the saccharide refers to sugar. So, when you stick two sugars together, we call that a disaccharide. And you might see that in things like milk sugar. So, milk sugar is a disaccharide like lactose.

So, we've got, let's see, fermentable oligosaccharides, disaccharides, M for monosaccharide (which is just "one sugar"), and then P for polyols. Polyols will be things like sorbitol or mannitol (which more people might be a little bit familiar with you know, you see these things in like sugar-free gum or sugar-free mints and even in some medications where they're trying to avoid the use of regular sugar or even corn syrup).

So, when you put that together, F-O-D-M-A-P, FODMAP, that's how you get the acronym. And that's what it stands for.

Dr. Dean: So, a low FODMAP is basically a 2- to 6-week elimination diet where the goal is to remove foods that are considered high FODMAP to assess whether these foods are actually problematic for the person with this altered gut problem like IBS.

Shivan: And what are some things that are on the low FODMAP diet? So, wait a second! Fermentable, when I think about people bloating, I think about fermentation and sort of poofing out. So, this can help with reduction of that...?

Dr. Dean: Well, the thing is, these foods are fairly small. And what happens is, when they get into the intestines, they kind of draw water into the intestines and make you kind of blow up like a water balloon. And so, you feel really uncomfortable like you're about to pop.

And in people with fast moving intestines, fast motility, in those people, foods that are high FODMAP will cause diarrhea. So, it can actually cause anything on the spectrum, from constipation to bloating all the way to diarrhea. It just depends on the person and their unique genetics and their unique physiology.

So, the idea is that, if we remove some of these high FODMAP foods—so examples of what's considered to be high FODMAP would be things like wheat, barley, rye, apples, pears, mangoes, onions, garlic... you know, there's a whole list. And actually, there are some wonderful apps and wonderful websites. It will give you the whole lists. So, these things are easy to look up.

Phoebe Lapine: One of the most common dietary approaches to treating SIBO is the low FODMAP diet. So, this is an acronym that basically stands for various fermentable carbohydrates.

And these carbohydrates aren't necessary the enemy for everyone. In fact, a lot of them are your large intestinal bacteria's favorite foods. The problem with SIBO is that it's a locational issue. So, you have bacteria in the wrong place. And when it goes to town on some of these carbohydrates, it produces gas; and therefore, the signature bloating and distension that you see so often with SIBO.

The tricky thing though about the low FODMAP diet is that it's not kind of a black-andwhite approach. In fact, it's a lot more about quantity than the particular ingredient itself.

Shivan: When it comes to a low FODMAP diet is that trying to create less fermentation in the intestines, so they don't expand as much?

Dr. Siebecker: Yes, so the situation with all SIBO diets is the sort of the undercurrent to understand here is that all carbohydrates can be fermented by bacteria into gas. And fermentation is just the medical word, the technical word for bacterial eating. They're just eating and then we call it fermentation. And there's different types of fermentation that have different end products.

We're all familiar with the type of fermentation that makes alcohol. Yeast will ferment carbohydrates into alcohol. Bacteria ferment into acids and gas. Yeast can make some gas too. All of these diets what they're trying to do is just reduce the overall carbohydrate load so that there's less carbohydrates to be fermented into gas and then that will lower the symptoms because primarily it's the gas that's causing symptoms.

There are some other things but that's the predominance of symptoms that comes from that. The thing about the SIBO diets is that there's no one right way to approach the reduction of the carbohydrates because the right way would be to remove them all if we wanted to have no symptoms at all. And then that wouldn't be very good because then we would have no carbohydrates in our diet which is undesirable and unhealthy in many circumstances. What these diets are doing is they're just fiddling around deciding, based on theories, which ones they want to remove. And so, they're all going to have varying degrees of success because they're not removing them all. But I do just want to say that they're amazing. All of these diets are amazing. Their success rates are anywhere from 60 to like 90 percent, really incredible. The success rates of the antimicrobial treatments that we use for SIBO are the same. Diet is right up there with it. I mean it's one of the best tool's patients have for managing their symptoms when they have SIBO.

Dr. Norm Robillard: And the good news is, with diet, guess what? You can not only deprive the small intestinal bacteria excess carbohydrates; you can do the same thing with the large bowel.

And they've been doing it for years. We just haven't been calling it that. For instance, in the early 1900s, they already knew about lactose intolerance. The doctor says, "You know what? You shouldn't have lactose. Give up the dairy. At least don't have much lactose. And it will help your stomach pains and cramps and diarrhea." And sure enough, it worked.

We've been doing that since the early 1900s. And then they started doing the same with fructose in the '70s and the '80s. So, these were carbohydrate intolerances, sugar alcohols.

And there's lots of studies showing that those avoiding those individual carbohydrates was very helpful. And that was before they knew anything.

Dr. Mark Pimentel: The low FODMAP diet is unhealthy. Now, some of your viewers may not like me saying that. But even those who purport the low FODMAP diet or discover the low FODMAP diet recognize that you have to have a reintroduction phase because it's going to hurt people over time potentially. And the first abstract ever that describes this was presented at the American College of Gastroenterology about a month and a half ago where they showed the people who were sustained on a low FODMAP diet for more than three months started to have measurable nutritional deficiencies.

So, you can't stay on low FODMAP forever, period.

Angela Pifer: What we also see is when people go on a low FODMAP diet that short chain fatty acid production reduces. And so, basically, we've got this beautiful symbiotic relationship with the microbiota. We're never going to drain our small intestine. We're supposed to have microbiota there. It's just that, for IBS patients, it's more of an osmotic shift that's occurring; for SIBO patients, it's more that they've got too many organisms in the small intestine.

When we're looking at this, if you put somebody on a low FODMAP diet as this next study did, 2016, they basically looked at the low FODMAP diet for four weeks. And they saw that short chain fatty acids go down. Short chain fatty acids, basically, when I consume carbohydrates, my microbiota consume those fibers that I can't break down and break apart, bonds that I can't break down, and they use them. And the byproduct of that is short chain fatty acids. And short chain fatty acids fuel my gut lining. They are supposed to be there. We've got the symbiotic relationship. We need them. It's beautiful.

We'll drop all that fermentation. But what they found goes up is protein fermentation. And so, our microbiota has the ability to ferment branched chain amino acids. It's a certain type of amino acid within the protein makeup. And when that happens, they do that further down on the colon.

We get this false sense of "I'm calming symptoms down. I'm doing better. SIBO is getting better," and yet we can cause more dysbiosis, and we can shift fermentation to protein—because all the protein has to go if you're dropping carbs. And that isn't good for the colon. We have to look at things as a whole.

Angela Pifer: And full disclosure, I run a website that has a low FODMAP, moderate FODMAP diet recipe set on it. So, I'm not opposed to people modifying some of what they're eating. But the whole reason that I created that is because I want people to eat more variety. I don't want people to look at this list and say, "I only like 10 foods on there. that's all I'm going to eat." I want to give them easy opportunities and ways that they can create more sauces and prepare food in a different way and expand. It's not about "go on this diet to restrict and starve anything out."

So, I know the FODMAP diet well. And we have to be very clear, based on the studies and what's happening here, on how we're wording things.

Shivan: And it goes rampant. And it's a game of telephone. There's a lot of miscommunication about it online.

Bottom line is use it as a tool to help manage your symptoms. And expand where you can. Expand as quickly as possible as you can. Sometimes, you may deal with some symptoms, but your microbiome ultimately will thank you. And chances are, depending on what it is and how you are, the more you diversify, the more your body's theoretically going to be able to handle it.

And look for your underlying cause because then, if you can deal with that, your whole diet, and probably your whole health, is going to open up.

Jessica Drummond: If we look at all the evidence, the best way to optimize the diversity in your microbiome—and you want it to be as diverse as possible—is to eat a wide diversity of foods and phytonutrients and fibers, which is challenging because we're telling these people not to eat anything, right? We're kind of like, "Don't eat this, don't eat this, don't need this."

They're only eating yogurt and chicken breast. We're losing diversity.

That's why these short-term Low FODMAP diet, Specific Carbohydrates Diet, Paleo, anything, elimination diets are helpful because, first of all, you do have to get rid of junk food. You've got to stop drinking Diet Coke and eating yogurt. That's just not going to help. You've got to get the junk out. You often do have to get rid of sugars and grains—processed grains, but sometimes all grains for a while, soy and things like that, but we do want to, as quickly as possible, diversify those fibers so that people are diversifying their microbiota.

When we're talking about SIBO, we've got to do that slowly because, otherwise, you're going to get bloating, or you're going to have a recurrence of the SIBO. I'm sure, as you know through this summit and Dr. Siebecker's great work, this is a balancing act with all patients. We have to think about what their priorities for healing are. There isn't one quick fix.

Dr. Mona Morstein: Well, resistant starch is a kind of starch that, when we mean resistant, it's resistant to being digested in the small intestine, and so it winds up in the large intestine, being fed to the beneficial bacteria there.

Historically, resistant starch was used for type 1 diabetic kids who would go low during the night. And if they ate some resistant starch, they would have a very slow, steady, blood sugar level during the night.

But really, otherwise, in medicine, we're not really using much resistant starch as a packet that you can buy in the supermarket or so.

Resistant starch, there are some foods that contain it. These are generally grains, rice, some legumes.

Shivan: What about a green banana?

Dr. Morstein: I was just going to say green bananas. So, these have some resistant starch. I don't know why anybody would be worried about these.

Look, here's the deal with food. I have my five-phase food intro, but the idea is, honestly, if you eat it, and it's fine, it seems to be fine. If you eat it, and it's not, then you're not ready for it—at least right now.

If you can eat a green banana, which is, on some diets, fairly early added in because it is so low in disaccharidases, unlike really ripe ones, and you're like, "Wow, I ate that banana, and I didn't notice anything," these are not problems that I need to go through. I don't need to create problems out of food that individuals do not have problems with

Dr. Lisa Shaver: So, let me just digress briefly and talk about food sensitivities.

Shivan: Okay.

Dr. Shaver: That is not a food allergy. One in ten Americans have a true food allergy. A food allergy is you eat it, and you get an immediate reaction. You get itchy—which could also be histamine. But anyway, let's go back to food sensitivities—or your tongue swells, or you have problems swallowing...

Shivan: Like anaphylaxis?

Dr. Shaver: Not quite. So, anaphylaxis is potentially life threatening.

Shivan: Okay.

Dr. Shaver: So, an IgE true allergy could be problematic. When we think of food allergies, we think of the child who can't get near a peanut, somebody in the airplane opens a bag of peanuts, and that child 20 seats away starts having asthma. So, asthma is a symptom, respiratory problems. And then, like hives and itching.

And then, the end, really dangerous point is anaphylaxis—so anything in between.

But a little caveat is, with food allergies, you can have nausea, vomiting, diarrhea, abdominal pain. A lot of people think that their food sensitivity is a food allergy. So, food allergy is immunoglobulin E. That's part of our immune system, IgE, immunoglobulin E.

Okay, let's get back to food sensitivities. Food sensitivities is an immune reaction, IgG or IgA, so this immunoglobulin. And food sensitivities can show up as any symptom under the sun. You could start from the top of your head and all the way down—itchy scalp, headaches, migraines, eye pain, drippy nose, post-nasal drip, clearing your throat. That's super common.

Dr. Shaver: Yeah, yeah. I hear people and I'm thinking, "Umm..." or something like that person walking down the street, they're like [spitting sound], producing extra mucus, that's inflammation. I mean it could be sinus too. But chances are inflammation, I think, "Wow! That guy has a food sensitivity." Usually its men doing that.

So, any symptom—going down palpitations, a little difficulty breathing, chronic cough, somebody who kind of feels like mucus coming back up their mouth after they eat, joint pain—any symptoms—PMS is worse or menopausal symptoms are, eczema, skin rashes, urinary issues, prostate issues...

Shivan: All from food sensitivities?

Dr. Shaver: All could be food sensitivities.

Heidi Turner: Histamine is a chemical that our body naturally produces every single day. We are producing histamines right now. Histamines are involved in

about 20 different biochemical chemical processes. They help us to build estrogen. They act as a neurotransmitter, a hyper-excitatory neurotransmitter in our body.

We usually kind of think of histamines in terms of like allergies. So, they do help to kind of modulate the immune response when we need it. And they're involved in our circulation. They're also involved in our digestion—which I know we're going to be talking a lot about today. But they help us to build stomach acid. And they help with that—dietary, I'm sorry, a digestive focus as well.

So, they are a really important chemical within our body that is very tightly regulated. So, we build histamines via a particular enzymatic pathway. And we use them up, and then we break down histamine via an enzymatic pathway.

And when all is going well and happy, everything's great! That system is regulated well. And our histamines are doing what they should do.

Shivan: Okay. And when they're not...?

Shivan: They're great until they're not...

Heidi Turner: They're great until they're not. They're still great. We don't want to villainize the histamine.

Shivan: No... namaste histamine.

Heidi Turner: Or we might get more gut symptoms, right? So, if we have a lot of histamine within the gut, we might get more abdominal pain. That's a really common symptom when we're working with histamines. We might get more of that bloat. And we might get more diarrhea. Those are the three more common symptoms when—and heartburn, I guess. But those are the more common symptoms that we might see when we're working with some level of histamine dysregulation.

Shivan: Okay. Okay. How can we get heartburn from it? That's really interesting. I've never thought of that or heard of it.

Heidi Turner: Histamine builds stomach acid.

Shivan: Right, right. Actually, that's the first time I've ever heard of that, too. You just like, two minutes ago said that. So that's really, really interesting.

Heidi Turner: Yeah. It's one of the precursors, too, absolutely.

Shivan: So, GERD patients, reflux patients need to really pay attention to this.

Heidi Turner: Absolutely. Yeah, absolutely. You know, there's some situations where we're not making enough acid that could be more problematic. And then, there's more issues where we are making too much acid where that's going to be problematic.

Shivan: Would a proton pump inhibitor get involved with histamines at all then? Or that's not...?

Heidi Turner: Yeah, it's going to hit a different part of that acid-producing process. So, it's not going to block histamine so much as it will get in the way of the hormone making that stomach. It is a whole thing.

Now, this is when we move into dysregulation. When this system is dysregulated, the issue becomes that these mast cells just start doing their thing in not the fashion that they should. They just start exploding in various parts of the body and start flooding the body with histamine and these immunomodulators. That's a problem.

Imagine, if you just have this, say, allergy, and you're sneezing all the time, and you get all the puffiness and the congestion and runny eyes and all of that, imagine that happening throughout the whole body. Now we start to see...

Shivan: That's a great analogy.

Heidi Turner: Yes!

Shivan: That's great.

Heidi Turner: That's not going to feel good. So, we're going to start to see just more generalized inflammation. And where that exerts is dependent upon the person. And why that exerts itself, which is the big million-dollar question, is going to be dependent upon the person as well.

Heidi Turner: Then we move forward to the diet, which we've talked about. Like implementing low histamine diets, that's a great place to start; low FODMAP diet has been shown to reduce histamine in the body as well. So, if the bacteria in your gut are contributing to your histamine load, then just by reducing their fuel can help to reduce histamines in general as well.

Sometimes, you have to do a low fermentable, low histamine diet, which is a very complicated diet to follow. But that can also be very beneficial.

So, dietary manipulation, I would say. Your first question was: "What can I do?" Consider taking histamines out of the diet and see if it makes a difference. And then, the dysbiosis itself. So, if you have a lot of gut issues, something's up. And we need to be really considering that—getting breath tested, getting stool tested. Does a probiotic make you feel better, or does a probiotic make you feel worse? Typically, those who have histamine intolerance issues don't do well with probiotics in general.

Shivan: Can you just explain what an elemental diet is?

Dr. Michael Ruscio: Sure, sure. So, an elemental diet, you can think of a meal replacement shake that's super gut-friendly and hypoallergenic.

Shivan: It's like

It's like instantly absorbed basically.

Dr. Ruscio: Yeah, and that's why it's gut-friendly, is because it's very quickly absorbed. And it can starve SIBO. And they can work very well for gut inflammation.

Shivan: But you also say that you could even use either one of those as a meal replacement or as a snack throughout the day.

Dr. Ruscio: Yes, this is kind of an interesting backstory. Well, interesting is all relative, I guess.

But in the clinic, we were having patients use an elemental or semi-elemental diet. I'll just use the word "elemental" to encapsulate both for ease of discussion. But they would do very well while they were on it, and then they'd regress slightly when they came off.

And so, I said to myself, "Well, why not have them use one elemental shake or maybe even two elemental shakes a day replacing their meals, and then having a normal dinner?"

And for some patients doing that for a few weeks, and then slowly weaning off worked really well. And when I was writing Healthy Gut, Healthy You, and we went through an exhaustive review of the literature on this, we found out that some researchers were using this and calling it a hybrid application, or a hybrid use of the elemental diet.

And there had been some research studies using 50-ish percent of one's calories per day up to three to four years. And some studies, they've actually shown that the health outcomes in the people who are getting 50-ish percent of their calories per day from these newer places were actually healthier than the people who were not.

And so, it was nice to see that what I stumbled into clinically just through being pragmatic was something that a few researchers were using and showing a lot of benefits with.

Now, that's not what you do for everyone. But let's say you've done all this stuff. You're feeling a lot better. But every time you eat three meals a day, you just feel like you regress?

Now, one approach would be just to have two meals a day and intermittent fast. That's another discussion. But some people don't do well with intermittent fasting. They get hungry. They get tired. They get light-headed. They get brain foggy. So, they need some kind of calories. And if we can give them a liquid calorie that's gut-safe, then that can give them that break you get from the fast, but not give them the metabolic starvation that you get from a true fast.

And so, this person does all the gut stuff. They're feeling a lot better. But they can't do three meals a day without feeling that they regressed. Is it that big of a deal for them

to have an elemental diet shake every morning on their way out the door like most people do with smoothies anyway? Not that big of a deal.

And so, some people—and coming back to our theme of hope—it's just identifying these small techniques that can bring you from "I keep regressing" to "I feel great!"

And it doesn't mean that "Oh, my God! There's so much wrong with me." It's just we need to figure out another little tweak to your plan to keep you healthy in the long-term.

And for some people, the hybrid use of an elemental diet can really achieve that nicely.

Shivan: And so, is the reason why the elemental diet works is because your nutrition is absorbed before it gets down there?

Dr. Gary Weiner: That's what happens. Proximal or up top absorption so that these bacteria die off so with antimicrobial herbs and antibiotics we're killing. The Rifaximin is killing hard and the herbs are killing me softly. And then the elemental diet is not killing at all its starving, in other words the sugars are absorbed, everything is proximately absorbed and there's some residue, of course, but that's how it works. Inflammatory bowel disease interestingly–let me back that up. Since we're talking about those overlapping circles and you have IBS and IBD and they're intersecting because we think that they are existing from a certain point of view on a continuum rather than being discreetly separate entities that the elemental diet not only reduces SIBO and can resolve IBS in patients where SIBO is the cause, but the elemental diet can also induce remission in Crohn's disease.

Shivan: That's big.

Dr. Weiner: It hasn't been proven to reduce remission in ulcerative colitis, those certainly there are cases where it's helpful and works. The interesting thing is that the elemental diet, the proximal absorption and bowel rest, which is what it creates, doesn't seem to be the main mechanism of how it decreases inflammation and actually the mechanism of the diet to decrease inflammation is purely speculative. And we know that it does do that but how it does it? Is it the nutritional effect or does it change the microbiome? Is it that it creates bowel rest and rest helps induced a remission? Is it that nutrition is available because the vitamins and minerals, amino acids and fats, fatty acids are absorbed so readily and easily does that cause the remission?

Dr. Mark Pimentel: So, the elemental diet is very good at getting rid of bacterial overgrowth. And how the elemental diet works is that you take food fully balanced. Most of the diets that are used for this are 100% RDA (recommended daily allowance) of vitamins, minerals and all the things that humans need. But they're in their simplest form so the human can absorb and digest it immediately.

And so, it's sort of like you're getting all the calories, and the bacteria is not getting anything. Now, when I say that, patients are like, "I'm getting all the calories. That

means I'm going to gain weight." That's not what I'm saying. You're getting all the calories you've just taken—which is your daily requirement for nutrition and health. You're not taking more calories than you normally would. It's just you're getting them all instead of sharing with the bacteria.

And so, by restricting calories to the bacteria, the bacteria basically die of starvation. And like anything else, it takes time to starve to death. And the number that seems to be ideal is 14 days.

Dr. Pimentel: So, if you're on an elemental diet and you cheat, that's a problem. I have patients who say to me, "Well, but coffee is neutral. It doesn't have any calories in it." And I said: "Look, I have 3000+ patients with the elemental diet. I have not studied 3000+ patients with elemental diet with coffee added." So, what I would hate for a patient to do is go through the elemental diet for two weeks and drink coffee every morning and it didn't work. And then we're scratching our heads wondering whether that coffee screwed it up.

So, with these diets, either you're in or you're not. Can you imagine being on a liquid diet for two weeks, and because you just couldn't do it, it didn't work? It's miserable for two weeks. So, you've got to either commit or not.

And I know that sounds very radical or very cold, but I'd rather you not suffer for two weeks if you can't make it. And it's expensive as well, so that's harsh.

Shivan: What's the best advice that you have for anyone who's on the fence or who's like I don't want to do all of that antimicrobial through herbs or antibiotics, bring on the thing that has such a high success rate and what appears to be the least side effects?

Dr. Gary Weiner: I think the answer is–well it depends really on how much one suffers what one is willing to do. I think for simple cases Rifaximin can work very well. Botanicals can work extremely well. I think most people choose the drugs because they have an impression that they're going to be fast and efficient if they're coming from a pharmaceutical approach to their healthcare, whereas when people who are used to seeing naturopathic doctors who prescribe lots of herbs or people who fear drugs will pick the herbs.

Almost nobody picks the elemental diet except for a certain kind of personality who has already done the research. And if you look at the research, you're going to see that, at least in the Pimentel studies and the elemental diet studies that the reduction of the lactulose breath test fairly quickly. I often tell people who are on the fence that my experience is, and it is, that the most resistant cases to other agents the elemental diet, unless there's some other interrupting factor like Lyme disease or some biotoxin or biofilm illness that is still coexisting with the SIBO that the elemental diet has a really good track record.

And compared to someone using an elemental diet to induce remission of Crohn's disease where two weeks doesn't quite cut the mustard, you'll often see three, four, six in the hospital with a nasogastric tube on an elemental diet. I've seen studies

where it's taken two months, two weeks, maybe three... is not a lot of time and it's some suffering that's probably worth it if you have one of those cases of SIBO where you've gone through course after course of Rifaximin trying some other antibiotic pharmaceuticals then trying different herbs and it's not reducing. The elemental diet may be worth doing. Have I convinced you to do it?

Dr. Weiner: When you're ready to leave the diet to go slowly and carefully in the reintroduction of food. It's nice to follow some basic principles of starting out with foods that are well cooked and not going right into raw food because your digestion has had a break and so let's come back in slowly and work with your physician on something like that. So that may be peeling and deseeding, not going in with raw food right away more well-cooked foods and simpler foods in the beginning and then moving back into whatever diet you were going to follow for maintenance.

Dr. Mark Pimentel: And they literally say, "Every time I cheat, I feel bad. So, I know your diet is working."

And again, there are days where you're with your friends, you're with your family, it's Thanksgiving or whatever, and you're not going to behave according to the diet. That's okay because that's life. But you want to try and do it as much as possible.

Dr. Allison Siebecker: People ask us all the time, if they cheat, have they screwed everything. How much trouble is Thanksgiving?

Dr. Pimentel: Perfect! First of all, Thanksgiving is a disaster for everybody.

Shivan: ...for a lot of reasons.

Dr. Pimentel: Yes, weight gain between now and the next month. It's a disaster. But Thanksgiving is the highest time point of the year for food poisoning because the food is not properly cooked or it's sitting out for hours and hours and hours or days and days and days. We're eating leftovers, leftovers, leftovers. And so, it's

literally the worst time of the year for my patients. And I counsel them and counsel them. And inevitably, one comes back and says, "I got really sick during that time period." Anyway, it's a bad time.

But remember the morphine story I told you earlier. You have to be on morphine for two weeks to cause overgrowth. One day of cheating is not going to bring your overgrowth back. You may not feel great the next day, but it's not bringing everything. All the cards are not falling down. So just give it a couple of days. Usually, it resolves.

Angela Pifer: So, I think the problem is that anytime people eat FODMAPs and see a reaction, especially with SIBO, they think SIBO is getting worse.

Shivan:

It's a reasonable assumption.

Angela Pifer:	It is	but the syr	nptoms ar	re affected.	SIBO is	s not ge	etting
worse.							

Shivan: Right!

Angela Pifer: On the studies that we look at, three weeks or four weeks, six weeks on a high FODMAP diet, methane does not get worse and hydrogen doesn't go up. So, it's symptoms. And who doesn't want to improve symptoms?

Shivan: Yeah, everybody does.

Angela Pifer: It's the fear that is brought about by this, that the SIBO is getting worse. So, they're going to keep restricting and restricting.

At the SIBO Symposium this year, they had a nutrition track which was lovely. Half that track was around anxiety around food, fear around food, and eating disorders. And I'm not saying that everyone that's on a FODMAP diet has an eating disorder by any means. But when you put somebody on that restrictive of a diet, and they get on that for a long period of time, there's going to be food fear. There's going to be anxiety bred. And it's going to be disordered eating to a degree because all of that that's being bred.

Dr. Sheila Dean: It's difficult. And you know? There are so many different moving parts. And what makes it even weirder is that what's working now, now come back in like five years, and life has changed, circumstances have changed, and suddenly, you can tolerate this food, maybe you cannot tolerate this food. So, it's constantly evolving. And so, it's a moving target.

But sometimes, I think to myself, okay, when it gets a little bit too complicated, or at least I perceive it to be a little too complicated, sometimes, going back to the basics is the best thing you can do. And it actually helps remove a layer of complexity so that my mind is freed up and I actually can think better.

So, sometimes, this whole thing is much more than a science; it's like an art, just the art of knowing when to just pull back and go, "Okay, you know what, let's just look at the big picture here. Let's go back to the basics" because we're all just way too anxious about this.

And then, there's a time and a place to have to get a lot more detailed and layered. And so, it's that ebb and flow. It's knowing how to be able to gracefully go back and forth to basically, ultimately, get to our goal.

Episode 6: When Food Isn't Enough: Using Rx Meds & Natural Supplements To Heal The Gut

Dr. Michael Murray: And for many people, it's not a question of the food that they're eating—they may be eating very health-promoting food—the problem is they're not breaking it down. They're not digesting it properly.

So, when we help them digest their food properly, it's a life-changer.

Shivan Sarna: So therefore, the food wouldn't ferment in the gut as much or for as long because it's actually getting digested the way it's supposed to be.

Dr. Murray: Correct! The problem occurs when we don't break down food. It feeds gas-producing bacteria and yeast. And that causes a lot of bloating, indigestion, and being uncomfortable.

Shivan: That's a really sweet way of saying it.

Dr. Murray: So, if someone has irritable bowel syndrome (IBS), is there a particular set of digestive enzymes you would suggest for them?

Dr. Murray: Absolutely, yeah. Irritable bowel syndrome, the different variants of it, different types, different categories. Sometimes, irritable bowel syndrome is caused by some simple things—not getting enough fiber, not getting enough water in the diet. Most often, it's caused by improper digestion of the food.

We know that many people that have irritable bowel syndrome also have small intestinal bacterial overgrowth. So, if we can help people break down food better through use of digestive enzymes, we can go a long way in helping them improve their symptoms of IBS.

Dr. Murray: What we do is we mix different variants, different types of classes of enzymes so that we have complete protein, fat and carbohydrate digestion throughout the entire digestive tract.

Enzymes that we secrete in our body and that are made for commercial purposes generally have a pH range that's very narrow where they're active. We combine enzymes, so that we're able to select them so that they can produce high activity throughout the entire pH range.

This is important because your stomach is very acidic. Your small intestine is relatively neutral at the basics. And then, your colon is neutral as well. **So, what you really want is you want to have an enzyme supplement that's effective throughout that pH range.**

So, we have the higher potency enzymes combined to produce an effect that is able to basically break down food three times faster and six times stronger than any other digestive enzyme that you compare it to.

Dr. Mark Pimentel: So, there are natural enzyme products that are able to digest certain products in food.

Look, for example, lactase is a digestive enzyme. It digests lactose sugar for milk. And then, there's Bean-o (not vegetarian) which is a commercial blend. It digests some of the carbohydrates that are in beans. So those are all digestive "enzymes" that help break down food.

And then, there's papaya enzymes. And then there's pancreatic enzymes that you get as a prescription. Pancreatic enzymes basically are meant to represent the entire complement of enzymes produced by your pancreas to help digest food. The pancreatic enzymes, the full brand, the full amount, can really digest food a little bit better. But it's not going to digest it to an elemental diet level.

So, you can't say, "Well, instead of the elemental diet, I'll just take pancreatic enzyme." It's not going to get rid of overgrowth. It might make you 20% better or 30% better, but it's not like an elemental diet, unfortunately.

Dr. Pimentel: So, when I give enzymes, generally, I give prescription. And we do see in patients where nothing else is working, some benefit. There's no doubt it works a little bit.

So, HCl is complicated because—well, I'll tell you a couple of things about HCl.

Number one, it's believed that proton pump inhibitors cause bacterial overgrowth, but we're showing that that's not true... in deep sequencing... Yes, there's a couple of changes in the microbiome that occur. But in terms of triggering overgrowth, no acid, not true. Sorry, it's not causing overgrowth, at least not by sequencing, with the most modern technology. And we've shown in breath testing that it doesn't make the breath test go up either.

So, I'm not sure HCI does a lot. What HCI is meant to do or believed to do is to kill bacteria as it's passing through the stomach. And maybe that's more important for pathogens or food poisoning-type bugs, and not really all that important for the colonizers of the small bowel because once you have your warriors, the warriors that you like, in your small bowel, it's hard for others to sort of invade and start taking over. So, I'm not sure HCI is all that great.

But it's not wrong. It may not be bad for you unless you're methane. So, we do see that when you reduce—

Methane can use hydrogen as gas, or it can use hydrogen as acid. And what we see is that people who take a proton pump inhibitor have less methane. So, you say, "Well, can we treat methane with proton pump inhibitors?" And the answer is we haven't

done that study, but what we have seen is that if you're on a proton pump inhibitor, less people are methane positive.

So theoretically, if you're on HCL, you could fuel methane production which could fuel the constipation side of IBS.

Steve Wright: If you do Betaine HCL has been the number one supplement I've recommended for everyone. I've seen it be–it's one of these light switch supplements where if you've never tried like, for instance, three or four enzymes with a meal, try it. It could change your life overnight. Try Betaine HCL. It could literally change your experience overnight. And I've seen it happen thousands of times now. So, you find your dosage range. You'll probably have to find it by pushing too hard and then you'll have some pain. You can just take some baking soda; the pain will go away. Next time take one less than whatever you took. If it was seven, take six. And you'll finally be absorbing your amino acids again because your stomach acid will be at the proper strength. And here's the interesting thing.

The digestive system how it goes from start to finish is sort of regulated by many different signals. Like the valves, the sphincters have to know when to open and the enzymes and the bile and how long does it stay in the stomach versus small intestine and what areas. Well it's regulated by many different things and the number one regulator, at least it's what we assume at this point because no one really knows, is pH. If your stomach acid is off from the beginning. Go ahead and kiss the rest of your digestion away because it's not going to happen. And especially people with SIBO need to pay attention to stomach acid because it's thought that one of the precursors, one of the main precursors to SIBO is low stomach acid due to a nutrient deficiency, stress, h. pylori infection, something like that.

Typically, SIBO happens either after-well you have a lot of people who have already talked about this, but I think one of the main ways it happens is first infection which also downregulates your stomach acid during the infection. Or prolonged exposure to some of these things downregulates stomach acid which allows an incomplete breakdown of food which means more foods are available in the small intestine. And then it's just like throwing a dollop of peanut butter on the sidewalk. Like life is life. Life will show up to get rid of that peanut butter. It could be a dog. It could be ants. It could be a raccoon and ants and a dog. The same thing is going to happen to your small intestine. You keep throwing dollops of peanut butter in there because your stomach acid and your digestive enzymes aren't correct. Life is going to show up to take care of that. I think stomach acid and I think Betaine HCL is a huge part of healing for everybody with a chronic issue.

For those people who are on apple cider vinegar, that's cool. I think it's not doing any harm. If it's working for you, great. But I have found that when people switch to Betaine HCL if they figure that out, if they're willing to go there, they typically see even better results than apple cider vinegar. And then I would say for those of you who are having really bad heartburn who are really struggling here number one, cut your carbs total out down to 50 grams a day. Duke University has done a study, they've done a bunch of studies showing that low carbohydrates close to ketogenic levels is a huge way to take care of that Betaine HCL.

And then if all else fails like, for instance, if you overdo it with Betaine HCL which I've done. Like, for instance, you want another way to really get a bunch of pain in your stomach, take a zinc tablet when you think it's like a B vitamin on accident. Oh god, you will pay for that one. What do you do when you have those instances and you're a bio hack or you're a DIYer, baking soda. So just take baking soda. You're going to be pretty good even with several different half teaspoons or something like that. Within a short period of time, you'll survive and that's probably the fastest way to get rid of it. The other thing you can do is if you are getting those burps and you've taken five Betaine pills you can take a sixth one even like 15-20 minutes later and a lot of times that'll go away.

Steve Wright: I used to try to take it in the middle. I've tested it in the beginning. But if you just think about the physiology, the way the physiology works is that the food gets chewed and it starts stimulating the gastrin and all these juices. And then slowly over time inside of the stomach – this is my stomach model here. Inside the stomach the pH is going to get more and more acidic over time. And the reason why is that acidity is slicing up the bonds on the food particles. If you take it after your meal that's essentially when the acid levels would be rising anyway. I tell everybody enzymes, HCL, totally cool afterwards. No need to rush them. Take it with as small of water as you can. Because that's just kind of how the physiology works.

Dr. Nirala Jacobi: So, here are some suggestions for healing leaky gut. Something called n-acetyl glucosamine is a nutrient that's very specific for intercell communication. So glycocalyx, that's that sort of branching protection that covers the epithelial layer, how cells communicate with each other.

Certain amino acids, there are three that are very specific mucosal support. Glycine is one of the smallest amino acids. It's very, very easy to obtain. It's also helpful for liver detoxification. But it's an important basement membrane amino acid for glutathione production.

GSH stands for glutathione. And it really is also required for gut detoxification. When we think about the different phases of detoxification—for those practitioners in the audience, we hear about phase one and phase two detoxification—that does not only occur in the liver. That also occurs in the digestive tract in many cells of the body. So, we have to be mindful of that, that very often, our patients are glutathione deficient because, for example, they have either gut inflammation, they have oxidative damaged, they eat a lot of foods that have pesticides and eat a lot of foods that have glyphosates. These are foods that seriously disturb the microbiome, but also, really depleted your glutathione in your gut.

Glutamine is probably the most famous of all mucosal repair nutrients. And it's an amino acid that is very helpful for us as a fuel for epithelial cells, particularly in the small intestine. And if you think about you slough off your cells every 48 hours or so, you do require a lot of nutrients for cellular repair if you have a lot of inflammation. Then we move to probiotics that also help with mucosal repair. These are very specific probiotics that are associated with mucosal repair. Saccharomyces boulardii is a beneficial yeast that specifically increases secretory IgA which is your immune response in your gut.

It's very helpful to help you fight invaders. It's also anti-inflammatory. And it helps with villus repair. So, villus repair is the small microvilli that line your intestinal tract.

Dr. Nirala Jacobi: Tight junctions are the zipper-like structures that exist between these epithelial cells. And in the tight junctions is the zonulin and so forth. And so, to really repair those, we need things like vitamin D, we need vitamin A. And Quercetin can be very helpful in this process as well.

And zinc carnosine is something that I use a lot of. It's a particular type of zinc that is coupled with carnosine. And it helps with mucosal repair—especially gastric mucosa. I use it a lot for gastritis, for ulcers, and also for general epithelial cell repair in the digestive tract.

And then, L-glutamine gets another special mention here because it has so many different beneficial functions on the digestive regeneration process like increasing glutathione, it's a major fuel source, it supports tight junctions. And it reduces these inflammatory cytokines that your immune system generates when it's inflamed.

Shivan: Tell us what colostrum is in case someone doesn't know.

Dr. Tom O'Bryan: The first three days of mother's breast milk is not milk. It's colostrum. It's the first three to five days. And colostrum, the job of colostrum—it has many jobs, but one of its jobs—is to turn genes on in the gut.

See, when a baby is in utero, baby is loaded with intestinal permeability. It's normal because baby's swimming in this mom soup, right? And the soup just goes everywhere—in the eyes, in the nose, mouth, down into the gut, and through the gut into the bloodstream. It's all interacting because mom's body is getting rid of the waste as baby's body is growing. And it has some exhaust to get rid of.

So, intestinal permeability is normal in the fetus... normal. So baby is born with severe intestinal permeability. That's normal.

But it's colostrum—that's what babies are fed immediately—it's colostrum that turns the genes on the gut that says, "Okay, gut, time to close those tight junctions now. Here come the probiotics. Here's the good bacteria. Let's build some receptor sites, some docking stations for the probiotics to set up shop here because these are the guys that are going to protect you for the rest of your life."

See, mom passes the lineage of the family tree down to baby through the probiotics, through the birth canal. The bacteria in the birth canal in most of a woman's life is hardly identifiable for a bacterium called prevotella. But in the last month of pregnancy, it's dominant. It's like, "Where did this come from?" But it's dominant. Prevotella carries the DNA code of mom and mom's lineage.

Here's the ratio of the bacteria that you're going to get coming down the birth canal. So, let's start building the receptor sites in your gut for these. Receptor sites are like docking stations so the bacteria can live here and thrive and protect you. So, that is all happening as baby comes down the birth canal. Colostrum then turns the genes on to activate all that stuff. The interaction of the bacteria from the birth canal and colostrum, that interaction, turns on the genes to build the docking sites and to protect baby, to build that. Seventy percent of our immune system is in the gut. This is where it gets programmed what kind of a gut immune system are you going to have.

So, children that are born by C-section, unfortunately, have a detriment. And they're at a deficit. For the rest of their lives, they're at a deficit. And there are of course many things to do to build a good, healthy microbiome. But the birth process is normal.

That's the job of colostrum. One of its jobs is to turn on the immune system of the gut, to close intestinal permeability (turn the genes on to close intestinal permeability) and to feed the good bacteria so they could colonize and flourish because the good bacteria protect you from all the bad stuff we're exposed to all the time.

So, when patients have gut symptoms or they have intestinal permeability, we give them colostrum for two months.

Shivan: From cows?

Dr. O'Bryan: From cows, right. And people say, "Well, I have a dairy allergy." "Mrs. Patient, we just found out that you've got a dairy allergy. It's real. And it's not good. So, get all the milk out of there, get the cheese out, get the ice cream and yogurt and get all that stuff out of there. But I'm going to suggest you try the colostrum for two months. Let's turn the genes on, as many as we can, to be a catalyst for this whole healing mechanism that, once you turn it on, it will take off and run for you."

"Now, if you have any symptoms, any bloating or any gas or just any cramping or something, just stop right away." But the vast majority of our people who know they have a dairy sensitivity, they can take this colostrum. It only has 0.6% casein in it. And that's the most irritating component of milk, casein. It's 0.6%. Most people can take it without any symptoms. And we say for two months.

And for those who don't have dairy allergies, I take it every day. For the rest of my life, I'll take it every day. Now that I've read so many studies on it, there's no question.

Shivan: more time?	Very cool! Okay, tell me the name of the colostrum one
Dr. O'Bryan:	GS Immuno Pro.
Shivan:	I'm going to go there right now and get some.

Dr. Allison Siebecker: There's several layers that we can aim our treatments at. I would say the top layer is the symptoms. And of course, we want to get somebody feeling symptomatically better as soon as we can. And this is in regard to SIBO, it could apply to other diseases but specifically SIBO. The next layer down would be the bacteria. That's the actual SIBO, the accumulation of bacteria in the small intestine aiming at eliminating those bacteria. And then the bottom layer would be the underlying cause of the SIBO. And that's really where most of us probably want to focus our treatment because if we can get rid of the underlying cause well then, we can get rid of SIBO and we can cure it, but that isn't so easy.

Dr. Megan Taylor: The other big piece that I noticed for my patients who are really in the journey is not getting access to the right treatment. And I say, "right treatment," but it's kind of a loaded term. I don't mean that there's a perfect right treatment out there for everybody—there isn't. It's not a one-size-fits-all approach here in this SIBO world. It's a "unique to you" kind of approach in the SIBO world.

And what often happens is I see patients who had either treatment with a single antibiotic, and they really needed a dual antibiotic treatment; or they've been treated with the same thing six times, and it never really helped, but they're still doing it because their test is positive; or they were treated with herbs at very low doses for six months at a time—these treatments that probably might have worked for some people, but weren't right for them.

And so, really being able to say, "Gosh, this isn't really working. I think I'm going to go get maybe another opinion or get some additional advice," and then using these resources to know what kind of treatments are typically used when it comes to SIBO.

Dr. Siebecker: So, the problem with SIBO is one of the big problems is that a lot of the true underlying causes of SIBO we don't know how to correct, or I guess we could say they're incurable. It's hard to think that. People work on all of these incurable things very hard to try and get us answers and fix these things, but there are just things we don't know how to fix yet. Some examples would be diseases that would cause SIBO and cause these underlying causes like systemic sclerosis. That is considered an incurable progressive disease. Some of the structural alterations that can be occurring in people to give them SIBO—recurrent SIBO. Sometimes there's surgery that we can do and sometimes there isn't. Sometimes they can't be fixed.

One of the main most common reasons why people get SIBO is from food poisoning and then it damages their nerves in their small intestine and it slows their migrating motor complex. And it's triggered by autoimmunity, it's an autoimmune triggered condition and we have no known corrections for this. And Dr. Pimentel and has been working with his team on this I think for more than ten years. He's devoting himself to find a cure for this, a solution, but we don't have it yet.

So probably the majority of people with SIBO this is not the answer they need, and we don't have it yet. In fact, an article came out in 2016 by these preeminent gastroenterologists and SIBO clinicians' doctors Pimentel, Rau and Rezaie and they said in there, I'm going to look at my quote. "In the majority of cases, elimination of the

underlying cause is not possible." And the reason that I'm saying it that way quoting it is because there are a lot of doctors that are working very hard with their patients on SIBO and patients can get really angry at their doctors, why aren't you fixing my underlying cause? Why aren't you going to the deepest layer? For those of us who are in the alternative world and focusing on that. And it's kind of helpful to know that some of the best of the best are saying it's often in the majority of cases not possible. Now that's kind of a bummer, a big bummer so we just need to know the lay of the land and what we're dealing with and to know that there are people working on that.

Shivan: Excellent.

Dr. Siebecker: And remember, even if we can't fix the underlying cause it doesn't mean there's not a lot of other things to do and it doesn't mean that your symptoms can't get even 100 percent better.

Shivan: Thanks for ending on that message of hope.

Dr. Siebecker: Because I see it. I see it. We all live with—we're not perfect. Life isn't perfect. We might have to live with something, but we can still get better.

So, how do you treat SIBO? What's your approach?

Dr. Gary Weiner: I follow the basic template that was outlined by doctors Siebecker and Sandberg-Lewis many years ago in terms of offering an antimicrobial strategy based on the lactulose breath test combined with a dietary strategy and a prokinetic strategy. However, I would add a fourth step, which maybe precedes those three, which is to try to identify the cause, which of course is a basic teaching of both those doctors and Dr. Pimentel. But it's really important because otherwise it seems if it's not addressed, that SIBO often recurs too easily. But the basic approach is to pick one of the three antimicrobial strategies that we know of and we always hope that one of those is going to begin to reduce the overgrowth and pick the correct prokinetic and pick a dietary strategy that's going to be both doable for the patient and be correct in terms of supporting the reduction of the overgrowth.

Shivan: So, the three microbial antimicrobial strategies are...

Dr. Weiner: Well, a pharmaceutical strategy, which of course is usually rifaximin in the case of methane predominant SIBO with constipation.

A second antibiotic or double therapy as it were that's often metronidazole or neomycin.

And then there's a botanical strategy using any variety of herbs, usually evidence-based from studies or those that have shown to work in one trial of them clinically after another. And then the so-called elemental diet. And sometimes I have a preference for one or the other, you know, a strong suspicion that one is going to work over the other.

Dr. Pimentel: So, methane SIBO is different. And the terminology of SIBO may not be exactly a fit for methane because part of the methane bugs are in the colon, part of them are in the small bowel. So, the term "small intestinal bacterial overgrowth" may not be a perfect fit for methane.

But let's look at it this way.

When the methane overgrows, we're sort of calling it a bloom or a blossom of methane. And when there's too much of them—you should be here—when you're here, it causes constipation.

The way we treat it is, because methane producers are not bacteria, we haven't really created antibiotics for archaea or these ancient bacteria that are the methanogens, but some of the antibiotics do work. But what we found is that a combination of antibiotics such as rifaximin + neomycin or rifaximin + metronidazole appears to work.

We have one double blind study that was published comparing neomycin alone with placebo to neomycin and rifaximin. And the two antibiotics together were far superior.

Dr. Pimentel: Here's where the problem comes in. The methane comes back quite quickly.

And so, even with those courses, even with that good benefit that we see, it's shortlived. So, we've been working really hard to develop—and we're in the middle of a clinical trial that we think will finish some time—

If you block methane production with a statin, particularly lovastatin in a form that's delivered specifically to the bugs and doesn't get absorbed, we can stop methane production.

Now, the question is, if we stop methane production, does it mean you have to be on this forever? The answer is we don't know. We have to do the trial. But we have seen some patients where when they get rid of the methane for long enough, a new world order occurs, and the methane doesn't want to come back so easily.

So, I think let's put the jury on hold for that until we get the trial done, so we know exactly if what I'm saying is true or not. But it's very promising, at least hypothetically.

Dr. Mona Morstein: There are three ways to kill the hydrogen and/or methane bugs. One is with antibiotic, prescription antibiotic, one is with natural antibiotics and one is with the elemental diet. Off the top of my head and I go over each of these with paper, with patients. But I honestly prefer the prescription antibiotics which I can prescribe in my state.

Now why do I like this medication? Because I just said five minutes ago that I don't use antibiotic or sinus infections or strep infections or bronchitis, why I like this antibiotic is because, for several reasons, one, it only works in the small intestine. It doesn't work in the colon, so it's not doing a big microbiome wipe out, that most other antibiotics do, right?

Two, it doesn't get absorbed through the intestines. Now they do say that the type, rifaximin in Canada is absorbed a little bit. But I have used it on so many patients, I have never had anybody have any systemic problem, allergic, it's so minimal I just don't think it's effective. I've never seen it cause problems.

But because it's not getting really well into the body it can't cause the damage that so many other drugs can once they enter the systemic system.

Three, we learned from Dr. Pimentel that it doesn't produce any kind of significant resistance. We should feel comfortable using this drug without thinking we're just going to make the situation worse and worse. For these reasons, I do like to do it.

Dr. Mark Pimentel: We've studied that. I mean, the whole target 3 trial—which the FDA required a microbiome element of study—found that the microbiome, 98% of the bugs that were there at the beginning are there in the end... in stool. We don't know what's going on in the small bowel.

In one small animal study, we do see that the microbiome of the small bowel changes which is exactly what we want in SIBO; but not the colon bacteria which is exactly what we want. We don't want to hurt the colon bacteria, but we do want to reduce the bacteria where they don't belong. And so, we're optimistic that it's not really damaging the microbiome.

So, again, it points back to studies that we've done. We did a study where we looked at one treatment plus up to five re-treatments. And it looks like once rifaximin works once in a patient, it almost always works in the same way.

Yes, maybe treatment three, not as effective. But then you do it again, treatment 4, and all of a sudden, it's effective again.

It doesn't make sense. Maybe the diet you were on when you were taking the one treatment where it didn't work. Maybe there was some kind of conflict with other things you were doing. But in general, if it works, it will work again and again. That's what we showed in that trial.

But the question is does it affect the microbiome long-term, long-term, long-term. The drug has been available for 30+ years globally. And despite all that information and all the information about bacterial resistance, we don't see it.

Dr. Pimentel: In the target 3 trial, the FDA also required bacterial resistance panels be done. And so, thousands of cultures from various parts of the body were done to be sure that rifaximin wasn't creating superbugs on the body, in the colon, et cetera. And it was basically clean.

Any resistance that did develop went right away after the drug was stopped.

And most particularly, which is important for women with vaginal yeast infections, yeast did not accumulate. There was no more growing yeast—meaning after three courses of rifaximin, you don't have more yeast in your stool—which is a good thing.

Dr. Siebecker: So, I think the reason we're having this detailed discussion is that a lot of people feel that their SIBO was caused by antibiotics and I'm sure that's true in many, many cases, they've been messed up by antibiotics, they're afraid of them, we all know we should take them unless we really need to.

But this antibiotic is not like all of those that we're thinking about all of that for. It is very different in its properties so in a way we almost shouldn't lump it into the regular rest of the categories of antibiotics. Which brings me to neomycin and metronidazole. Those are your typical antibiotics. All those things that we're afraid of that they can do bad, they can do, and yet we still do use them for SIBO in certain cases and a lot of gastroenterologists use them.

Where we need to use them is when somebody has constipation or methane shown on their test. Usually methane causes constipation, but occasionally you'll see a patient that has constipation and they don't have methane and still we will use it in those cases. They are your typical antibiotics. Now, neomycin is a little bit more similar to rifaximin in that it is not absorbed into the whole body, it just stays in the intestines and works there, but it works on the large intestine too and it does decrease beneficial bacteria in a typical way that antibiotics would.

Shivan: And then your Flagyl.

Dr. Siebecker: Like neomycin it is meant to be used along with rifaximin in cases of constipation or methane. And both of those them work quite well. Metronidazole though is completely typical antibiotic; it absorbs systemically and there's nothing particularly special about it. It's just a regular old antibiotic.

Dr. Siebecker: What's different about rifaximin is that it is not like a typical antibiotic at all, it doesn't even behave with the same properties that we're used to as a typical pharmaceutical antibiotic. And this is why it's important for people to give antibiotics maybe a second thought, at least in the case of rifaximin in terms of SIBO.

Some of its special properties are that it is not absorbed into the blood system of the body, it stays in the intestines and has its effect just there. In fact, predominantly its effect is just in the small intestine right where we want it. If it's not absorbing into the body, it has less of a chance to wreak havoc it in other places and lead to the side effects that we think of like urinary tract infections or things that can happen when a person takes an antibiotic. Yeast overgrowth is another thing a lot of people are familiar with, either it makes their current yeast overgrowth worse or it might give a yeast

infection. Rifaximin has been shown studied and shown not to do that so it does not cause yeast overgrowth. Very important to know.

Also, what pharmaceutical antibiotics are famous for is killing everything and destroying our microbiome, particularly in our large intestine where all the good bacteria are and rifaximin doesn't do that. It has been shown not to do that and in fact increases lactobacilli and bifidus in the large intestine. And because of this extremely unique property of rifaximin it now is called an antibiotic with eubiotic effects. It has positive effects. Additionally, its anti-inflammatory.

The list starts to be like this is just getting too good to be true, but this is all studied and shown to be true. It's anti-inflammatory through the NF-kappaB pathway of inflammation through the PXR gene. This is a very important pathway of inflammation that Dr. Kharrazian, one of my favorite teachers, has taught all of us who've studied from him he teaches us about this, and we can learn it in other places too.

But it's a self-perpetuating pathway of inflammation that affects the intestines, the liver and many systems in our body. Self-perpetuating means that its end products turn it back on. And so, we need certain things to sort of stop that perpetual cycle. Rifaximin does that. It's quite extraordinary. It's also been shown to be non-toxic and safe. Its side effects are equal to or less than placebo. Now, you might be thinking is she paid by this company? No. I have never even talked to them I have just read the studies and I've used it in my patients. **Anybody could react to anything that we give them, and I certainly have people that have reacted to it, but very few respectively amongst all of the people that I've given it to and it's the same with my colleagues.** Of course, people can, and you can have an allergic reaction to anything.

Dr. Siebecker: And one last thing that's special about it is that it has been shown so far in studies not to have antibiotic resistance developing to it. I have seen clinical resistance. I've had some people use it and then they try it again and it doesn't work as well. I've also seen that not happen, but I've seen it both ways. So even though the studies are showing no resistance I have seen some.

Shivan: So, it's not unusual if you have a high level of hydrogen gas, for example, that's revealed in your breath test, which we'll explain, it's going to take more than one round of rifaximin to bring those levels down.

Dr. Siebecker: Of any treatment you're giving really. Almost.

Shivan: Okay.

Dr. Siebecker: That's right. And so, it's important to know that if you are going to be using rifaximin, it is safe to repeat and at least the studies have shown it will work as effectively as the first time, the studies have gone out as far as six repeats.

Dr. Mona Morstein: Now I like rifaximin, you know we've got Xifaxan the brand, the problem with Xifaxan is that it's expensive and even if people have very

good, every now and then I have a patient with such good insurance they don't have to pay anything.

You know and of course I always make them, I always tell them to print out the copay card from Salix, but you know sometimes that will bring it down to \$400.00 instead of \$800.00 and it's expensive. And if people can't get that drug at that cost, I feel very comfortable ordering it from Canada.

Shivan: Okay.

Dr. Morstein: There's rifaximin.

Dr. Morstein: Now why do we like, of course it's \$155.00 for 100 pills

Dr. Pimentel: Well, that's tricky although I think—so what we're seeing in study again that we published, we're seeing a 30%+ reduction in the number of patients being sent to offices like me who have diarrhea-IBS. Don't get it in your mind that I'm seeing less patients because I'll tell you what's happening.

So, diarrhea IBS Is going down in terms of coming to the tertiary care medical center. That, in and of itself, means we're saving money in IBS for the first time. And patients are getting treated at lower levels of care appropriately, and potentially, their disease is going away temporarily. So that's great.

On the constipation side on the other hand, we're seeing a 30% to 40% increase. And that's why my clinics are not changing, and there are still a lot of patients there.

But hopefully, all of that means that insurance companies get it. If you're treating at lower levels of care, and you don't need to come all the way to see me in our offices and Dr. Che in Michigan and Dr. Rao in Georgia, that you're saving money because you're not getting all those testing's and all that expensive stuff that we do at tertiary care medical centers. And the insurance companies will say, "Okay. Well, this makes sense because it's saving money in the long run."

Dr. Morstein: I always combine it with guar gum. There's a very good study that said that guar gum made it up to 70% better so I always, for every dose of Xifaxan or rifaximin always do a partially hydrolyzed guar gum with it and I also add in a product for the gallbladder that has a little bile salts in it because rifaximin works well in the small intestine because there's bile there and there isn't bile in the large intestine, there's water which doesn't activate it as well. So, I mix in a little bile with the guar gum.

Guar gum is a fiber powder. I use Nestle's Nutrisource. I just buy it online, have it in my clinic and sell it at the same cost to patients. It comes in a jug. It's easy,

Dr. Jason Hawrelak: Yes. And partially hydrolyzed guar gum, interesting substance in that if you look at the broader irritable bowel syndrome literature—and I did a systematic review looking at all the research, looking at, we'll call it PHGG because it's far easier to say, in irritable bowel syndrome patients. And there are eight

clinical studies, all of which showed a benefit to IBS patients in terms of reduced symptoms.

So, it didn't surprise me necessarily that it worked as an adjunct to antibiotics. And it's got a pretty unique capacity to actually decrease methane output. And I would say that's what makes it somewhat unique as a substance.

You will know, and many of your listeners will know, that you can generally divide SIBO into hydrogen-dominant or methane-dominant. And those that are methane-dominant, it's wonderful that we've got another tool that specifically addresses that.

It comes from the guar bean. They would isolate out the gum. And that's when you use it, I suppose, as a thickener aid and as a dietary fiber for hundreds of years. But the hydrolyzation process, they chop it into smaller bits. And that process is important because it actually ferments differently. So, you can't assume that normal guar gum will work the same.

Dr. Hawrelak: In fact, we have research showing that normal guar gum increase methane gas output, whereas partially hydrolyzed guar gum decreases methane output. So, it's important to keep track of that.

And also, the microbes that are capable of eating PHGG are actually different too, and that we tend to have an increase in numbers of butyrate-producing bacteria, as well as bifido bacteria when people consume partially hydrolyzed guar gum.

Dr. Mona Morstein: Look, there was a study that combined rifaximin-treated patients with SIBO, and they gave them just rifaximin, then they gave them rifaximin with guar gum. The just rifaximin people, 65% had SIBO eradicated. The partially hydrolyzed guar gum and the rifaximin, 85% eradicated.

I'm sold, absolutely. With every dose of rifaximin, my patients are getting some guar gum. Is it SIBO-legal? No. I don't care. In the killing phase, I don't really care at that point.

And the other thing I love about guar gum aside from this set up of guar gum and the biofilm and the gallbladder, all of these working to make the antibiotics so much more effective, is because it's actually a little fiber, I have very few patients, even if they're on Xifaxan and a second antibiotic, such as neomycin or Flagyl, get the stomach upset that can be seen in these antibiotics.

I haven't had patients, "Oh, my stomach is so upset," or so forth. If that happens in a rare patient, I just add slippery elm gruel which works great and is completely not SIBO-legal.

But I don't care because ingesting things that are not SIBO-legal during the antibiotic phase is meaningless to me. It will not inhibit the actions of the antibiotic. And as we know with guar gum, there is a significant increase in eradication using it. That's the key right in that two weeks. Kill SIBO. So SIBO-legal goes out the door for me during that time.

Shivan: So, guar gum is a fiber. Partially hydrolyzed is the kind?

Dr. Morstein: Don't get straight guar gum. If you get straight guar gum like at the health food store, it's just cement. It just turns into cement. So, it has to be a partially hydrolyzed product. I use Nestle Nutrisource.

Shivan: Good to know. And how much am I taking with the Xifaxan?

Dr. Morstein: So, you're going to take half a tablespoon and eight ounces of water with every dose of Xifaxin with one capsule of the bile, one capsule of the biofilm buster, and some probiotic that is SIBO-legal. We actually had in a study that giving probiotics actually help eradicate SIBO.

And if I am also doing neomycin or Flagyl, these can have an effect in the colon, whereas Xifaxin doesn't, and might affect the microbiome. So, I feel compelled to protect the microbiome with this probiotic that, for me, 99.5% of patients have never had a problem with.

You have 20 ft. of small intestine full of digestive enzymes, full of bile. It has a much quicker movement to it. And again, it's a bile atmosphere, which is why Xifaxan is active. And Xifaxan or Rifaximin needs bile for it to be activated which is why it's not active in the colon because that's a watery environment.

Whenever I'm dosing Xifaxan, rifaximin, I always give patients a supplement that has a little ox bile and some herbs that produce bile from the liver, obviously, to secrete through the gallbladder because Xifaxan, as we know, it works in the small gut because of the bile.

Well, how do I know how much bile everybody is making? Maybe I do, maybe I don't. What if they don't have a gallbladder?

And so, I just decided I need to maximize that bile in the small intestine. And so, I use a product.

Now, there are herbs. Of course, ox bile is not vegetarian. It's ox bile. It is from an animal product. But herbs that in and of themselves stimulate bile—milk thistle, dandelion, turmeric, chelidonium, artichoke, these herbs can be given in a formula to try to stimulate production of the bile each time Xifaxan is taken.

Dr. Ilana Gurevich: The way I describe biofilms to patients are it's the difference of the bacteria living in a brick building versus them living in a twig house. A twig house we can blow down and our medicines are going to get there. If they're in a brick building, me throwing some eggs at your brick building is not going to make anybody move out of the building. That's where the biofilm busters come in. It's like bombing the building so that we have access to the bugs. Biofilms are just starting to come into our frame of thought for treatment right now and there's an amazing naturopath, Dr. Paul Anderson, who came up with this – I mean that man, if you want
to talk genius that guy's a genius. He knows his physiology and biochemistry. We're starting to use this bismuth-based microbiome breaker.

Dr. Ali Rezaie: In terms of biofilm, there is definitely a great point there. So, in your small bowel, for example, there are villi. These are the tiny fingers coming out covered by a single cell epithelium that are sitting there and they absorb food.

On top of that, there's like a mucous layer. It's like phlegm on top of it... which is called biofilm. It's a very thin layer. But the way that biofilm interacts with our microbiome is different from the rest of the body. And they are liquid inside the small bowel.

So, if we figure out how to penetrate the biofilm to help the other interventions that we implement to target them, that will be very helpful. And it's actually what we are working very hard to get to that point. In fact, we have made some breakthroughs on that one as well. And that is one of the main reasons that we could target and study small bowel microbiome, because we figured out a way to separate biofilm from the bacteria.

The bacteria go and hide inside that thick film and stay away from the antibiotics, stay away from being assessed and being picked up and cultured. And that's very important to penetrate that.

So yes, the concept of biofilms is real. We need to work on how to penetrate it to make our current treatment more effective.

Dr. Rezaie: The problem with biofilm busters at this point, think about it, we have 20 ft. of small bowel, and 20 ft. of small bowel has a lot of biofilm. So, the absorptive surface of the small bowel is as big as a football field. So, busting the biofilm as big as a football field, it's not that easy. So, you need specific targets that we're working on.

But obviously, some of the targets that we're working on is already available and is being used. Whether they are helpful or not, we need more data on that. But definitely, it's a very interesting and amazing field to work on because I have no doubt that, eventually, it will help patients control their symptoms.

Shivan: Is there anything else in terms of the medicine cabinet that we need to be looking at as SIBO patients?

Dr. Ilana Gurevich: You know, I find that herbs work. I used a lot of Xifaxan for a long time. With my methane patients I use the Xifaxan and the neomycin. I actually think Xifaxan is a good medication. Even as a naturopath I think it's a good medication. It's not even an antibiotic. It's considered a eubiotic. It upregulates your bifida and lactobacillus. It downregulates all those pathogenic species. I don't worry so much about rifaximin outside of cost because some insurances cover it, and some do not. It could be five dollars or \$1100, you never know. We're talking a lot about SIBO, which is bacterial overgrowth. I don't think you can discount SIFO, which is fungal overgrowth. I don't think you can discount parasitic infections.

Shivan: Right.

Dr. Gurevich: Herbs are significantly broader spectrum.

Shivan: And can help those.

Dr. Gurevich: And can help those. So, you're getting different side effects. The side effects of the herbs are you're killing more broad range things and you're also upregulating good flora.

Shivan: When it comes to the herbs that you like what are those?

I always start with allicin, which is physician grade garlic, Dr. Gurevich: berberine and neem.

Shivan:

So, as we move along, we get to talk about antimicrobials that are herbals, which is very near and dear to my heart as like a natural healing girl and all that.

Dr. Allison Siebecker: Yeah. And mine as a naturopath.

Shivan: Right. It's great to know that there are options. I did those for a really long time, and it helped I think reduce the bacterial load, but it didn't get me to where I wanted to be. But that doesn't mean that it wouldn't get you there or that it didn't help, it did help for sure. And those are cool because they're so readily available and definitely not free but less expensive ultimately, depending on whether or not your insurance company just paid for your rifaximin.

Dr. Siebecker: That's right. And by the way, the other pharmaceutical antibiotics are always covered by people's insurance. They're standard. But veah, so the four main herbs that we use typically to treat SIBO are berberine-containing herbs. which are things like goldenseal root, Oregon grape, barberry coptis. You can often find formulas that just say berberine on them and they have various combinations of these herbs. So berberine-containing herbs. Neem is a traditional avurvedic and a microbial. We use oregano, like the kitchen herb spice, oregano oil. And then lastly is an extract that comes from garlic called allicin, like my name but it's spelled different. And in that one we like to use stabilized allicin extract because garlic is a very fermentable food and triggers a lot of people's SIBO symptoms. We don't want to use whole garlic per se like the actual clove taking it down, unless somebody did tolerate that, but it's pretty common for SIBO people not to. And we don't want to use like garlic crushed or garlic oil. We prefer the antibacterial extract allicin that's been extracted out. That's what we tend to use. So those are the four main ones we use. Another one that's quite good is cinnamon. Typically, we'll go to that as a backup.

Dr. Siebecker: Now, these are single herbs and a lot of us will approach SIBO treatment using anywhere from two to three of those together sort of a single product, you just take them together. But another approach is to use a formula that's meant to be like an herbal antimicrobial formula with a whole bunch of herbs in there. Sometimes they come with maybe six herbs or something and sometimes it's like 20 herbs. And they're aimed at not just bacteria but parasites and fungus. They're just these large antimicrobial combination formulas and those work too.

So, the reason that you would choose the singles, you know, using two or three of those versus the big combination formulas, for me it's really just about the type of patient. If you have a more sensitive patient, I tend to see a lot of really sensitive patients. They come to me telling me I know I'm really sensitive; I'm reacting. And what I mean by sensitive is they react to food, pills, supplements, medicines, kind of like everything that goes in orally they easily react to, especially herbs and things like that. If they are like that and if they don't know then you don't know, but if you know then I like to use less items. I'll start with a smaller amount. I might just do two herbs together. I typically just do two. I might to do berberine and AliMed or berberine and neem, something like that.

Shivan: Okay.

Dr. Siebecker: You can make them up any which way. But then the idea is if they start to react to something in a way that isn't die off if you can tell then it's easy to figure out which one it is. Pull one away and see how that is, if that wasn't it pull the other one away and then it's easier to figure out what their reaction is. But if they're not sensitive then lots of doctors just use these big combination formulas. My only concern with that is die off. Sometimes you can get a little bit worse die off because you're killing yeast at the same time. You might be affecting parasites as well. And yeast die off is worse, usually, than bacterial die off, but if it's going well it's going well. You never know until you try. Both ways are very effective. There's only one other thing to think about here. One of the reasons why I often tend to go with a few herbs, two or three is most of the people I see have high gas levels. And you mentioned that before when somebody has really high gas levels it can take multiple rounds of treatment to get those gas levels down. It's just that the herbal antibiotics and the pharmaceutical antibiotics they can only do so much in one course.

And they usually can lower gas somewhere in the 25 to 30, 35 in that range so we'll say 25 to 30 ppm per round so that's two weeks for antibiotics, four for herbals. And you can continue those durations a little longer. I have found three weeks is about the maximum benefit I get out of antibiotics. I've seen some folks who have come from doctors that have done it longer that it has worked, but most of the time it doesn't. You kind of get what you're going to get after about three weeks.

And the same thing with herbs, six weeks, you can go to two months. Usually after around that time we've hit our max and what happens for a lot of the people I see is they actually begin relapsing while on the herbs after about two months. I usually want to stop somewhere in that six weeks to two-month range.

So anyway, if we need multiple rounds I'm concerned about antibiotic resistance or clinical resistance to what I'm giving, and I see it all the time. I want to reserve some things back to give...

Shivan:

This is for herbals?

Dr. Siebecker: Yeah. Exactly. For herbals. So that's why I might not give a formula that has absolutely everything in it right away. But it's hard, if somebody doesn't have really high gas go right ahead with one of those, or if it's just what you want to do.

Shivan: So, let's talk about the use in more of a medicinal way for just a second of essential oils because, if you have gut issues, a lot of us are familiar with peppermint for tummy issues as well as oil of oregano as an antibacterial. I also wanted to find out what you felt was a really good antifungal because Candida is real.

So, what are your thoughts on those particular things? Let's start with the oil of oregano. Is topical okay, consume it? What are your thoughts on it?

Dr. Eric Zielinski: Yeah, both. And research has actually shown that oil of oregano can help repair leaky gut, actually help those tight junctions tighten up...

Shivan: I love that!

Dr. Zielinski: And that was pig study. We don't deal with—unfortunately, in America, people aren't investing a lot of money in human trials that we see overseas, especially in the Middle East and Asia. They're doing a lot of research on human trials. And we're starting with animal studies.

So, oil of oregano, for sure. But when it comes to the application, it's via ingestion.

But you just don't want to put a drop in your mouth. You don't want to put a drop-in water because oil and water don't mix, especially for oregano. Anything that you're taking medicinally, treat it like you would a pill, a drug. Create a capsule. You can get a little gel capsule, size 00 (double zero) on Amazon. You can go get vegan. I always recommend a vegan capsule (you just don't know what's in the other stuff). And you put just two, three, maybe four drops of oil in it. And then, you fill the rest with an edible carrier oil, like olive oil or coconut oil. And you consume that.

I would start at twice a day, and then monitor your progress for two weeks and see where you're at.

And there's a number of different solutions when it comes to Candida, when it comes to SIBO. I mean, there are different solutions for each ailment that you're trying for.

Dr. Jason Hawrelak: I almost always do use probiotics from the first bit of diagnosis. So, when I do the breath testing, I take their history and I work out, "Okay, yes, it's SIBO. That's the main cause of your symptoms," I will be using probiotics at that time and point.

I suppose I was lucky enough that I did my PhD looking at the role of dysbiosis in irritable bowel syndrome. And I started this project back in 2000. So, it was before the SIBO literature sort of became more well-known. And I had the chance to see that grow from a small bubble to what it is now.

But because I had that comfort level with using probiotics for irritable bowel syndrome, and people were talking about SIBO being the main cause of IBS, I never had any hesitation about the use of probiotics in IBS because I was doing clinical trials on these patients, treating patients in clinic with IBS with generally good results already at that point. So, I didn't have that same hesitation that I think you could get at a certain time or point where probiotics were like, "Ooh, they're a no-go for SIBO patients." So, I think that was certainly part of my background that led me to where I'm at. And also, having a chance to evaluate the literature, I think if you look objectively at the probiotics in SIBO literature, the evidence is overwhelmingly positive in terms of trial outcome.

There's a handful of trials that showed those particular strains weren't useful, but the vast majority have been shown to be useful in either helping with eradication, or at the minimum, decreasing symptoms significantly.

Dr. Hawrelak: Okay. It was bacillus clausii. And the product was an **Italian probiotic called Enterogermina.** I have to close my eyes to visualize that one to get that one. And it is available in Europe and has been for a long time. It's just not widely available outside that realm. And the saccharomyces one is easily available in North America as Florastor.

Shivan: I thought that was SB (Saccharomyces Boulardii).

Dr. Hawrelak: Ah, well, yes, good question in that we now know that there is no such thing as Saccharomyces Boulardii. I probably have to take a step back in that there's a microbiologist in Southeast Asia I think in the 1920s called Henry Bollard. And he was in Southeast Asian village where there was some cholera going through, and there's people dying of horrible diarrhea. But he noticed that some of the locals were making a drink from lychee skin tea. And he was a microbiologist. These people were getting better and/or weren't getting sick. So, he was curious and said, "Okay, I wonder what microbes are available in that lychee skin tea." And he found a yeast, which is a type of saccharomyces, which he, as microbiologists often do, named it after himself, Saccharomyces Boulardii. And he sold that to a French company called Biocodex in the 1940s. And it's been sold around the world as a probiotic since that point in time.

But we now know that there's not actually a separate species. It's actually so closely related to baker's yeast and brewer's yeast. That's actually classed within that same species. So, it's saccharomyces cerevisiae which is the baker's yeast species. But it's just a unique cultivar. They're called the variety boulardii. And it's the Biocodex strain. There's a number of different strains of boulardii which, again, are similar genetically, but also a little bit different.

And all it takes is a gene turned off or on that makes the yeast good for fermenting wine versus champagne versus beer versus other things. So yes, I think the gene tweaks are important.

Dr. Hawrelak: That particular yeast is a pretty phenomenal yeast actually when you look at the clinical trials and so on. It tends to decrease Candida counts in

the gut. It's helpful against protozoal infections like Giardia and blastocysts as well. It helps heal the gut when it's damaged because of its capacity to release these compounds called [polyenes] as it traverses to the gut. So, it's got a number of actions and they get immensely useful. And I use it a lot in my clinical practice because of the range of actions it actually has. But yes, it does seem to help in SIBO as well. And I particularly use it in hydrogen dominant SIBO.

Shivan: And it's called Florastor. So, in the States, you can get it at Walgreens or CSV.

Dr. Hawrelak: Sadly, some of the strains that have been used in the research aren't commercially available at this point in time. And I think this is the biggest issue in the realm of SIBO.

And I see this as a probiotic researcher all the time when I'm reading through the literature they come up with, "Ah, that's a new strain being useful for this condition." It's not commercially available, and it may not be for five years.

And sadly, some of this has been happening similar with the SIBO literature that, yes, there's been some strain s researched essentially from the early 2000s in SIBO, but most of which are not commercially available.

In North America or Australia, there are some like Enterogermina which is available in Europe, which is this specific strain of bacillus clausii.

And there is Saccharomyces cerevisiae variety Boulardii, Biocodex, which is available in North America as well as many parts of the world which actually has positive results in one study, and I'd say more equivocal results in a second study (although the second study compared it to antibiotics specifically). There was a substantial decrease in both hydrogen output even after seven days on this particular probiotic strain. But it wasn't as effective as antibiotics. But still, it was more effective than placebo.

Dr. Ali Rezaie: I don't have any problems with fermented food because, obviously, they're natural. And also, when you have a healthy stomach, the stomach allows a certain amount of dose to enter the small bowel. And generally speaking, I do not recommend my patients to avoid fermented foods to be honest.

But in terms of probiotics, there are multiple types out there. They're a bit different compound. There's like millions of combinations essentially out there which makes it, essentially, impossible to study every single one of them.

The same way that I talked about that the signature of our microbiome, even in diseased patients, is not exactly the same, it's kind of scientifically naïve to think, "Okay, I'll give you two or three or five strains of bacteria with probiotics, and all of a sudden, this miraculously fixes you." I wish it was that simple... it's not.

And more and more of you are understanding that probiotics, if we just use them just because we want to use them, that's not necessarily the best way of doing this.

Dr. Rezaie: A good study was done in England with more than 3000 patients. These are patients who received placebo in a double-blind fashion or probiotics for 12 weeks after therapy. And 1500 got placebo, 1500 patients got the probiotics. And this is Bifidobacterium and Lactobacillus.

And they checked to make sure that the probiotics are live because one problem with probiotics is that they so often die. You put living organisms inside a capsule, they die. So, they checked that they're alive.

And they followed them for 12 weeks after antibiotic therapy to see if they see a decrease in the number of antibiotic-associated diarrhea and also antibiotic-associated C. diff infection. They didn't see any of that effect; they were exactly the same.

But what happened was is that people on the probiotic arm got more bloating and flatulence. So, in a way, actually, they got more symptoms than the people that got placebo. And that made us think, "Okay, so probably just throwing empirically probiotics is not necessarily the best thing."

Having said that, yes, your argument can be—well, that compound of probiotics doesn't work, there are other compounds. But I mean, how many 3000-patient trials can you run with each compound? It's a little bit hard to do that.

Dr. Mark Pimentel: So, the challenge with probiotics is that if you smoosh all the studies together, you can say, "Okay, look, there's an effect with probiotics." And that is true. There are meta-analyses of probiotics in IBS, for example. There's even one meta-analysis in SIBO.

The problem is you're smooshing studies of 20 patients, 40 patients... small trials. And in general, small trials that are positive get accepted at journals. Small trials that are negative, people say, "Well, it's a small trial. That's why it didn't show a result."

So, you have to be careful with how you assemble trials. There's a lot of what we call publication bias for positive trials. Journals don't want to publish trials that are negative as much. And so that skews the number of trials that are out there that are negative.

Dr. Pimentel: Either way, my point is when you add more bacteria, you're adding it when you already have too much bacteria. So, are you simply adding more gas-producing organisms or are you making a benefit? And the jury is out! I personally think there is a probiotic out there, there will be a probiotic out there that, when studied carefully and correctly, might be beneficial.

But what we do know is that fecal transplant, and we've even looked at some of these data in systematic reviews, fecal transplant, five trails, and two of the trials show placebo works better than fecal transplant. That tells you that it's not about fecal transplant. It's not that placebo is better than fecal transplant. It's that, potentially, fecal transplant makes people worse.

So, be careful! And I advise my patients no fecal transplants for IBS or SIBO right now because we really don't know.

Dr. Ken Brown: By the time they come to me, by the time you're seeing me as a patient you've tried every probiotic and you're still miserable. So, I have everybody stop. We stop, we treat it, we treat aggressively, we see if we can get you feeling better and then you can restart it if you feel better on it. That's what I tell everybody. The data on probiotics, cumulatively, is not very good over time, but individuals have tremendous responses. So, I take it as a case by case basis. If you do great on it, awesome, stay on it. If you don't ... I'm a little bit more of a fan of like the spore-based probiotics, like Megaspore, because it goes to the colon and it's been shown to go to the colon. So that's a little bit more my thought process, but

Shivan: What about just like sprinkling it on your food if you're just like really doing baby steps. Just a little bit.

Dr. Brown: Yeah, no, I think you totally can. I would prefer eating fermented foods. I would prefer, once again, why, the same word, because the fermentation takes place in the polyphenol fibers and my belief is that the fermented bacteria that's in there has a little vehicle that gets through to the colon where it can then proliferate. Because otherwise, your body will do a pretty good job of killing most of the bacteria that we take in.

Shivan: That is the best explanation about why fermentation is superior that I have ever heard, and I've heard a lot of talk about this, a lot.

Dr. Brown: Yes, I'm a big kimchi fan, I'm a big, you know sauerkraut that kind of thing, because it's food. The food, the fermented food, the bacteria's in there, it's the best way to deliver anything.

Shivan:	And start out little.
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Dr. Brown: Start out little, yeah.

Shivan: Little baby, little baby.

Dr. Brown: Because it can, yeah, knowing that, knowing that they can make it worse in some people, people think, "Oh, it's probiotic, I'll just take anything," and do it.

Dr. Michael Ruscio: You know, one thing that's interesting is that some of the researchers are now positing that because there's so high of a density of bacteria in the large intestine, it may be hard to have much of an impact from probiotics. Think about it this way. Think about if you're trying to move in—let's say you're trying to move into a beachfront property in Maui. It's so densely populated that it's so hard to find somewhere to live—or maybe downtown San Francisco would be a better example. It's super densely populated. And when a place is very densely populated, it's hard to be able to get in.

So, that's kind of like your large intestine. The small intestine is like a very rural area that's not highly settled. So, there's more empty apartments that you can occupy. So that may be like your small intestine.

And so, what some researchers are theorizing is probiotics may have more of a benefit on the small intestine because there's more of a chance for them to influence the community because there's less bacteria there.

Dr. Jason Hawrelak: The receding thing is actually a myth. It goes back a long time. It goes back to the 1900s. They said that we could ingest yogurt bacteria and they would permanently stay in our gut and prevent protein putrefaction and keep us healthy and help us slow down the aging process.

That idea has been around for a long time, but we've got 30 years of clinical trials showing that for the vast majority of probiotics that we actually ingest, they're temporary visitors. They're there for a few days. And in three, five, seven days afterwards, they're generally gone.

So, it's not a matter of receding, and I think the idea that we can easily recede the ecosystem, I think cheapens it.

If you could just regrow your finger really quickly, you wouldn't really care about much. You can just chop it off and regrow it.

I think it's the same thing that if all it took was just taking a bottle of pills from the fridge to restore or just to recede your gut, you wouldn't worry so much with antibiotics. And I think that's part of the problem now—when you realize that the species that are going extinct are ones that we don't have in probiotic capsules or powders.

And that even the ones we do have in capsules and powders made from lactobacilli bifidobacteria are temporary visitors at best, it makes you sort of want to be much more of a custodian of that ecosystem and care for it in a different sort of way. So yes, taking the right probiotic during antibiotics can help minimize the damage it caused, and taking prebiotics after antibiotics can help restore a healthier ecosystem, but some species will still go extinct from that process.

Shivan: What's a prokinetic? Let's talk about that.

Dr. Allison Siebecker: Okay. A prokinetic it means pro movement or motility. And what they're meant to do in our case here with SIBO stimulates the migrating motor complex. A very important point is that they are not meant to stimulate a bowel movement. We're not trying to use them as a laxative. Sometimes a prokinetic could work like a laxative and so diarrhea patients get very concerned about that and doctors treating diarrhea patients get very concerned about that they think I can't use prokinetics, (*but they can!).

Prokinetics are not meant to cause bowel movements or diarrhea. Now, anything we give could have that effect, if it does you stop it and try a different one. Also, at a high enough dose if you went very high it could have that effect.

But we use them at low dose at very low dose actually so in fact you'll see the words low dose are put in front of most of them because all we're trying to do is stimulate the small intestine migrating motor complex. We're just trying to keep, for most people that's what is deficient and the underlying cause for most people with SIBO.

And now we've cleared the bacteria or partially cleared it, we want to keep it clear. And if we had a well-functioning migrating motor complex it would be kept clear so we're trying to help that situation by giving prokinetics. One other thing prokinetics do is they're also meant to coordinate gastrointestinal motility to make it just move downward in a way it's supposed to. For instance, they can help with acid reflux and burping and nausea symptoms like that because those are more upward symptoms and prokinetics are meant to make the muscles contract downward. Maybe I should mention what the main ones are that we use.

Shivan: Sure.

Dr. Siebecker: Okay. There are three pharmaceutical ones and three natural or supplemental ones. The three pharmaceutical ones are low dose prucalopride. That brand name is called Resotran or Resolor, Resolor is the name brand. There's low-dose erythromycin. And there's low-dose naltrexone called LDN for short. And then on the natural or herbicide there is lberogast, MotilPro and ginger. And Ginger is in MotilPro, but just plain ginger is a good prokinetic. I can talk you through all of them if you want to hear about them, but those are our basics that we use. One issue with prokinetics pharmaceutically is that many of them are too broad in their receptors that they activate in their actions and they have safety issues and many of them have been taken off the market. For the ones, I mentioned to you are safe, and in fact that's why we use them. It's an important point because many doctors think there are no safe pharmaceutical prokinetics, they are unaware of these choices.

So that's a very important thing to know that there are safe prokinetics. But this is another question a lot of people have is how long are we supposed to stay on this prokinetic? And that depends on the case and the situation. The basic recommendation from Dr. Pimentel is just give it a minimum of three months and then you can do a trial removal and see how it goes. And that's certainly going to be great for those one-third acute cases. And of course, how do we know which is which? But for the chronic folks we might already know they have all these underlying predisposing conditions. Many people are going to need to stay on it ongoing.

Dr. Mark Pimentel: So, if a patient responds to treatment for SIBO, and it's gone for a year, I don't need to do anything. You can go on a diet. We usually recommend the low fermentation diet that we've adopted.

Again, the low fermentation diet is more than just what food it is, but how to eat timingwise.

But if they don't relapse for a year, I don't want people on anything else. Just go about your business and live your life!

Obviously, we counsel them to stay away from any risky behaviors, food poisoning. I don't say, "Don't eat off food trucks." But in California, if there's a C on the food truck, maybe don't choose that one. And be careful with travel so that you don't get food poisoning.

But if your SIBO relapses, which unfortunately is probably about 70% of SIBO (so it's the bulk), then we have to do something. And generally, we start with erythromycin because it's cheap.

Now erythromycin by name is an antibiotic; but by dose, it can either be an antibiotic or a prokinetic. So, at high doses, 2000 mg a day, it's an antibiotic. But at very low dose, 15 mg, it's a prokinetic.

And so, generally, we use it at nighttime to trigger cleaning waves. And it's been wellknown—we do this with the manometry test, six hours of manometry. **During the test**, we get a shot in the arm in the IV of 15 mg of erythromycin. Five minutes later, cleaning wave. So, erythromycin instantly triggers cleaning waves.

And its bioavailability is exactly the same by mouth as it is by IV. So, you don't need to take an IV to get that boost. And it works quite well.

Now, it doesn't last long. So, we do have other prokinetics that are more powerful. And we're excited that a drug, prucalopride, was recently approved by the FDA (in the US) which also has a potent effect on cleaning waves and other motility events of the gut.

It will last for a few hours. But ideally, if it could last for eight to ten throughout the entire night, you get a whole bunch of cleaning waves, that will be great.

I will say that, when you get a lot of cleaning waves, and you haven't had them for a while, you could feel them. And I don't mean cramping. I just mean the gurgling.

This is what I tell my patients. If you hear gurgling for 10 minutes, and you're embarrassed, be very happy. That's the cleaning wave coming through.

So, people, when they haven't eaten breakfast, they come down for a meeting, and their stomach is making that sound, and they're embarrassed, that is what you want. You want those. Those are your cleaning waves. And count blessings. Don't be embarrassed.

Episode 7: Is It All In Your Head?: The Truth About Your Brain & Gut

Dr. Sheila Dean: There's more research now than ever that shows that there's this profound gut-brain connection. And you even see it in little kids. I mean think about the little kid who starts complaining that they have a bellyache the day of their test, right, or kids who feel like they're not feeling well when they know they have an exam. So there's a real gut-brain connection...

And vice versa... the arrow goes two ways. When a person's brain chemistries are not completely balanced, it can affect the way one digests, and a variety of other GI issues come up as well.

For example, IBS (irritable bowel syndrome) it's been termed this diagnosis of exclusion, which basically means we don't really know what is wrong with you. And so, you come into the doctor, and you're saying, "Doc, I don't know what's wrong. I have this issue and that issue." And a lot of the times, when you think about it, standard therapy is to give a person like that something that actually alters their brain chemistries, like some sort of antidepressant or anti-anxiety medicine, and a lot of times, people actually experience some relief initially because they get some of their symptoms under control for a little while. But of course, we know that once you do that kind of damage control, then we need to go to the root of the problem and really ask the important questions which are: "Why is this happening? Why is this happening?"

Dr. Ritamarie Loscalzo: So that's where, I look at the digestive tract, well actually digestion is starting up here. It doesn't start down here in your stomach or in your mouth. Like people say it starts in your mouth. It actually starts up here. And I really work on the stress levels that get people into trouble. Because what happens when people get into under stress is they're producing too much cortisol. Cortisol by design shuts down all the valves in the digestive tract. It turns the enzymes down.

It just diverts attention away from the digestion and out to the extremities so we can run and jump high, right? So that's a starting place.

Yes, you've got to get rid of the process, but you have to change the terrain and you've got to get the stress levels down. So that's all part of the program that I work with.

Razi Berry: Well, many of us have had this feeling of butterflies in the stomach. It can be a positive or a negative. Maybe you remember your first crush in high school. I remember mine. I remember him walking into algebra class and just feeling that sense of butterflies in your stomach. And really, that's the adrenaline. It kind

of makes the gut wall rigid because it's slowing down digestion.

Remember, in times of stress, positive or negative, your body, kind of in that fight-or-flight, shunts blood flow away from your center into your extremities so you can take action and do what you need to do to make sure that you're safe.

And so that fluttering feeling, because it soothes the internal anal sphincter muscle, and it kind of has this effect that goes up all the way towards your diaphragm, that's what causes that fluttering sensation of butterflies in the stomach.

Razi Berry: But I found in some of the research that I read and published that there's what some research calls the connectome which is really this system of neuronal connections throughout our whole body.

And if we understand that we have a hundred million neurons in our central nervous system, our brain or our spinal cord, but then we have another hundred million neurons just in our gut—which is of course called the enteric nervous system—often, our stomach is called the "second brain" for a good reason. And you probably have some people shedding some light on that.

But it really speaks to the wisdom of the body that the enteric nervous system operates largely on its own. We kind of, in a reductionist way, have thought the brain is the master of everything. And we know that that's not really true. And since the 1800s, naturopathic doctors have been looking at the gut as the seat of immunity but also of emotional health.

When we talk about emotions, Shivan, we know that 90% of serotonin, for instance, is produced in our gut. And there is a lot that is involved in there. We largely thought that serotonin and these molecules of emotion—as Candace Pert so beautifully called them and labeled them—were produced in our brains. We have found that it is through the excretion of bile in our digestive tract (in communion with the mucosal lining of the luminal tract of the digestive tract) is where these molecules of emotion are synthesized.

And so, it's really important to think about ways that our eating and our digestion affect our emotions and vice versa.

We'll go into that a little bit more. But I just want to say that one of the really simple but profound ways that we need to speak of our digestion...Through our eating—largely eating, but also breathing of course, taking things into the bloodstream through our breath—we take in the environment, the foods that grow and have their own vital force, their own life force, into our bodies. And through digestion and assimilation—and if our absorption is healthy (which to many of us, it's not)—that is where we build every cell, every neuron, and thus every emotion that we feel. Again, it really co-creates with the environment who we are.

And so, digestion and digestive health is not only so important immunologically, but also to the existence of who we are to make sure that we have healthy relationships and are able to adapt to those relationships and challenges and things in the world around us. And so, the research is showing that our digestion doesn't just affect our emotions, but vice versa. **Dr. Ken Brown:** If a viewer is a SIBO patient, a true SIBO patient. I see this all the time. They not only have gut issues but they kind of feel like they're going crazy also. They kind of feel like they're in a brain fog, they feel that they have fatigue, they feel that they have all these other issues. We now know why though. We know that when the intestine becomes irritated it creates some permeability or leaky gut. MDs shouldn't be using the word leaky gut, but I do. It creates some permeability and it irritates a mast cell. That mast cell hits the enteric nerve and it goes right to the central nervous system.

Dr. Brown: So we have actually shown that when you have SIBO, you can have brain inflammation, hyperactivity, so it's not just in your head there. If we can calm down the mast cells then this anxiety, this obsession, this feeling of, "Oh my gosh I'm in a brain fog, I'm not me." That's what I hear all the time, "I'm not me, something's really wrong."

Dr. Nirala Jacobi: The vagus nerve is just one aspect of the whole gut-brain connection. And the vagus nerve is a cranial nerve. It actually comes out of your brain stem, and it wanders all over your body. And it enervates really crucial areas, especially lots of parts of the digestive tract. And it actually sends information back as to what it finds.

And so, we know that, for example, we're thinking now with Parkinson's disease, that Parkinson's disease actually starts in the gut. So, a lot of people that have Parkinson's, their first symptom is constipation. And there's a lot of complicated reasons for that have to do with damage to the enteric nervous system (which is the nervous system in your gut). But the point is that the message gets sent back up, and it has to do with microbiota and different parts of your microbiome.

So, we know that there is a huge connection. It's kind of like a highway between the gut and the brain, your vagus nerve.

Kiran Krishnan: A thousand cells of bacteria for every milliliter that we have of volume of blood in our system. And we've got about 5500 milliliters of blood circulating through our system. So, it's a 5500 x 1000, that's how many bacteria we have swimming around in our blood. And you would never think that.

So, the intimacy of that relationship between the microbial world and our own system is far more interconnected than we ever thought. And when it comes to the gut and brain connection, there is this information superhighway between the gut and the brain. And that's something called the vagus nerve.

Now the vagus nerve, and then the endocrine system (which is the hormonal system), and there's an immune system that connects the gut to the brain—so there are three roads to the brain—all three of those are bidirectional traffic, meaning the brain can talk to the gut, and the gut can talk to the brain.

And that's independent of what we want. So, your bacteria can produce things in your gut, messages or tendencies, and send it to your brain and make you do

things, make you feel things, make you experience things that you didn't realize we're being controlled by these little microbes in your gut. I mean it sounds alien and crazy.

Dr. William Salt: The vagus nerves are critically important to the bidirectional communication between the gut and brain, particularly from the gut brain to the central brain.

Your little brain in the gut or your enteric nervous system is one of three branches of the autonomic nervous system or ANS. The autonomic nervous system or ANS manages basic bodily functions without your conscious awareness such as breathing and gut function.

There are three branches to the autonomic nervous system—the enteric nervous system branch or the ANS lines the gut. And again, it's the little brain in the gut. The sympathetic branch (which is colored magenta here) located in the spinal cord is responsible for the fight-flight-or-freeze response. The parasympathetic branch is colored blue. It's located in the brain stem and it's responsible for rest, digestion, relaxation and healing. And the vagus nerves are part of the parasympathetic system.

The sympathetic branch is the quick response, mobilizing system. The parasympathetic is the more slowly activated dampening system. And they largely have opposite and balancing effects.

The enteric nervous system or ENS, the little brain in the gut includes both sympathetic and parasympathetic function.

Note that breathing is the only function of the autonomic nervous system that can be consciously access to activate the parasympathetic system which explains why ancient wisdom emphasizes the importance of breath control in stress management including meditation and yoga.

Shivan Sarna: How do you think that the vagus nerve plays a role in SIBO?

Dr. Jason Wysocki: That's the master nerve for what we're speaking of. In this microcosm of the body, this small view, that's the directing nerve. It releases acetylcholine, it puts us in rest and digest very simply. That's the nerve that allows us to get to the place where we actually will digest—where the intestines will function to digest.

Dr. Ritamarie Loscalzo: And we talk about sympathetic dominance and

parasympathetic dominance. And I want to get people into a parasympathetic dominant state with the vagus nerve which comes from the brainstem and it feeds the digestive organs and the heart and the lungs. That nerve needs to be innervated property. And if it does, then we improve the motility of the digestive tract. We improve the communication from the digestive tract up to the brain which then controls the

valves and all the other things that go on in there. We really need to work on this as a whole body thing.

We have fight/flight and then we have this parasympathetic – like you teach yoga, right? What do people get into? Your yoga innervates a parasympathetic state which innervates the vagus nerve. When people come out of a yoga class, they're much more parasympathetic dominance which means that their digestive tract is going to work better. Yoga is one of my methods. HeartMath. If you've heard of HeartMath where you take these little mini vacations like breathing and appreciation breaks. Meditation.

Anything that calms things down and then from a physical standpoint there are things, there are activities that you can do that actually make the vagus nerve work better. But you also can physically stimulate it. You can gargle. You swallow some water and you gargle and that causes innervation. But it has to be like a really vigorous gargle. Like you're crying practically with the gargle, right. Singing can innervate it. Gagging can innervate it. And the other thing that people don't like, they don't like that one. They also don't like coffee enemas. But coffee enemas are a big deal for innervating that vagus nerve.

These fun things just stimulate the vagus nerve but then the relaxation things to stimulate the vagus nerve. And that just kind of creates this difference from the head down. Chewing before you're eating, turning off the TV while eating, not listening to the latest and greatest horrific news. That's what people do during their eating. They're reading the newspaper or they're watching TV. Turning that stuff off, making mealtime a sacred time. Turning on some nice soft music, lighting candles. I mean this is taking it to an extreme, but all of these things can be helpful for somebody who's dealing with SIBO. And I think a lot of people are not talking about those sorts of things.

Shivan: So, what can we do to tone our vagus nerve?

Dr. Robyn Kutka: Yeah, great question. One of the easiest things people can do is breathe. It sounds so silly. And not this breathing up in the chest...

Shivan: Yeah, I know! Hold on...

Dr. Kutka: That's right, you reach for your belly. Perfect, perfect. Yeah, deep breathing. Any time your breath-out is longer than your breath-in, it puts you in that state automatically. It's an exercise to tonify the vagus nerve. Everybody can do that. Four counts in, seven or eight count out, we can do that at work, in the car. It's free.

A lot of people think, "Oh, I'll use that as my stress management." That's great. You can use it when you're stressed. What about using it when you're not stressed to teach your body to live a little bit more. And that's just a simple thing.

But cortisol is one of those hormones that's mapped out on the saliva test. So, you can see the extent of the dysfunction, and then work with somebody that's well-versed in that to come up with a treatment plan that maybe does include some herbs or some

vitamins, some glandular, maybe even hydrocortisone, and then removing stressors. One of the things I ask my patients to do is actually write a list of what's stressing you. That does a couple of things. It takes you from feeling like you're being pulled by your stressors and kind of turns the table, so you can feel a little bit more empowered and recognize them. But it allows you to address them. Remove the ones that aren't serving you that you can.

We can't change our boss—if that's your stress. Could you reframe how you think about it? I don't know.

Shivan: Yeah.

Dr. John Dempster: Another big area that I don't think it's enough credence when it comes to gut issues and chronic illness in general is the impact of chronic stress. And what I mean by this is more than distress. We can have what's called you eustress which is beneficial stress. This is the stuff that can actually build us up and make us stronger. But distress is the negative stress. And we're all going to have it at various points of our life. Most of us are going to have it at various points of our day, but it's how we buffer it and how we manage that stress is so important.

This chronic stress can actually really start to create all sorts of gastritis and ulcers. It can really start to alter the production of digestive enzymes. And it can also be a drain on a lot of those gut-healing nutrients because it now has to manage all of these stress-buffering systems in your body.

And one of my favorite ways to really get this going right away, if you are in a high stressed job, or you're in a toxic relationship perhaps, or you're worried about financials, some of the very common stressors available today. Ten deep breaths every hour is a very easy tool that you can start to implement right away.

And this is something that I preach to a lot of my patients because it's very easy, it's a quick win. You can take it with you anywhere. And it doesn't cost you a cent. And if you just get in the habit of doing 10 consecutive breaths on a regular basis—try doing it hourly—that's going to reduce the impact of stress by approximately 40%. And that's huge, huge numbers. So, that's a very easy take-home for you right now.

Dr. Partha Nandi: I really believe—and this has now been proven—that spirituality is so key.

We all know that if someone hits you every single day and is pounding on you physically, that stress builds up. But what people don't understand is the barrage of emotional stress that they have is just as damaging.

So, what I mean by that is when that guy or gal drives past you in New York or Boston or Philadelphia, wherever you are, and gives you that finger and upsets you, or your boss yells at you and you say, "Well, it wasn't my fault," or your spouse or your boyfriend or your girlfriend or your family member or your friend, that emotional stress gives you that same response I just talked about, that inflammatory response. You're getting the same cortisol, epinephrine, the same mechanism. That same primitive mechanism that helped to keep us alive is now killing us because we're getting it so often.

Dr. Nandi: So, one of the biggest steps is having emotional stability and spirituality. I tell all my patients this. They say, "Doc, you know, I drive a truck. I'm not going to go out in the mountain and sit cross-legged and go ohm." And that's the idea of people, right? And it's okay if you do. But that's the only idea of spirituality they have. Or they think it's religion. It can be religion as well.

But I simply say you have to think outside of yourself and do something that calms the mind—walk on the beach, walk in the garden. Just take a walk and take a breath.

I mean, when I talk to my patients, Shivan, so few of them ever stop to do anything that's purpose-less. "I got to be doing something. I got to be active. I got to be... I gotta get something done."

So, if you can just step out of that and just focus on your breath, meditate, pray, walk, yoga, anything you can, that calms your mind. It decreases the cortisol. It decreases that complete engine of failure. That engine, that's going to continue to perpetuate itself.

So, that means relationships, too. If you can, if there are folks in your life that are not contributing positively to you, then if you can, get out! Get out now. What happens is that that is going to cause disease and ravage your body. And you can't do anything about it.

When you take ownership and have spirituality, we call it cultivation of the mind. You got to be able to take care of the mind.

Dr. Mona Morstein: I really ask my patients to not use the word stress or overwhelmed in their meetings with me because we use the word stress in America today, as an all-encompassing term that hides from us the real emotions that we're actually experiencing. And so I make patients pause and say well work stresses me out, well no, you can't use the word stress, well you know I'm really upset at the new boss... and now we start to really uncover what's working with people and that gives us a way to deal with it mentally/emotionally, but also brings people aware of their emotions and how they may be indeed having a problematic effect on their physical body.

Dr. Michael Traub:

The other thing that people have some control over

in terms

of their self-care is—I'm quoting my guru, Dr. Siebecker, thank you. She talks about telling patients to not hurry and not worry. And so many of us run through our lives multitasking and busy all the time, we don't take the time to slow down and just be. Some degree of stress management that involves a deep state of relaxation I think is really important for all of us, whether that be yoga, whether it be walking whether that be meditation. There are many ways to achieve that kind of destressing and bringing

our level of tension down. And I think that that allows the bowel to work better. We digest our food better.

So, I'm a big proponent of incorporating that into my treatment plan with just about everybody.

And I've practiced meditation for most of my life. I've practiced yoga for most of my life. I've been an active athlete most of my life. So that's one of the things that I really have experienced myself, the benefits of having those be part of my lifestyle. And for a lot of people, they're not. They should be.

Summer Bock: And I'm telling you I've worked with SIBO people who have done two rounds of antibiotics within the past year. I've worked with people who have done two rounds of herbal antimicrobials or three rounds and they're fine when they're done. I have other people who have done seven rounds of antimicrobials where they're like I have to keep doing this because I'm only fine when I'm on it. And they don't know what to do. They're just at this place where they're like I can't stop taking this stuff. And those especially, those are the people that we just go straight for the stress stuff. Like why are you so stressed out? What is going on? And that's where I move more into the coaching part of the work that I do.

But I have two cases where I've worked with one person in 24 hours by doing the stress stuff their symptoms were gone and have stayed gone. I still am in touch with them. They stayed gone because they were literally eating up their gut with their stress. And another person it took them about a week. Same thing. People underestimate the power of the chemicals, of your neurotransmitters and your hormones and the effect that they have on your whole system.

So, there's emotional stress is a big one. I teach people emotional detox. I teach them how to process their emotions, get them out, get them through, don't hold them in. And we know the emotions affect the gut in a major way. I mean just think about what happens when you get really afraid? How many people have to go to the bathroom when they get really afraid?

When I get really afraid like there's a couple of situations where I've had bad experiences. One of them is at altitude where when I start going up too high too fast like if I'm going skiing or whatever like I feel it. I feel like a little bit of anxiety creeps up. I feel my heart kind of increasing in rate and I'm like oh. And then I feel all peristalsis increases. And we get on top of the mountain to go skiing, the first thing I have to do is I

have to go to the bathroom. And that is it. That's your response. Your gut is responding to your emotional state.

And that's happening all the time and if you experience emotions and you hold them in, and you just don't do anything with it that's a biggie. Cleaning up emotions but learning how to do it in a way where you're processing them in a healthy way.

Niki Gratrix: So, "stress" is a widely used word. And we're going to define

more closely what we mean by the word "stress" and dive into that. But what most people don't realize is, when you're stressed, most people just think of that as maybe they're stressed in their mind, and actually you are truly a stressed organism when you have stress. The whole body responds to stress.

And the issue is that most people don't realize, when you look at the stress literature about adult stress, you use that word, most people kind of think about having too much to do, too many emails, the school runs, that is somewhat stressful. But what people don't realize is that most of your stress response is actually set up in childhood.

In stress research, when you have an external stressor, something big like maybe losing a job, or a job stress, the big things that can happen when you're an adult, it's not the event itself, it's the perception and how we respond to it. And the problem is that one person actually deals with that fine, and another person, they'll tell you that "I had this stressful event, and that's when all my gut problems started" or "That's when I got this chronic illness. I had this stressful event."

The point is that you have a bit of stressor at the time. But most likely, it was caused by early life experiences because someone else has had the same stress as you and didn't collapse into a physical illness.

And bear in mind that you're not just stressed in your mind, you are a stressed organism. Your whole body is responding to stress. And we'll talk about that a little bit more.

If early life stress is what is setting us up for our resilience to stress in adulthood, how sort of prevalent is early life stress? Now, this is massive. It's a huge area. And I always talk about the studies involved with this because it's probably one of the most important studies done in medicine and everybody should know about it. And I'm going to talk about the Adverse Childhood Event Studies which were studies of early life stress in children where they were looking over 17,500 adults. It was done by the CDC and Kaiser Permanente, sort of mainstream researchers. It was a massive study of that many people. And they basically looked at the correlation between the amount of early life stress and the onset of chronic complex illness in adulthood. And the results were so impactful. Even the researchers, it changed their careers. It tends to change the people who do this research and actually find out about it.

So, for example, right off the bat, off that 17,500, 67% of all adults said they've had at least one adverse childhood event which is early life stress. If you have a large amount of ACEs, as we call them, adverse childhood events, you have a high level, you have an increased risk of seven out of the top ten causes of death.

If you have six ACEs, you have a 20-year reduction life span. If you have a moderate level of ACEs, you have a six-fold increase of getting some form of fatigue or fatigue-related illness, for example. So, right away, it was dramatic.

Niki Gratrix: And just so people know, when we say an ACE, exactly what do we mean? It's things like parents separating or divorce, physical, sexual or emotional abuse, physical or emotional neglect, domestic violence, mental illness in

the family, substance use or incarceration by a family member. So, one of those accounts for one ACE.

Now, just so people know because it's interesting, if you have the type of business where you always feel overwhelmed because you've got to many emails, the school run, you're managing tons of projects, that kind of stress, the research shows that the equivalent of one ACE.

So, how important are these ACEs? Obviously, we have a dramatic increase risk of seven out of the top ten causes of death. If you have just four ACEs, you have an increased risk of Alzheimer's in adulthood of 400% (4.22 times greater risk of Alzheimer's onset if you have just four ACEs); depression in adulthood, 4.5 times higher; diabetes and obesity are about 1.6 higher; stroke, 2.6 times higher; hepatitis, 2.5 times higher; being suicidal is 12 times higher if you have just four. And especially if you have eight ACEs, you have triple the risk of lung cancer and 3.5 times the risk of heart disease.

It was dramatic. And it affects many more people than we realize. Clearly, this study absolutely confirms that this early life stress directly changes our biology.

Trudy Scott: It's called State & Trait Anxiety and Depression in Patients Affected by Gastrointestinal Diseases. And what they found is that "people with digestive complaints such as IBS, food allergies and sensitivities"—and they actually used the term 'small intestinal bacterial overgrowth," but the word SIBO wasn't really well-known in those days. I didn't learn about it in school— "the small intestinal bacterial overgrowth and ulcerative colitis frequently suffer from anxiety and a lesser extent depression.

And then, this other one which was published in 2001," Irritable Bowel Syndrome, Anxiety and Depression: What are the Links?" So, this is before there were the studies connecting IBS with SIBO. Now we know that a large proportion of people who have IBS, it is actually SIBO. But what they find in this particular study was that 50% to 90% of people with IBS who visited a doctor, all their digestive issues also had panic disorder, general anxiety disorder, social phobia and even post-traumatic stress disorder, and major depression.

So, there's the research there. And now, we've got newer research that I know you and Dr. Siebecker have talked about. But it's pretty interesting that this research has been around a long time.

Dr. Lisa Shaver: So, absolutely, I would say there could be a link between addictions to anything—addictions to food, addictions to watching TV, addictions to social media, gaming online, to sex, to working out...

Shivan: Shopping...

Dr. Shaver:shopping, absolutely, because of malabsorption of amino acids which feed our neurotransmitters. And neurotransmitters are what we

need to fee Ibalanced inside and balanced in the world out there. It helps us interact with us and interact with the outer world.

Shivan: So, I don't usually talk about myself too much in these sessions. I really try not to. But I definitely want to give a testimonial right this second. I didn't realize until I got my neurotransmitters balanced how whack-a-doodle-do they were. They were off!

And I went and did the genetics. It shows that I don't have great uptake—I don't know the terminology—for my serotonin and my dopamine. But you know that's going to make one feel lousy. And when I would get a feeling of anxiousness, there would almost be like an edge to it where I almost feel like—

And I'm a happy person. I'm saying this so everyone who thinks, "Oh, that's not me," it could be you because it was me. And so, it's like I would go to this point of overwhelm and even a sense of hopelessness or despair. Then I would come out of it very quickly. But I would like to walk to that edge. And it was very uncomfortable obviously...

Dr. Shaver: And scary!

Shivan: ...and scary. But that's how I've been living my life until now. So, I got on low-dose naltrexone which helps with dopamine. And my whole entire being has transformed in terms of I don't feel despair anymore. I mean, of course, if something horrible happened. I would. But I don't live on that edge anymore. And I feel like, "Oh, my gosh! Is this how people that don't have neurotransmitter imbalance live all the time?"

Dr. Shaver: Right, exactly.

Shivan: What in the world? I have been suffering in this very quiet, intimate, on the verge of shame way like, "Why do I feel so different than everybody else? No one really gets me." And then, if someone really got me, like, "Wow! That person is so important to me because they're really understanding me."

I see it in my family. I really can't wait until I can hopefully help them with their neurotransmitters because I see that it is genetic, I see how my family has lived and how they could live now that I'm living that way.

So, just to anybody who can relate to anything I'm talking about, please investigate this. Phew, thank you for listening. It's just been—you helped me with my neurotransmitters as well.

And who sits around and thinks about "Hey, well, my quadriceps are doing great. My biceps are doing great. How are my neurotransmitters today?" No one talks that way.

Dr. Shaver: Even the word "neurotransmitter," people are like, "I think I've heard of that before. What does that mean? How do you go about it?"

But I've done what I'd call targeted amino acid therapy or neurotransmitter balancing,

gosh, for 18 years. And it's so easy. You just use basically the breakdown of nutrition. You'll be able to feel whether your balance that day and if you're taking the right dose that day.

And so, every person, again, individualized medicine. You could have a big, burly guy with severe depression and severe anxiety take a very low dose, or you could have a petite person with mild symptoms really needs to go high on their dose because it all has to do with the internal biochemistry and our receptor years being able to take that signal and tell the brain and tell the body, "This is what you need." So, it's individualized. You can't have a standard dose for every person.

Shivan: And there are tests for that.

Dr. Shaver: And there are tests for that. I use questionnaires as well because I like to try to keep the total cost of tests down. I know I have colleagues who are test-happy. These patients are spending thousands and thousands of dollars on tests. And if the patient isn't getting better by just using questionnaires and symptoms and getting to know them, then I will do testing...

Shivan: ...for neurotransmitters...

Dr. Shaver: ...for neurotransmitters.

Kiran Krishnan: Now, on the good side of it, there are bacteria in your gut that make things like GABA. GABA, we know is really important for calming down at night, being able to go to sleep, kind of having more positive thoughts in general. Most of the serotonin, the happy hormone, in your body, 90% of it is produced in the gut. Dopamine which provides the reward centers of your body or your brain with the motivation to do the things that we know are good for our system, that is produced largely in the gut.

So, here's a connection that's interesting. As we start looking at more and more conditions in our world around us that disrupt our microbiome, and we start seeing the prevalence of issues that are developing—for example, autoimmune disease. I mean 30 or 40 years ago, we might have had a fraction of the number of autoimmune disease that we have now; autism spectrum disorders, allergies, cognitive impairments, and even things like anxiety, depression, all of these things continue to rise quite significantly. And there's no explanation for why that is.

Kiran Krishnan: Well, as it turns out, it may be because we continue to pollute the environment around us that actually causes disruption in the microbiome. And when we start depressing and suppressing and killing off the bacteria whose job it is to prevent those types of things, then we start to see a prevalence in those.

And so, there's a really direct correlation between autism spectrum disorders and the type of microbiome that you have; anxiety and depression and the type of microbiome that you have; Alzheimer's, Parkinson's, all of these brain dysfunctions and the type of microbiome that you have; even multiple sclerosis, neurological dysfunctions and the type of microbiome that you have.

So, your microbiome is controlling so much of all of that. And so, it goes well beyond digestion, right?

Trudy Scott: And when we've got low levels of serotonin, it can affect our digestion. It can make us more anxious. And it can affect sleep. It can increase our cravings, carbohydrate cravings.

So, the amino acids are pretty amazing for people who have digestive issues and SIBO specifically, because we've got to get off the carbs, we've got to change our diets. And often, when we're needing to make these dietary changes, we feel deprived. You've got these cravings. And we're using will power.

But the amino acids are pretty amazing in that they help with the cravings and the emotional aspect, and then also help with some of the digestive symptoms that we see.

Trudy Scott: There's a number of studies showing that essential oil or peppermint ingested as a capsule can help with IBS. And I found that, topically, it can help. So that works for me to help with some of the bloating.

And then, the other two things that help is GABA which is one of the amino acids. And there's actually research showing that GABA helps with reducing the visceral pain that is seen with IBS. We've got GABA receptors in various different parts of the body. And GABA is amazing for physical tension. So, if someone's got physical anxiety and physical tension, it can ease that. And I'm thinking that's a similar mechanism as to how it works with some of the pain issues.

And then, the other one is tryptophan. Oh, I was going to hold these up. So, this is GABA. This one [GABA T-SAP Supplement] actually is a straight GABA product that has GABA and L-Theanine in it. And combined, that one works for me.

I do want to mention something about GABA, GABA works most effectively when taken sublingually. I just chew a capsule and get the results. And it works within five minutes. And then, the other thing that I use at night is tryptophan. And I think we want to talk a little bit more about GABA and tryptophan in a second in just a little bit more detail. But this really helps with sleep as well.

So, this helps boost serotonin levels. It actually helps with motility. There's research showing that it helps with motility. And then, it helps with anxiety as well if that's an issue (which obviously, with a lot of people with IBS and SIBO, anxiety is an issue).

Razi Berry: So, we can talk about some of the emotions that are involved. And what's really interesting is there's a study—I'm going to try to pull up this study. This study was in the Canadian Medical Journal in 1962. And it was studying, of all things, the physiology of diarrhea. They did this test with like balloon tests inside various parts of the large intestine. And they found that hypomotility of the sigmoid, of the colon, resulted from emotions such as hopelessness, sadness, dependency or feelings of inadequacy or even rejection, and then anger, resentment, hostility. And

even strong emotions that aren't necessarily negative, like courage, increased the sigmoid contraction which caused constipation.

So, if you think of these emotions like hopelessness or despair or sadness where you're just kind of giving up, you just feel hopeless, and you're giving up, you don't feel like you have anything to hold to, it's interesting that those are the emotions that they found in the study cause diarrhea because it's like you're not holding on to it. And in diarrhea, often, it's that lack of motility that allows these to sort of pass through and cause this poor absorption.

And then, it makes a lot of sense also, if we think about it, that these strong, often negative, emotions like anger, hostility and guilt means sometimes we're holding on to something, like we're not being forgiving, or we're holding on to anger. And that causes the constipation.

So, it really makes a lot of sense from a cognitive view of how we deal with emotions. Another important thing is when you're having some of these symptoms of irritable bowel or SIBO, again, the small intestine is where most of the chemical digestion takes place. And so, the anger, we're really holding on to these things, and jealousy (that's another emotion), envy, in Chinese medicine, it's the liver that is associated with things like envy and anger and even competition.

And so, that's why envy and jealousy can cause gastrointestinal reflux. Sometimes, it's called the sour stomach or you're "green with envy" because green is the color that's associated with bile. It's kind of a putrid, greenish-yellow—it's actually a very beautiful color. But that's why jealousy is sometimes called "green with envy." It comes from the traditional Chinese view of bile coming from the liver. You're not properly digesting your food, and you're not properly digesting your emotions.

Razi Berry: Now, in the Indian view of digestion, it is the place where we also digest for emotions. And if we think about it, Shivan, it's really important that emotions are something that need to be processed. They're not the same as thoughts that you can let come and go. And so, our body can kind of hold on to or let go of—

And sometimes, in irritable bowel, you're seeing both happen. Oftentimes, what the research says, is it's not even really a malfunction or a dysfunction. It's more of an exacerbation of normal motility.

Throughout the day, intestinal motility and peristalsis and digestion changes depending on what part of digestion, you're at, like at what stage of digestion you're at. And so, it shows that it can really slow down or speed up. And maybe it's less about the inflammation according to some of these bolder research studies.

Now, of course, most of the research that is done is focusing on inflammation. Let's remember that inflammation in itself is not something bad. Inflammation is a part of healthy metabolism. Inflammation is kind of the army or troops being sent into an area to heal or even to do regular metabolic processes such as bringing in nutrients and let go of waste.

It's interesting that until about, I found through my research, 1968, inflammation was last looked at as a cause. There was some more of the emotional aspect talked about. Isn't that interesting?

Shivan: Talk about some more of the emotions.

Razi Berry: Shame is something that has been shown to really affect digestion. And shame often leads to dysbiosis or leaky gut. And it's because shame is often an emotion that we need to not deal with. There's a constant meme on social media saying, "Let go of shame." Shame is something that we shouldn't walk away from. Shame is an emotion that we need to take a good, hard look at. What is it asking us to do? It's asking us to make a better choice.

This happens all the time in the idea of food shaming. Somebody makes a bad food choice. And if someone comments on that, they say that they're food shaming that person. We should never do that. But when someone listening here is making a poor food choice, and we feel ashamed, I think that it's wrong to disregard that shame or say that that's not being good to yourself.

Every emotion that comes to us—and we notice through the field of phenomenology, the philosophical field of phenomenology and embodiment in psychology. It tells us that all emotions play a role and should be paid attention to.

Razi Berry: And so, when it comes to issues of digestion, blood sugar, diabetes, irritable bowel syndrome, SIBO, obesity, it's important to understand that there are complex emotions involved in eating—and shame can be one of them. And what is shame asking you? Shame is maybe saying "Don't do that anymore."

Your body, that luminal canal, some of these emotions we talked about are actually not science fiction. The chemicals of emotion that we are feeling in our hearts and in our brain and in our body are actual, real substances. They're not just brainwaves. They're substances. They're emotions. They're hormones.

And to disregard them is a mistake. When you eat food that your body, through chemosensing feels is not good for you, you will have an emotional reaction. And when you start listening to those emotional reactions, we choose better foods. We can feel with your body you can start to make the choices to heal yourself.

Shivan: And a traumatic brain injury sounds like it really should be something where there's an ambulance and where there's sirens and all that. And it just

simply could be that simple.

Dr. Kayle Sandberg-Lewis: Right! And there has been an uptick with the increased awareness. They're reporting more kids are being taken to the ER after playground accidents and that sort of thing. But you think of all the—well, my age, we were free range. You were just expected to dust yourself off. There was nobody thinking there was a long-term event, or long-term effect.

What really is huge in the research now is the change in perception. So, we are now thinking of brain injuries as a process, not an event. So, things start with the initial blow—I mean, mouse research. Within three hours, there are changes in the gut after a very minor TBI. And then 72 hours, there's bigger changes. And then, a week out, there are huge changes with the contents of the small intestine being leaked into the blood supply—which goes back and causes more problems for the brain.

So, if you were listening to the conversations today, they were talking about how leaky guts and leaky brains go together. So, if you have your immune system in the brain all primed from having been hit in the first place or the injury having occurred, the jostling or whatever happened, and then the cytokines come from the gut, it just causes the inflammation to go berserk.

Shivan: So, are you saying to me that a traumatic brain injury again, without drama, just everyday life—causes leaky gut, or one of the reasons that leaky gut exists?

Dr. Kayle Sandberg-Lewis: Exactly!

Dr. Nirala Jacobi: There are studies that I know of that have used gutcentered hypnotherapy for IBS symptoms with over 70% ongoing response rate improvement. So that's tremendous for me. How do we explain that when we're saying it's all due to the bacteria? I think there's so much that you have to consider when it comes to SIBO. We need to really start thinking about other things besides always bacteria. I lecture practitioners about this all the time. It's not about that all the time. I have patients that are in extreme stress. And their symptoms improve when they actually start to really address that.

And I'm not talking about just meditating for 10 minutes—which is wonderful. But it's fundamentally you taking stock of your life and saying, "How can I change this? How can I change this for the better?" This is where a lot of people have to go. They have to really dig deep into their emotional states.

Shivan: And when you mean "deep," like dig deeper than you've ever dug before.

Dr. Jacobi: Yeah.

Shivan: And if you've done a lot of work, it's easy to go, "But I've already done that." Believe me, I'm speaking about myself and to myself when I say all of these as well.'

Dr. Nandi: And the last one, the last what I call pillar of our health is having a purposeful life. Shivan, we were talking about this interview. She's got a purpose-driven life. And everybody who knows her knows that she is driven to have people avoid the same fate that she had. When you have that purpose, guess what happens? That inflammatory response I talk about goes down dramatically. Your mind is not aimless. You're focused. You're focused. Even though you're busy, your body actually compensates and is much more in tune with what your goals are.

And why that's important? When your mind is wandering aimless and you don't know what you're doing, that unrest leads to inflammation. Not less than 10 studies are showing you can decrease strokes, decrease Alzheimer's, decrease heart attacks, decrease every disease that kills us if you have a purposeful life. It doesn't mean you have to change the shape of the planet. It doesn't mean that you have to save the world. It just means that you have to do things that give you purpose.

Steve Wright: I live in Boulder, Colorado, which is like a mecca for spiritualness and woowooness and therapy and things like that. And I have so many really, really talented brilliant friends who have done the mental and emotional work such that they think that they can control the physical part and not do the testing and not change their diet fully. Or they just go gluten free and they're like oh, that's all I need. Why would I have to spend \$500 on some tests. I can just be with it. I can just breathe through it or I can just asana my way through it. And I'm like cool. If you want to choose suffering, great. I mean you're very talented, you're very aware. You're very good with your pain network and how you've figured that out and you're still sick. Like I'm sitting on my porch in t-shirts and pants and they have like three layers of coats on. I'm like you probably have a thyroid problem. You should get that checked. And then the vice versa it was me who had spent thousands and thousands and thousands of dollars on testing and the latest tests. Oh, there's a new hormone test. Oh, there's a new PCR DNA stool test. Maybe I should just run the SIBO test one more time. One more supplement. If I add this one new cool supplement that will be it. And there's this thing called the law of diminishing returns and it's a force of nature. It just, you can't escape it. It happens everywhere.

There's also something called statistics and you can't escape those either. And so if you've been focusing in one area and you're still sick right now. If you're still suffering, pivot. Pivot out of that area, actually out of that domain. So, like if you've put all your time into supplements and diet, I would say just keep it there and stop reading about that stuff. It's your breakthrough, your next level on the health ladder as you go will not come in that area from what I've seen. I believe that enough to just kind of put that out there as a law as well. Because essentially, you're going to have to keep investing so much effort to get a small little chunk whereas you might pivot and just find out that you're really angry at your parents. And if you've got through that and processed that then all this could happen. Or your job is actually stressful enough that it's hurting you. Or that maybe there is something to this whole awareness meditation thing that we've been speaking about or the shame thing.

Controversially you may actually pivot out of the DIY area and say I'm going to hire a really well-trained practitioner who's actually going to run a thousand dollars' worth of tests. And that is your breakthrough. But whatever you're doing right now if it's feeling like you're stuck in the mud and it's feeling like you have to be that medical detective it's likely, it's highly likely, I would invite you to the idea that you have chased the rabbit too far in that direction and it's time to go like 90 or 180 degrees away from that and see if you made a breakthrough somewhere else. Because then that will just help bring everything else back up.

Steve Wright: When I say healthy, I actually love and hate the word healthy because everyone has their own definition, even your doctor, your practitioners have their own definition of healthy which you may not be enrolled in. You and I both have a different definition of healthy. I believe in defining what is health to you. And then don't let anybody move you off of that goal. And so, for some people, yes, age or a certain genetic predisposition or an accident or just enough damage has occurred such that organs are missing or limbs are missing or disease progression has gone deep enough that you're not going to be running a marathon. And I think that's perfectly fine. I actually believe you can find plenty of peace and plenty of happiness in that. And where I've gone lately is into the more spiritual, mental, emotional realms.

And what's really fascinating for people out there, especially SIBO because SIBO can be really painful. Like super painful. And I had a lot of that gut pain like I just felt like knives were just being stabbed into me. Is if you look at the back-pain stuff. There are-I could be misquoting this but I think there's something like 60% of Americans who have herniated discs. It's somewhere in that. It's so large you're like what? I might have a herniated disc because it's the majority of people have herniated discs. However, not everybody who had a herniated disc actually feels any pain. It's the small minority, something like again a minority of those people like 20% are like incapacitated. Like they cannot move they're in so much pain.

And I believe all of that pain is actually real to them. However, there is a large majority of those people in that pain who using different emotional like no opiates, no functional medicine can essentially turn that pain off and it's gone. I used to believe that it was all physical, that stuff was woo woo. That stuff was bull crap. But here's the thing. So, there's something called visceral hypersensitivity. I haven't spoken about this before because I haven't really formed out the rationale. We'll see how this comes out.

Steve Wright: There's something called visceral hypersensitivity that many people who have SIBO do suffer from. Now what's interesting with visceral hypersensitivity is that you can have two people and they produce the same amount of gas. But you can also have IBS people who produce a higher than average amount of gas and one person with visceral hypersensitivity will be in excruciating pain, physical pain. The other person with IBS is just gassy and maybe bloated. Maybe their pants don't fit that day. And to them it's just a nuisance and they want it to go away. And this person is like a crumpled up on the floor—dying, it feels like. At least for me it felt like that on bad days.

And I still had that. I've done everything. My gut, I check my gut twice a year. I run labs on myself. I don't have an infection, but I still had that until last year. And the only thing I spent my time on last year was things like the work from Brene Brown, deep work on myself through cognitive behavioral therapy, group therapy, authentic relating and some shaman works.

And it went away such that I now experience gas and bloating as I have before, but I have no pain associated with it. And that is mind blowing to me. Mind blowing. I don't know what to make of it. I don't know if my results relatable at this point.

I haven't dove into it enough because I'm still–I typically don't teach things until about a year past when I learned them because I like to go find other people, verify that I'm not a whacko and that there's other people that have seen this too. And then sort of kind of bring it into a strong picture.

But I think the strongest picture I want to show today is that even if you're not able to get fully healthy again or even if you are on that journey I want to offer the idea that there's a way you could do it potentially if you focus on the emotional and the mental in which it could be less of a struggle and less of a suffer fest. And more of an exploration of life in general and in health in general and it might contain a whole hell of a lot of more peace and happiness than what I experienced.

Rebecca Coomes: And my fifth thing that I commonly see is around mindset. Now this is multifaceted. It's around, obviously, stress and the way you think. But it's allowing time for things like meditation, relaxation, positive affirmations.

I am my own worst enemy when it comes to my mindset. I am that classic type A. I'm perfectionist, I'm driven. I'm always looking for the next goal, the next thing to achieve. And I don't give myself a lot of time to just be in the moment.

So, I have to work at it. And it's one of the things that I do, on a daily basis: "How can I pause and give myself some time?" Looking at things like how you are talking to yourself, what's the language you're using internally. If you're finding yourself thinking, "I'm so stupid. Why did I eat that cookie? God, I'm such a failure!", how is that mindset and that language going to help you recover?

What I do these days, because we're all human, and we're allowed to fail—and in failing, we're learning—if I eat something, I know is going to make me feel a little less ordinary, I will say to myself, "Well, Rebecca, that's a lesson. How do you feel from it?" If I've had some symptoms, I'll say, "Thank you, body, for sharing them with me. I've listened. And I didn't need to eat that cookie. But it tasted great, and I don't need to do it again for months." And I move on. I don't hang on to it.

Really allowing that time to be with yourself, to calm the inner overwhelm, and that negative chatter and the anxiety is really important with the condition.

Shivan: Shame, self-shame, and the shame of the poufy belly, and practicing compassion is so beautiful. And the keyword there, practice, right?

Rebecca Coomes: Right. This is a journey. And as silly as that word is, it's like,"Oh, we're on a journey," but it is a continuum. And it's a continuum until the day wetake our last breath.

We are never going to get to a finite point in time where we go, "Ooh, hallelujah, I've gotperfect health. And I never have to work at this again." Every single day, it is just a journey towards improved health and wellness. And it doesn't mean you have to have it perfected right now. I recognize my challenge is getting to bed early and working on my mindset, so I continue to work on that. Things like my nutrition come a lot easier

for me. I celebrate the wins and I continue working on the area that needs that ongoing development and support.

Episode 8: Health Cascade: When Gut Issues Spiral Out of Control

Dr. Michael Ruscio: So, let's talk about hormones and the gut and digestion. Like I just said, I know everything is related. But I don't think I realize how tightly related that was—like thyroid, estrogen and all that jazz with the digestive system.

Well, it's why I recommend that people not necessarily try to diagnose what is wrong with me based upon symptoms because the symptoms of adrenal fatigue and hypothyroidism and female hormone imbalance have a lot of overlap; but rather, to try to work through a hierarchy.

And that hierarchy would be, first, you got to have a decent diet, tend to your lifestyle. And then, if you're not feeling better, fix your gut because the adrenal symptoms, the female hormone symptoms, the thyroid symptoms may all be coming from your gut.

Yes, keep your conventional doctor looped in. And if they tell you you have a thyroid problem that needs medication, follow their advice. I'm not saying disregard what your conventional doctor is saying or to stop seeing your conventional doctor. But if you're looking for the underlying cause of a lot of these symptoms, the gut is often it.

And as it pertains to hormones, there are three main connections—adrenal hormones, female hormones and thyroid hormones.

Dr. Ali Rezaie: So, we have now proven that the bacteria in the gut do produce estrogen, progesterone, and testosterone. So, sex hormones can be produced by bacteria, no question about it.

So, whether we need to prove that controlling those bacteria how much it affects our sex hormones in our body—because, at the end of the day, the majority of the sex hormones in our body are produced by the glands inside their body, not the gut bacteria. But how much of that sex hormone produced by the gut bacteria is the subject of one of our biggest projects that we have. And we're working on it. Eventually, that may have a big effect on the management of multiple diseases that are sex hormone related. Think about it—all the way from breast cancer to prostate cancer, polycystic ovarian syndrome. So that's very important.

Shivan Sarna: So, just talk to us a little bit about what we should be thinking

about when it comes to the gut and hormones.

Dr. Nirala Jacobi: So, hormones are a big topic, right? You have hormones that come from your ovaries or from your testicles. You've got hormones that come from your adrenal glands that make you respond to stress, that regulate your blood sugar, that regulate your immune system. So, the adrenal hormones are really, really important. So maybe we'll focus on those if you've had the thyroid covered. And then I'll touch on sex hormones a little bit in a moment.

So, one of the big things that happens with chronic SIBO is that inflammation is likely to be high because, when you have a bacterial load in your small intestine that continually releases certain toxins that you then absorb—LPS which you know about is in the cell wall of gram-negative bacteria.

Shivan: What does LPS stand for?

Dr. Jacobi: So, let's say that you have SIBO, and your SIBO is mostly caused by what are called gram-negative bacteria. And that can be Klebsiella, it can be E. coli. It can be a number of those bacteria. In their cell wall, they have one of the most potent inflammatory substances known to man. And that is called lipopolysaccharide (LPS). So, when they die, these bacteria, as you're treating them, very often—or even if you're not treating them, they continually release this LPS. You absorb it, and your body just gets triggered into an inflammatory response.

That's why we often see skin conditions. We see joint pain. We see gut pain. We see all kinds of conditions and symptoms that are related to the inflammation that this has generated.

So, what your body does in response to that is like, "Whoa! I have so much inflammation. I'm going to release all this cortisol." Cortisol is your natural anti-inflammatory. Most prednisone drugs are based on cortisol.

That's your natural anti-inflammatory hormone, cortisol. Prednisone is like a thousand times stronger than your own natural cortisol. But that is what it's meant to do. It's just meant to stem the inflammation.

Dr. Jacobi: I'm not saying take prednisone. I'm just saying that's the model that this was based on. So, after years of chronic inflammation—actually, let's go back a little bit. So, let's say you have all this inflammation, and your body continually releases cortisol, what's going to happen to you? Very often, you have blood sugar dysregulation. You end up having a lot of fatigue because your cortisol is all messed up in terms of when it's being secreted. You may have insomnia. You may actually wake up in the middle of the night and can't go back to sleep. That can often be due to cortisol dysregulation.

So, after years of this, what happens is your adrenal glands are going to be so tired of secreting cortisol that you go into what we call classic adrenal fatigue. That's sort of an archaic term now. We call it more the HPA dysfunction or the hypothalamic pituitary axis and adrenal axis dysfunction.

So, all of your hormones can get messed up just because you have SIBO because you cannot actually control your own inflammation using cortisol. So, that's the adrenal gland.

Dr. Robyn Kutka: A hormone is a chemical messenger. It's made by an organ in the body or different cells and glands. The hormone is produced to go somewhere and have an action. It will go to a target tissue and maybe have a short

action like quickly changing somebody's blood pressure, or maybe it's a longer action like how a menstrual cycle is controlled over the month. But it has a job to do. And it's how our tissues communicate with each other.

Shivan: Okay, that makes it sound elegant and wonderful. And I guess it is a wonderful, elegant system. But when it's out of whack, it's a nightmare isn't it?

Dr. Kutka: Absolutely, yeah. It affects almost any system in the body. People can feel moodiness. They can have weight gain. They can feel depressed, fatigued, more pain, digestive issues, maybe even hair loss or skin conditions. Hormones are well beyond hot flushes and menopause. It may affect both men and women of all ages.

Shivan: And when we hear somebody has a chemical imbalance, could that also be referring to hormonal imbalance?

Dr. Kutka: Absolutely! Hormones, neurotransmitters, both of them. But I think one of the biggest things is really, the idea of the word hormones, for a lot of people, scares them. It's like, "Argh, I can't just do that." Hormones does not equate cancer. So, I think that's a scary thing for a lot of people and maybe haven't gotten a full information on what's really out there and how can we help people and do it safely for both men and women alike. And there's a lot that we can do.

Shivan: So, when we say hormone testing, that's kind of a loaded suggestion, not because of you but because of the labs across the country (if not the world).

Dr. Kutka: Of course!

Shivan: Is it spit test? Is it blood test? Is it both? What's normal? You know... it's a little confusing.

Dr. Kutka: Yeah, it's very confusing. There's a lot of different ways to test hormones. And it really depends on what you're looking for. So, there's blood work out there. Blood work is going to give you a snapshot and time picture of what your hormones are doing, what your total hormone content is. But hormones do this all the time. And over 95%, or maybe a little bit less or a little bit more, are bound to a protein. That's the bus that carries them around to the tissues. But if they're in that protein, they're on the bus, they're not doing any work. So, it doesn't really give us that much info.

You might test that for somebody who maybe, all of a sudden, had their period stop and you want to see what's going on. But it doesn't tell me what's actually happening in the tissues.

Whereas testing hormones and urine, you can see how the body is metabolizing them. We might do that for somebody who's a cancer patient, and we want to see how she's metabolizing her estrogens. But when you look at hormones in saliva, that's where you can see what's really happening in the tissues. A hormone has to be brought into the tissue from a receptor.

And it's what's in the tissue or what isn't in the tissue that's having an effect on the body and causing symptoms.

You can also get an average. So instead of getting that peak or trough, you get a much more clinically relevant result when we're looking at a salivary sample result.

Shivan: And so, you spit in a test tube at different times throughout the day?

Dr. Kutka: Yeah, it's super easy. You can do about four different times during the day. It allows us to map out some hormones, like our cortisol levels that we can chat about, but also to get an average over what's happening for that full day.

Dr. Steven Sandberg-Lewis: Another really important thing is the thyroid adrenal, which is something I made up. Thyroid gland and the adrenal glands are so important in normalizing blood sugar, maintaining bone mass, helping with mood and energy and blood sugar, very, very important, and blood pressure as well.

Those glands are so important for the maintenance of normal function. And so often, in standard medicine, the only time you really look at the adrenals is when there's 90% of their function gone. That's called Addison's disease. It's very rare. It's an autoimmune disease.

Or when a person has Cushing's disease, which is when their stress hormone, cortisol levels are so high that everything goes haywire, and we can actually die from it. Very serious condition, which is a little more common than Addison's.

But in naturopathic medicine and other forms of natural medicine, we like to look at the adrenals before they're 90% gone because many people have a lot of dysfunction there, and you can't really—in my book, you can't really separate thyroid from adrenal. They work so closely together.

Dr. Steven Sandberg-Lewis: So that's my suggestion—balance your adrenal and thyroid function, so that your blood sugar can normalize, so that you can lose the weight around your waist because that's one of the better ways that we have of measuring abdominal fat or that apple fat.

The waist circumference for women, over 35-inches is too much. For men, over 40-inches is too much. And so, it's easy enough to say, "Oh, lose that waist circumference. Bring it down. Just get to it."

Well, that can be almost impossible. If your insulin levels are very high, and your DHEA levels are very low, and your cortisol is very high, that's the worst group of hormonal levels that can lead to a waistline that just gets bigger and bigger.

You could lose weight all over your body. Your face might look amazing, but you can't lose the weight around your waist. And that's the weight that's controlling the whole blood sugar issue, which causes GERD and causes SIBO and other digestive problems.

So, the thyroidrenal, if you would, gland is really important there.

Dr. Mona Morstein: Cortisol is kind of like, I'm so bad with my fairy tales but is it Goldie Locks with the bears, you know cortisol needs the middle chair and the middle bowl of oatmeal. If there's not enough cortisol there is development of gut inflammation. And that's a problem because from gut inflammation we can lose our protective mucus lining, we can start changing our microbiome, we can start breaking away the IgG immunity there and start reacting to what would necessarily shouldn't react to and so forth. But if you have too much cortisol for over time it's also inflammatory to the lining of the intestine as well.

There are so many ways to work with people along that level of cortisol. Whether it's getting— if a person or a couple needs counseling, if we need to address their sleep, their stress relaxation, do they do journaling or gratitude, do they exercise, are they creative? Do they take time, you know to relax, do they get into nature? There are just so many ways, you know are you off your technology? There are just so many ways to broad-based look at ways that people are feeling bad.

We can also of course do homeopathy. I do that quite a lot with people. There are, of course, supplements such as nutrients that support adrenal hormone functioning, there are botanicals that support and help balance what we call adapter genes, that if the cortisol is low it can raise it up, if it's high it can raise it down.

And of course, diet, right? What you eat and drink can be very supportive to adrenal healing or very problematic to adrenal healing. We can also get into methyltetrahydrofolic law because the adrenal gland needs a lot of methylated enzyme reactions to have it function well, so it's a broad-based look at both, since we do know that there is inflammation with SIBO, whatever else may be happening in their lives, if we're trying to heal that intestinal lining—heal the lining, heal the leaky gut, heal the nerves... having a pro-inflammatory state is going to work against us in that regard through the cortisol.

We don't treat the adrenals in homeopathy we treat the person who, at that moment, is feeling particularly stressed out. I'm gonna have to learn a little more about that person and then prescribe a remedy that helps them balance better in their life and in how they react to situations. You know B vitamins of course are very useful to the adrenals, pantothenic acid, Vitamin C, we have a lot of Vitamin C stored in the adrenals. Botanicals, of course everything from rhodiola to withania to the eleutherococcus to the ginseng, magnolia, a lot of just well-known herbs, botanicals
that can be put into a formulation based on really what we need to specify for that patient.

One other thing with cortisol, sometimes a good balance when we're working with the adrenals, sometimes I might prescribe DHEA or pregnenolone which are at opposite poles where cortisol can wear tissue down, DHEA can rebuild tissue. So sometimes at least temporarily, we're just trying to get that balance and offer that to the body and to the gut as well.

Dr. Robyn Kutka: I think so many people are scared of it and think of cortisol as this big, nasty hormone which causes their weight gain and all these things. But cortisol is this hormone that our adrenal glands put out. They put out a baseline amount every day, a bell curve—or not a bell curve, but higher in the morning and slowly comes down throughout the day. It helps us feel energized and awake. It helps us handle stress.

And during stress, your brain tells your adrenal glands, "Hey, there's a stress here. Put out that cortisol." So, we do.

We put out cortisol for the stress. The stress goes away. And we go back to our baseline.

But during chronic stress, the brain stress, "Oh hey, that stress is here. Make some cortisol." So, we make the cortisol. "Oh, that's another stress, do that again. Ooh, it's still here. Can you do that some more?" And so, we do. And we're in this perpetual state. But our bodies can't keep up with that. And so there becomes this dysregulation in that beautiful pattern, and eventually, a down-regulation. And that allows the body to be able to keep up with that chronic state of stress. And that's called in medical literature HPA axis dysregulation. Fancy terms! Everybody else calls it adrenal fatigue. It's just technically called HPA axis dysregulation. But it's a true thing.

And when that happens, and we have this lower level or maybe we have a tiny spike later in the day or something, we can see differences in our sleep-wake cycles. But people don't feel well.

Most people don't come into office with elevated cortisol levels. They don't feel bad yet. It's once those levels are lower, they feel tired. Things ache more. Cortisol is the same thing as hydrocortisone. It's our body's natural anti-inflammatory. So, there's pain.

By this point, they've already gained weight and now they can't get it off. Fatigue is the biggest thing. They've been to every doctor, and they're told they're fine. It's in their head. "Oh, it's just aging." Nothing is just aging. Don't settle for that answer. You can feel as good as you want to.

But usually, there's some form of cortisol dysregulation for people. Everybody is under stress just by the nature of our society at this point. And that cortisol is part of our—or let me back up here for a second.

Dr. Kutka: Our body has two states. It has that go-go-go, "I'm really stressed just running from that saber-toothed tiger," and then it has its rest state. And most of us are living over here, in this go-go-go. And there's a dysregulation between those two little systems that we're seeing present as chronic stress and HPA axis dysregulation.

But the neat thing for all SIBO folks, that system—your rest system—that's done by the vagus nerves. And that partly what enervates our digestive tract. It helps determine how fast it goes. And so, a lot of SIBO, could it actually be a dysregulation of that system. So by overlooking that, by not dealing with the stress, by not tonifying the vagus nerve, I think we're doing a really big disservice and maybe actually a stumbling block to not getting over our digestive symptoms.

Shivan: Let's soak that in for a second, yeah. Yeah! You're not the only one who thinks that.

Dr. Sandberg-Lewis: Hypo– is... Hyper–, I don't know if it's a 10th or 12th of the amount, but yes, they're both big deals. And that's in part because of our environment because we know that xenoestrogens and other environmentally produced hormones often from plastics and phthalates, those are ubiquitous in our environment, and they tend to affect the thyroid.

If we could just do one shout-out, if this has not happened before in your series here, men and women, especially women, please don't drink water out of those crinkly-soft plastic bottles.

Don't do that. Don't do that. Stop doing that. You're getting phthalates, you're getting plasticizers that make the plastic soft and pliable, you're getting those when you're drinking it, especially if it's sat out in the sun and got too warm. And even if you cool it off again, you're getting factors that are throwing your hormone balance off in a major way.

And it's totally avoidable if you can avoid those kinds of plastics as much as possible.

Dr. Michael Ruscio: And we also know that there's a high association between SIBO and hypothyroidism. And to the medication piece, I've seen a number of cases that we're able to decrease their thyroid medication or it was just so apparent that their endocrinologist said, "Yeah, we need to cut down your levothyroxine dose" or your dose of whatever medication that they're on because their hormone levels in the blood were going up, up, up, up, up. Why? Because they were absorbing their hormone better. Therefore, they need less.

Shivan: Got it! Can you just tell me hypo– versus hyper– in case someone is like me and gets those confused?

Dr. Ruscio:	Sure, I'll zoom us out a little bit. Hypo– means slow, hyper–
means fast.	

hyper is fast. Okay, that's easy.

SIBOSOS.com | DigestionSOS.com | Digestion SOSTM Documentary Series Episode 1-10 Transcripts © Chronic Condition Rescue | All Rights Reserved **Dr. Ruscio:** So, hypo–, you do not have enough hormone. It's more so associated with fatigue, a marginal amount of weight gain, potentially constipation. Dry skin, dry hair, dry nails are some of the most common symptoms. And then, hyperthyroidism, people can also be fatigued, but it's more you're too sped up.

Shivan: Wired, but tired?

Dr. Ruscio: You're burnt out kind of fatigued, exactly. There can be hair loss or insomnia, racing heart and feeling hot are probably two of the more distinctive symptoms of hyperthyroidism or Graves.

But we know that the autoimmunity that underlies hypothyroidism (and possibly hyperthyroidism) can be improved by improving one's gut health, that you may need less medication. And then, perhaps most importantly, the symptoms that you're attributing to hypothyroidism may actually be driven from your gut.

And so if you're on medication, and you're saying, "These symptoms still aren't responding..." Yes, sometimes there's a need to change the medication but if you're in the normal range—and people criticize, "Well, my endocrinologist isn't using narrow enough ranges" or "I've heard whatever..." Yes, there's a time and a place for that.

But I would first say look at your gut health because the fatigue or constipation or the weight gain or the depression or the brain fog that you're experiencing may not be because of your thyroid; it may be because of your gut.

And again, it's not to say it couldn't be a need for more of an investigation into the thyroid. But I can't count the number of patients who've come in thinking that they need more of a detailed thyroid evaluation. We improve their gut, and all those symptoms go away.

Dr. Ruscio: So, one thing that I would offer the listeners that might be helpful is making sure that, if they're being tested for thyroid, that there is actually a simple test that you can run that delivers a lot of benefits. It cuts through a lot of the confusion of the more advanced, "Your T3 levels and your reserved T3 ratio is with the T3..." That's all fine and good. There's a time and a place for that. But I found that, usually, when there's a downstream issue with T3 and reverse T3's, the solution is oftentimes—not always, but oftentimes—because of a problem with the gut. And so, the solution is not more thyroid testing and treatments. It's coming back to the gut.

However, it is important to identify successfully if you are hypothyroid. Now, in functional medicine, they call for these narrower ranges—which I think there is something that, however, what may happen is someone may be reading on the internet about these more narrow ranges, and they say, "Oh, according to this, I think that I'm hypothyroid." But I go to see my endocrinologist from my general practitioner, and they say, "Well, you're normal according to the conventional ranges." You say, "Yeah! But the functional medicine ranges..." And they say, "Well, we don't care about the functional medicine ranges..."

Dr. Ruscio: So, there is a certain methodology for testing your blood known as a dialysis methodology that may actually help you appear as hypothyroid according to the conventional ranges when you haven't otherwise.

And the long story short here is one of the typical methods that's used—and this is available through LabCorp and Quest—is an immunoassay methodology. It's cheaper. I think it's okay to use in general. However, the dialysis method filters out certain things that may confound the results. So, the different method of dialysis passes the blood through a filter, so to speak, that gives you more accurate results. And some studies have found that people who are near to hypothyroid, but not according to the more traditional immunoassay, when they have the blood drawn and tested via the dialysis method actually show up now as hypothyroid.

And they've correlated the testing with a patient presentation, and also being more successful in terms of the treatment outcomes.

So, if you're floundering with trying to figure all this out, you may not have the resources available to you to go through these really in-depth thyroid assay, this is one that can give you a simple answer of "Do I need to be on thyroid hormone or not?" If you use the dialysis method for your testing, then you will have a much, much more representative picture according to conventional ranges listed right on the lab if you're hypothyroid or not. And that can be a difference between your conventional doctor saying yes to a prescription or not saying yes to a prescription.

And that testing is available through LabCorp and Quest. You don't have to go to a special lab for that. It's just you have to select what of Quest or LabCorp repertoire do I want to use.

Dr. Ruscio: Without getting too detailed here, but if you have, according to the conventional ranges, high TSH paired with low T4, then that is indicative of hypothyroidism.

Shivan: Can you say it one more time before we move on?

Dr. Ruscio: Yeah. So, according to conventional ranges—so this means the lab (if it's LabCorp or Quest), they will flag it high or low. If you are flagged high TSH coupled with flagged low, usually, free T4, then that is indicative of hypothyroidism. And those cases, for the most part, will need to be on thyroid medication for the rest of their life.

Now, the higher the TSH is, the worst prognosis is in the sense that—I shouldn't say worse, but the higher the likelihood that they will be very dependent upon that hormone. So, if you have a TSH of 6 compared to a TSH of 61, that can indicate how forgone thyroid function is.

But what will happen in some circles is a functional provider says, "Your TSH shouldn't be above 2.5" even though the upper cut-off is usually 4 or 4.5 roughly depending on the lab.

So, the functional doctor says you shouldn't be above 2.5, someone comes in at 3.1. That's still normal according to the conventional ranges. And their T4 is also in the normal range, but it's sort of in the lower end. And they'll say, "Oh, your thyroid is kind of slow," and they give them a thyroid medication. They don't clarify that there is not a diagnosable hypothyroid condition present, but rather they're using it as a support.

And if that person stops seeing that clinician, and that just gets carried forward, or if they just keep getting the refill on the prescription, they could be years and years later on that thyroid hormone all the while thinking they have hypothyroid disease and not understand that they don't need to be on the medication. That's a little bit nuanced, but it's just important to understand some of those details.

Dr. Ruscio: Sometimes what happens is—if I'm just going to be honest here. You get a thyroid fanatic, someone who thinks that everything is caused by the thyroid. And they're not practical, and they're not being discerning and judicious. And they've swallowed the pill—pun intended here—that thyroid problems are the cause of all ills. And they start treating everyone as such.

There's this old adage of "If all you have is a hammer, everything looks like a nail." So their hammer is thyroid hormone.

But in people who have levels of thyroid hormone that are too high—as in hyperthyroidism as we see in Grave's—one of their symptoms is falling hair and losing hair.

So, when we look around, we very clearly can see that thyroid can be very helpful where it's not this panacea where you just give more—you just give more T3 and someone's going to feel better. We want to get you into the normal range, that's step one. And then, rather than getting super particular with detailed ratios, I would next look at your gut health because that may be the underlying cause of the non-responsiveness of your symptoms. Or even if your TSH is unstable, that could be due to malabsorption.

There had been some studies, for example, with patients with ulcers—so problems in the stomach—that can't get their TSH stable. They then give them a liquid gel tab of thyroid hormone that's much more easily absorbed, TSH normalizes, symptoms improve.

Dr. Ruscio: So, again, rather than trying to force your endocrinologist into putting you on Amour or NatureThroid or giving you the addition of a T3 hormone in addition to the T4 that you're already taking, rather than trying to get them to change their whole paradigm, it may be easier and more fruitful to try to fix your gut first. And then, after that, if you're still struggling, there's more advanced thyroid things that you can go into.

The point I'm trying to make is, we may be putting the cart before the horse. We're getting really meticulous with our ratios and our dosing's of different types of thyroid hormones if we do that before optimizing someone's gut health.

Dr. Nirala Jacobi: And then, in your digestive tract, you also have bacteria in the large intestine that actually secrete an enzyme that make you absorb estrogen better called beta glucuronidase. And so very often, this is an overlooked factor in people that have estrogen dominance which is a really big deal for women. People that have too much estrogen are more prone to weight gain, breast tenderness, PMS symptoms, but also breast cancer and those types of things. And sometimes, gut bacteria are involved in that because they secrete this enzyme that uncouples the estrogen that's meant for excretion. You're absorbing it, adding it to your own estrogen pool.

So, what we're all finding out about microbiome and the effect of bacteria is pretty staggering. And that's just one example. That probably the whole hormonal talk could be just an hour. But those are two examples of how hormones can be affected with SIBO and also LIBO.

Dr. Stefani Hayes: I think the relationship came about over several years of practice, especially with a lot of my patients who had unexplained infertility, or fertility struggles from PCOS or endometriosis. And a lot of them didn't have GI issues. Some of them did. But because a lot of my colleagues are experts in SIBO, when I got to the end of my list of things that I was doing with them, and was looking for other things to explore, we started trying SIBO tests on a lot of my patients, and surprisingly, many of then came up highly positive usually with a methane-type SIBO overgrowth, which was really surprising for us.

And a lot of them didn't have the constipation pattern that a lot of methane-type SIBO does. But oftentimes, with that, they had had constipation as young adults or young kids, but had learned over the years how to manage it, so they came in and it was no longer a struggle or an issue, so it wasn't even something that they brought up. And sometimes literally never really struggled with much GI stuff beside some occasional bloating.

But when we addressed that aspect, it seemed to make a significant effect on her pelvic bowl health and their women's health.

Shivan: That's so interesting. They probably figured out how to do the magnesium or whatever over the years.

Dr. Hayes: Yes, and what to eat, what not to eat, and self-selected with their diet, self-treated with their diet, and so then it was no longer an issue because most of my patients are usually in their mid to late 30's or early 40's, when they're coming in to see me. And that's a lot of time to manage your bowels. And so, to get to that point, it usually was not an issue. But then they were struggling with other women's health issues and fertility issues.

Shivan: That is so interesting. So, once the SIBO was resolved, how did the fertility rates go up?

Dr. Hayes: There were a lot of my patients who did a lot better. Some got pregnant on their own, naturally, and were able to hold their pregnancies and have

sweet, little kiddos.

Others tolerated IVF a lot better, and were able to start ovulating on their own with PCOS, if they hadn't before, or were able to, with endometriosis, there's oftentimes endometriosis is really tricky, and so patients who had had multiple surgeries, and then it re-grew, I definitely saw sometimes after we balanced out the SIBO that the endometriosis would re-grow slower, or not at all. We would just get a little bit longer window between those surgeries, so that those patients could have more options for trying to get pregnant.

Shivan: Why do you think that is? That the translocation of bacteria into the small intestine would have so many ramifications. Do you think it was a physicality where simply there was the distention, and so it messed up the geography there physically? What do you think it was?

Dr. Hayes: I thought about it a lot, and an aha moment for me came while looking at one of my colleagues' videos. He's a surgeon who does a lot of endometriosis surgeries with laparoscopic medicine. And he takes the video during the surgery. And he was moving aside the small intestine to get to the uterus.

And it was a good reminder for me about your basic locations of anatomy, and how the organs snug up against each other. And because the small intestine does really overlay, not just the uterus, but over the top of the ovaries, and when I think about methane-type bacteria, it's a pretty noxious gas. And if I think about what that might be like, I imagine it would seep into the surrounding region. And for me, I like to have visuals of things that seems to me like a fog or a smog, if you will, that's in that whole pelvic bowl.

Dr. Hayes: And my perspective on that is that when the ovaries have this finite, very specific conversation that they have with the brain and with the uterus, and if there's a smog present in that, it makes for a really tricky conversation. So, if the ovaries are trying to talk to the brain, and the brain talks back down to the ovaries, the messages could get lost.

And so, in my perspective, I often then think about longer cycles, no ovulation for many months, and this miscommunication that happens with endometriosis, we're still trying to figure out why that happens. But why in some women does the immune system not notice the endometrial tissue sitting on the ovary, or sitting on the intestines, and things like that, whereas in other individuals, the body cleans it up really well.

And so again, it's coming back to that smog—if the neighborhood is not very happy, some other neighboring structures can really get affected, too, in my perspective.

Shivan: I wonder if it's the body's way of protecting the host—if the egg is surrounded by smog, and the body would be saying, "It's not a safe environment," beyond that communication thing you were talking about, I wonder if it's just survival of the fittest kind of thing.

Dr. Hayes: Possibly. We're not sure. It's definitely debated about the

role of how SIBO can get passed in utero or not, and if it can get passed with vaginal flora or not, because we're still trying to learn about all the nuances of how flora passes between the different parts of the body, between the intestine and the vagina.

There are all different theories about these microscopic transporters of flora, into the breast milk, and things like that too. And so, it's potentially adaptive if the body notices that there's a floral imbalance. That could be something for sure.

Shivan: I wonder if SIBO has anything to do with low sperm count.

Dr. Hayes: I think so.

Shivan: Really?

Dr. Haves:

Yes. I definitely look at it in my male factor fertility patients. And I think that the same idea about the local environment, that congestion can then be affecting the prostate and the blood flow into the testes, and through some of the small little tubes that are going through that region. And we've definitely had some luck.

The main place I see it in the semen analysis is more on the agglutination is one factor. It's where the sperm tend to stick to each other, and then have trouble moving around.

I've definitely seen improvement when we treat SIBO, if that's present because agglutination is not to happen when there is inflammation or infection. And classically, we thought about that more as prostatic inflammation or infection, but I'm thinking about it more broadly about intestinal infection, inflammation, like SIBO. And I've definitely seen that parameter really change.

I'm still watching with my patients to see if it helps with count and morphology. Some morphology is about the shape of the sperm and when they're not in a good environment to grow, it's hard to make the right shape, and so that makes sense to me that that could be a factor.

Dr. Jolene Brighten: Yeah, it really is. You know, I really observed this early on in my clinical career, that there were women who, they would come in-and so, I actually was going to be a gut doc.

Shivan: Oh neat!

Dr. Brighten: That was going to be my focus to begin with because I have my own personal journey of those things. But women come to me with like SIBO, yeast overgrowth. They had increasing food sensitivities. And we would only be able to get them about 80% better.

They were on hormonal birth control. And they would say to me, "Well, you know, I'm

doing all this work to get better. I just wonder if I came off, what would happen." And what we would notice is that they get like 110% better. So, they would exceed expectations.

And this made me wonder, "What is the pill doing? What role can hormonal birth control have in gut health?"

And as it turns out, it's a medication that's well-known for inducing intestinal hyperpermeability—which is leaky gut. One of the three ingredients for developing an autoimmune disease—which is no joke given that who suffers from autoimmune disease? It's mostly women. And with the pill, there's an association between lupus, multiple sclerosis. I have seen women, they start the pill, now they have a diagnosis of Hashimoto's. And I think the most staggering is the link between the pill and Crohn's disease.

So, a study came out of Harvard saying that for any woman with a family history of Crohn's disease, you spend five years or more on the pill, and you're at 300% increase risk of developing Crohn's disease.

Now, there's some people who are like, "Oh, you get Crohn's disease..." If they don't understand you're going to have ulcerations throughout your intestinal tract, that you could possibly perforate those, that means they can break open, spill open, this is life threatening; not to mention nutrient absorption, it's a chronic disease, there's chronic pain. It's a very serious thing that we need to be talking about.

But the other thing with hormonal birth control that I think a lot of us don't understand is—you know, I personally went through this and I have a lot of patients go through this—the increasing of food sensitivities.

So, you're on hormonal birth control, you have leaky gut, and now you're noticing "I'm gluten intolerant. I'm dairy intolerant. I'm egg intolerant now. I'm soy intolerant. Now, I can't even eat a vegetable. What is going on here?"

And this is where we'll see that doctors keep pulling foods out of the diet. They keep doing what I call—you know, it's basically the definition of insanity. I mean, that's Albert Einstein's words—doing the same thing over and over, but not getting results.

And it's as if it's not okay to question hormonal birth control, but that might be the root cause reason why you can't heal your gut, food sensitivities are increasing, and why you're developing thrush in the mouth, or yeast overgrowth in the vagina, yeast overgrowth in your gut. Those gut bugs are not just there— Well, they do so much, right? We can just give it up for them. But they're also there to defend their terrain to make sure that the ecosystem is in balance and kept healthy.

But if there's not enough of these guys to really throw down when the invaders come in, we see opportunistic organisms.

Yeast is not bad. We're starting to understand, just like there's a microbiome, there's a mycobiome. There is this whole fungal network going on. And we always want to

think like, "mold, bad... fungus bad..." But in fact, there is a reason why we've evolved to have these guys.

But being opportunistic, you just give them the opportunity to overgrow, and they're going to do it.

Jessica Drummond: With pelvic pain, there is a lot of overlap between the digestive function issues like IBS, which, as we know, is very often related to SIBO, constipation, IBS with diarrhea, mixed IBS cause pelvic pain is related to many different factors.

I want to make a quick note before all the men on the call run away, there are lots of men with pelvic pain after prostate surgery or just in general because pelvic pain is often related to a musculoskeletal challenge— myofascial muscle and joint and hip issues and pelvic floor muscle spasm and tightness. It's a piece of the puzzle with pelvic pain. While men don't have ovaries, they certainly do have pelvic floors, and there is a challenge in male pelvic pain, which can also be related to SIBO and functional gut disorders.

But for women, it's more challenging to some extent, especially when it comes to looking at the fact that our gut motility can vary with the menstrual cycle. A lot of times, women's pelvic pain is related to reproductive organs and exacerbated premenstrually and premenopausal, but only premenstrually when you're looking at a monthly cycle, sometimes, just before ovulation or at ovulation or just after ovulation when estrogen drops, there are hormonal shifts that affect gut motility.

As you said, there is also what we call "organ cross-talk." If you have endometriosis, which is the number one cause of pelvic pain, you might also have bladder issues like interstitial cystitis. You might also have SIBO or other underlying causes of IBS or constipation. There is a neurologic interconnection due to the close proximity in the pelvis. I like to think of the pelvis as this bowl where all of these physiologic systems come together—your genital system, your reproductive system, which is influenced by hormones, your gastrointestinal system, and the pelvic floor and myofascial systems of the pelvic floor, of the lower abdomen, the lumbar spine in the hips.

Shivan: I think that, for a lot of people, a lot of men, I should say, it's like they'd have to lose a finger or lose a toe or something to actually go to a doctor versus do regular check-in's and kind of have the idea of "your health is important." Let's catch things early. And let's talk about how all your different aspects of your life can impact your overall health.

Dr. Crane Holmes: Right! I mean I have even had patients—I have a 60-year old patient right now who has had IBS since he's been seven years old. And it was just up until recently he told his wife. So, he'd been married to his wife for 30 years and never told her that he was having issues with IBS and had to use the restroom up to 10 times a day.

Shivan:

Oh my gosh!

Dr. Holmes: to find out his truth.

...because he was so ashamed and so nervous for people

Shivan: My heart breaks for him. What else do you see that men really need to be thinking about for their health? And what do you see is a challenge that they face regarding maybe even gut health?

Dr. Holmes: Mm-hmm... I think, honestly, the biggest thing that I noticed is just coming to see someone like myself before things are really wrong. Definitely getting in and just doing regular screenings and just talking about how things are going and just establishing a rapport with a doctor that you trust and feel like you can follow up if things get worse, that I think makes the biggest difference.

I also think that men can commonly hide their feelings and kind of stuff things down. And sometimes I talk with some of my male patients how the colon in Chinese medicine, the large intestine in Chinese medicine, is associated with grief and anger and sadness. So, for some of them, if they're having digestive problems, just thinking about, "Okay, what else could be going on that maybe they're not sharing or not talking about?" Maybe I'm not the right person to share that with, but I say at least, again, try to plant that seed just to see what else could be going on that are causing issues.

Shivan: And it sounds like we're making gross generalizations. Look, this is for everybody of course. But the topic of men's health I think is—even if it's the exact same information that's being said about everybody, to have that title on it and the positioning of it, I think is super important because very few people are talking about it with this lens, with this topic, with this headline.

And I see a lot of guys suffering even in the Facebook group and stuff. They're just watching. They're hanging out. Occasionally, they'll chime in. But a lot of times, they're left to the side because they self-selected. But I just want to encourage everybody just to—even if it's just like 10% more, just a little bit more, to participate, to get in the conversation, to make that doctor's appointment, and to know that it's worth it. It's really worth it.

Dr. William Salt: At least three-quarters of your immune system is located in your gut, typically communicating with the immune system throughout your body in your defense. Your gut lining is richly supplied with blood vessels. The gut is like a sixth sense with a surface area larger than a football field where it communicates with your other environmental interfaces with the world—skin, mouth, sinuses, respiratory tract and cervix.

And your gut harbors trillions of microbes, mainly bacteria weighing as much as your brain does. It plays a very important role in both your digestive and overall health. And this gut microbiome is in constant dialogue with both your gut and brains.

Dr. Tom O'Bryan: What is this thing, the leaky gut? Some of us have heard the term before; some have not (it sounds pretty weird). The geek word for it is pathogenic intestinal permeability. The slang term is the leaky gut.

So, what is this thing, the leaky gut? And why is it important? First, why is it important? Intestinal permeability is the gateway into the development of autoimmune diseases. What does that mean? It means that it's the initiating problem that's going to manifest somewhere in your body, but it starts in your gut.

Hashimoto's thyroid disease, multiple sclerosis, rheumatoid arthritis, lupus, losing your hair (alopecia), having psoriasis, Alzheimer's, Parkinson's, plugging up your pipes, cardiovascular disease, they all have this immune component that seems to initiate with the leaky gut.

So, that's why it's important to understand this leaky gut thing and how to identify it and what to do about it.

Dr. Michael Ruscio: Paying attention to the immune system is important. The more I practice in the field here; I think the thing that may be harder to work with is really the immune system. It's not that hard truthfully to kill bacteria or to reduce bacteria. But what's harder to do is to recalibrate the immune system to get along with your food, to get along with your gut bacteria and what-have-you. And if you look at the insults to our immune system, they're far greater, in my opinion, than the insults to bacteria. There are insults to bacteria, yes—fluoride in water, use of antibiotics and what-have-you, yes. But what seems to be more widespread is the lack of dirt and germs in the like from a young age. And that impacts your bacteria, yes, but I think it more deeply impacts one's immune system.

And there was one interesting study. I want to say it was in New Zealand. I may be misremembering. But essentially, a band of hunter/gatherers that also had the ability to use antibiotics regularly because of access to medical care, they showed that even though they had use of antibiotics that was much more approximate to that of those in the west, they had much more diverse bacteria in their guts and much healthier immune

systems.

So, I don't think we can put it all on antibiotics. And another component of this is it's just the way we live. Our immune system doesn't have great training. And so, because the training impacts or the opportunities for training and ideal development of the immune system seem to be very short of what would be optimal, I'm starting to think that the immune system in those cases that are challenging is oftentimes one of the culprits.

And this is where histamine comes in partially, potentially antihistamine protocol also, and other therapies that are emerging that may target the immune system and not just the bacteria in the gut.

So, that's my hypothesis right now. I think there's some decent evidence to support that. I may change that in the future. But that's something that I'm really thinking about more and more, looking at which is "okay, we've reduced your SIBO, and we've cleared out your Candida and your H. pylori, and your diet and lifestyle are all dialed in, yet you still seem to be reacting."

And sometimes, people go down the parasite road, "Oh, it's this parasite that no one can find. The labs can't see it." I think that's an antiquated concept that was well-intentioned. And I'm truly open to that should the right evidence be presented to me. But I think the thing that's more often missing is the immune system did not form well, and now you're just hyper-reactive. Your hyper-reactive to food and supplements and to the bacteria in your gut. And this is causing a problem. So, that's one thing that I think is important to bear in mind which is your immune system.

Dr. Ruscio: We know that improving someone's gut health can improve autoimmunity. We know it can reduce someone's need for medication. But I want to be very careful in clarifying... this does not mean to self-decrease or self-stop your medication. What it may mean is that if you improve your gut health, your blood work will show you no longer need as high of a dose of medication and that your prescribing doctor should clearly see that and will adjust your dose. I just want to be careful there because it's easy to misconstrue that.

Dr. Paul Anderson: If you look at modern research (like hardcore tumor biology research) from 2015 until now in 2019, and then in a couple of years before, there's literally thousands and thousands of research papers published, not just like a couple of fringy things, only about the microbiome and cancer.

Now, that doesn't mean everyone's rushing to do anything about it. But it means that it's on the upswing because, finally, we're realizing more in the standard tumor biology world that your gut immune system is both affected by cancer and cancer treatment, but also can positively affect your outcome with cancer—and some cancer treatments, even. So, it's an evolving area of science. And every time you look at newer papers—so like today, I'm going to present mostly things just from the last 18 months. Literally, there's that much stuff.

Dr. Anderson: What I always tell my patients is, "I do integrative oncology. And the reason is that my standard medical radiation oncology people need to know so much about a few things, they can't know about all these other things, like helping their gut and all of these wonderful things.

So, I think the important things are—and this is something that, again, not myself, but people who are actual tumor biologists are bringing out is both having cancer, and most treatments for cancer, push your biome in a direction that is unhealthy.

And the problem is it's not just unhealthy for your gut, it's unhealthy for your global immune system which means then some cancer therapies that could work won't work.

Tumors on their own without cancer therapy or with it can grow faster if your biome is off.

There's a lot of things that we don't want with cancer that the worse our biome is, go quicker. And the natural course of having cancer and treating doesn't make the biome better. That's the big picture thing.

Dr. Anderson: What they all kind of come back to is SIBO specifically is

very common after certain types of digestive cancers, especially if they have surgery to remove the tumor. And to the point that they're now saying, "Look, anybody who's had digestive surgery related to cancer should be checked for SIBO immediately."

The other thing is there's this relationship that starting to emerge. And you know relationships, you can argue about, just because there's more SIBO with this type of cancers, is it connected or not. They're trying to connect the dots now. And there's a lot of dots to connect. But SIBO is more likely to be present in people with certain types of cancers. And they started with, of course, digestive cancer. So that makes total sense, right? Kind of like H. pylori is associated with certain cancers.

But then if you go to the next step where they're actually learning and looking at how come these new targeted immune therapies for cancer, which the upside is they're not like the old chemo's that go and kind of completely negatively affect all cells regardless of whether it's cancer or not—that's the downside of traditional sorts of cytotoxic chemo. They knock out your immune cells often at the same time they're knocking out the cancer. So, you have issues there.

And that's a big part of integrative oncology, is if you're going to do that, we have to take care of your normal cells. You need those to make it, right?

But the new targeted therapies, they have some fallout to the other cells. But it's like this person, same tumor as this person, this person gets this amazing result, this person, it does nothing for them. Same kind of tumor! Everything, right?

And so, even if you take one step out just to the immunome and not the biome—10 years ago, the leading thought leaders in that area would end a lot of their papers with: "Maybe since these new therapies work on manipulating your immune system against cancer, we should give them to you before we wipe out your immune system."

Dr. Anderson: Well, it turns out that your microbiome—which is trillions of stuff inside your digestive tract, imagine that—it has a huge impact, both on your gut immunity, but also these little signals that get sent out.

So, the real punchline is that the better you recover your biome—because there's no way you get through cancer treatment without some effect on your biome—if you already have SIBO, or you're extremely dysbiotic, we will normally actually work on that through the whole process just to keep you from dropping too low, but a lot of people don't have it, and they do after treatment.

So, if you've had any kind of cancer treatment—and this comes from the standard tumor biology writing—you should be checked for SIBO. You should have your microbiome checked, et cetera. And you should do something about it—which is huge and very, very important.

Dr. Anderson: And the final thing I'd say—which was a theme in many of the papers that just came out—is if you take a very narrow linear view of it (which, in the SIBO community, you see this), there's a group of people that do really well. They'll do like rifaximin or some single therapy, and it just works for them, right?

Shivan:

Bless their hearts.

Dr. Anderson: And I don't get those patients if it works for them. The rest of the community, it's a multifactorial problem. So, it involves what you're eating. It might involve killing some stuff. It involves prebiotic stuff, changing the rest of your biome to not be open to these other creatures, all that stuff. That needs to be in the cleanup phase after your cancer treatment, or as you're recovering, et cetera. That needs to start being more and more of a focus for you. And so, yes, there might be an antibiotic approach or something like that, but really, it's the rest of the stuff that's done that makes that work better or not.

Episode 9: Chew on This: Oral Health And Your Gut

Dr. Nirala Jacobi: Yeah. You know, the oral microbiome is also something that hasn't really been addressed very well. But the oral microbiome can be affected. And very often, when people have mouth ulcers or issues in the mouth, it can be reflective of other mucosal problems.

So, it can actually be reflective of a leaky gut. It can also be something going on in the mouth teeth-wise. If you have a root canal that's still festering, that's a whole other kettle of fish in terms of chronic illness. But you can have a really disruptive microbiome.

So, what I usually do for that is oral rinses with folic acid because it's such a rapidly dividing cell. So swish and spit out. And then, also a probiotic swish and leave it in after the folic acid. So sometimes that's helpful. And I would seriously consider Candida, oral thrush, for that.

Dr. Adam Miller: So, we've got leaky gut. Everybody knows about that. People are throwing around leaky brain. And I think we need to be talking about leaky mouth. And it's a little bit enigmatic until we have better markers. But we do know as a matter of fact that, if you look at the number of cases of endocarditis, almost all of them grow out oral pathogens.

There are many animal studies now that show on autopsy that animals with advanced Alzheimer's changes, when they culture their brains, they have dental bugs in their brain.

I mean, look, understand that having a white film across your tongue is not normal. That should be pink. It shouldn't have red pebbles in there which indicate essentially a chronic inflammation.

But bad breath should trigger you to think about: a) Am I flossing? That's a big one. Am I harboring pieces of food in these interdental spaces? But b) Am I brushing my tongue? I'm not a big fan of tongue scrapers. I think people end up overdoing it.

But the two most common reasons for bad breath that I see are people are not flossing well and they're not brushing their tongue. And then, it's all because they have a disruption in their biome.

Jonathan Landsman: The bottom line is, in terms of poor oral health issues, I would like to see people think of this as the beginning of their gut, their digestive system, and how it influences a lot of things in their health—like you were just saying.

Poor oral health issues, infections that you mentioned, but also poor dental care, it's a really big deal for sure.

Shivan Sarna: So, we're not just talking about like brush your teeth after dinner and after breakfast and floss, like it's way beyond that. It's way beyond that.

Kiran Krishnan: So yeah, the oral microbiome is interesting. It's a reservoir for problematic bacteria in a lot of people. Now, there's a lot of good bacteria in the oral cavity, too. And of course, a lot of those bacteria are swallowed. So, they can end up in your microbiome causing problems.

But the biggest issue is the fact that they have direct access to your blood. We know how easy it is to make our gums bleed. You floss a little bit too hard, and they're bleeding for a little while. That means there's a very dense capillary bed of capillaries and vessels that supply blood to your gums and your teeth. And those bacteria are sitting right on there. So, any little abrasion in there, brushing a little bit too hard, any decay in your gingival tissue can allow those types of bacteria to penetrate into your circulatory system.

Now, when you develop a cyst, or an abscess, or colonization in your gingival tissue of bacteria that produce toxins, those toxins can be directly sent into your circulatory system causing inflammation. So, the example that you gave earlier, a lot of times people will have certain types of bacteria in the mouth that not only cause tooth problems, but they can cause systemic inflammation that leads to disease.

Dr. Adam Miller: The average physician gets very, very little education on oral health in medical school. We get far more medicine in dental school.

So, the extent of your knowledge about the mouth if you're going through a traditional medical track is maybe an hour for an outside dentist who comes in and gives a lecture to the students.

As an aside, the average medical student only gets four hours on sleep medicine as well. So, there's a lot of room for improvement there.

But we think about the mouth when it comes to what? Tasting. So, when those taste buds light up, that's a chemical signal that's being converted into a neurological signal that's clearly heavily influenced by the emotional centers of the brain—the amygdala, the limbic system.

We think about the mouth when you take a bite of something crunch in the morning, and oh, it stimulates a bowel movement 30 minutes later. It's called the gastrocolic reflex.

And we think about the mouth when things hurt.

But there's clearly far more going on with the connection of the mouth to the body. I know this because of the patients that I'll do a neuromuscular reset on in my practice. Simply by releasing their masseters and these muscles of mastication, people fall asleep in our treatment chair when I do that.

Why, when we're stressed, do we grind our teeth? What is that about?

So, I just believe that there's a lot more neurological signaling happening from the mouth to the brain and the rest of the body than we're giving attention to.

Dr. Rachel Fresco: I think the sinuses are a good tie-in here. I think that we really need to think about every place in the body that could be harboring biofilms, bacterial or viral or fungal. I read somewhere that the majority of the really difficult to treat periodontal cases have staph and a fungal component, like a Candida component or something like that, and people will often have Aspergillus or something that's hanging out in the sinuses and other types of bacteria like MARCoNS or MRSA?

Those areas are all so close together. It just seems to me if you've got some kind of pathogen load in your sinuses or your mouth, it could be affecting each other.

Shivan: So, what can we do to help it? And do you have some conditions that you can just sort of run by us that you have evidence on that are attached to the bacteria in the mouth?

Kiran Krishnan: Sure. The major one is heart disease. There's a huge correlation between people who've had oral procedures done and people who have periodontal disease, and then there's significant increased risk for heart disease.

There are some ties between that and cancer, certain types of cancers in the body as well. Other inflammatory conditions, like diabetes for example, or autoimmune disease, the type of toxic bacteria in your mouth can act as an environmental trigger to stimulate the process for autoimmune disease. So, there's a lot of very common things...

Shivan: Diabetes?

Kiran Krishnan: Diabetes, yeah, because diabetes is an inflammatory condition. And bacterial toxins are a big driver of the initiation of insulin resistance. **So**, the American Diabetic Association studying this more than any other institute there is, they've shown that bacterial toxins, something called LPS, lipopolysaccharide, which actually comes both from your gut and can come from your mouth as well, once they enter your circulatory system, can move into your brain in your hypothalamus, and cause enough inflammation in that part of your brain that it actually disrupts insulin resistance centrally in the brain. So, your brain can no longer interpret your blood sugar signaling the way it's supposed to.

And that's outside of what happens to the pancreas in diabetes. **They call it central insulin resistance.** The command center for what happens with insulin and sugar in your blood is centered in your brain. That central command goes out, and then the pancreas goes out after that. So, inflammation, yeah, it's stuff from your mouth and stuff from your gut driving that.

Shivan: So, a friend of mine has a prolapse valve in his heart. And whenever he gets his teeth cleaned, they give them an antibiotic. Is this related, this relationship?

Kiran Krishnan: Sure, it can be. A lot of people with the prolapse valve in the gut, it's because of the leaking and the strep...

Shivan: ...in the heart.

Kiran Krishnan: ...in the heart, right. So that may be part of it because he might be susceptible to that. He might have had—I think it was rheumatic fever when he was younger that gave him that prolapse valve.

So, that is a direct example of bacteria in your mouth or upper respiratory tract that can actually get in and cause infections in other parts of the body.

Shivan: That's just like their standard operating procedure.

Kiran Krishnan: Mm-hmm... that's what they do. That's what they can do.

Shivan: Well, it's good that they do that because I would imagine that there are plenty of places in the world that they don't even pay attention to a prolapse valve or ask any heart questions if you're lucky enough to have a good dentist.

Kiran Krishnan: Absolutely, yeah. And dentists write a lot of prescription for antibiotics, right, almost more than some types of doctors because they do it prophylactically for many procedures. And so, it becomes important to note that when you take an antibiotic, although it can prevent certain complications that are relatively rare, what it does do is create a dysfunction in your gut microbiome; and then thereby your oral microbiome as well. So, it becomes really important to also utilize an effective probiotic when you're doing an antibiotic especially from a dentist. And, as it turns out, lots of dentists also recommend probiotics with the antibiotics. So, I'm glad they're starting to do that more and more.

Kiran Krishnan: So, one of the really interesting connections that the human microbiome various studies have come out with is that there is of course a gut-mouth axis as well. We know it can go this way. But what people didn't understand is it can go this way as well.

One of the ways that the gut can impact the mouth is through leaky gut. So, leaky gut typically will allow an endotoxin, that LPS that we talked about which is produced quite readily in the gut, allow that to leak through. And when it moves through your circulation, if it ends up in your gums, it can cause enough inflammation in your gums that it changes the microbial population in your gums. And there's certain microbes that do better when you have high levels of that leaky gut. Those microbes tend to be more pathogenic. They tend to be more disruptive and destructive to the gum tissue, and then eventually, to the bone in your teeth as well, the periodontal tissue.

So, there's this intimate connection between leakiness in the gut and the types of bacteria that proliferate in your mouth.

In fact, Crest launched a toothpaste recently, the end of last year, called Crest Detox. And the whole function of that toothpaste is they've got some component in there that neutralizes this LPS on the gums.

Shivan: Go Crest!

Kiran Krishnan: Right! They're being super progressive. So, we've had numerous meetings with them talking to them about the research we've been doing on stopping the LPS centrally in the gut itself. And that's something that has interest across the board from companies like that, how do you stop that LPS because it can get in the gums, and get in the skin and different parts of the body, and can disrupt the microbiome in all of those different areas.

Dr. Christine Schaffner: Our dental health is tied intimately to the rest of our body. So, we always ask people if they have a history of amalgam fillings, or if they still have amalgam fillings.

When we start working with patients that they have amalgams, that's one of the first things we do because we cannot detoxify a patient effectively when they still have mercury in their mouth. And they tend to actually be more reactive as well.

We look at root canals. Root canals, they're dead teeth. So, they can be an area of infection over time.

And then, sometimes, when the wisdom teeth are taken out, they don't properly heal, and cavitation can be formed. And that can be an area of necrotic bone which can have different infections.

And so, when you think about the mouth, the mouth actually—the teeth rather developed from the same embryological tissue as our brain. So, there's this connection.

And then, each tooth sits on an acupuncture meridian. So, if you have a chronic intestinal issue, I often think of the wisdom tooth cavitation site. So, because of that connection, we also think of the connection of the mouth to the vagus nerve. Just think of proximity, all the branches of the vagus nerve kind of come out from the brainstem. And then, a lot of the vagus nerve chain is in the neck. So, if you have biotoxins and infections in the mouth, that can be draining into the lymph and get taken up into the cranial nerves as well.

So, I just want to not overlook that because the mouth can affect the tonsils, it can affect the drainage in the neck. It's one of the hardest things we ask patients to do, but one of the most rewarding as well.

And you always just want to work with a really well-trained biological dentist. Don't ever get amalgams removed by somebody who still puts amalgams in your mouth.

And also, you have to really take that seriously because you don't want to get worse. People do get worse out there if we're not following the right steps or having the right support.

Dr. Schaffner: So, just again, if you've been sick for a long time and tried a lot of things, just take a little history of your mouth and see if there's something there to address. And work with biological dentist and a functional medicine or a naturopathic doctor to support you during that.

Jonathan Landsman: You mentioned meridians, absolutely. Like nerve system through our body—which of course conventional medicine knows about nerves, muscles and nerves. It's physically there—but the invisible pathways, if you will, that are through our whole body that connect us in so many ways, these energetic pathways are absolutely connected to our teeth, to distant parts of our body, from our lungs, our brain, our stomachs, our intestines, large and small intestines, kidney function, the list goes on and on.

So, there is that effect that if you've got an issue going on somewhere in your mouth with mercury-based silver fillings, root canal-treated tooth, infection somewhere, toxicities with metals going on in general in your mouth, that that is electrically, if you will, messing with the rest of your body.

We're all connected, right? It's not just a cliché. Our body is an intelligent body. We know full well in many places of our body when something's going wrong somewhere.

Shivan: So sir, I ask you what is up with root canals? What is the problem with them?

Jonathan Landsman: So, let's start from the beginning. First of all, again, conventionally speaking, root canal-treated teeth are no big deal. Ask any dentist, conventionally trained, their process is very simple. You go into an office, you have a cavity, it's bothering you, it may not. And it gets drilled and filled, and you're on your way.

But in particular, if it's bothering a person before going in, and the cavity is taken care of, and then the person leaves, and the pain still persists—and this is where millions of these procedures are being done without much thought past what I'm about to say—they're simply told, "You gotta get it treated."

You're going to save the tooth—which is again kind of like where you were coming from, right? If a person has teeth, about the only thing that they're told and the way they feel—and the two kind of go hand-in-hand—is keep your teeth. No matter what, it's really important to keep your teeth. And that's it! No more thinking.

So, usually, they're treated; a root canal-treated tooth is done. But the problem is that no one's told them from the beginning about what's going on with this. Every tooth is

like a breathing, living organism—breathing, circulating, an alive part of your body with lots of circulation that goes on.

So now, here it is, you're taking that tooth, you're drilling in, and you're killing the nerve. And you're essentially killing that tooth.

Jonathan Landsman: Now, the thing that I say often about this that people don't often hear is nowhere else in medicine are they looking at you anywhere in your body, noticing that you have something dead—literally dead in your body let's say in a surgical procedure—and then they just leave it in your body and stitch you back up and send you on your way and say, "No problem, don't worry."

That's exactly what millions of people are doing with a root canal-treated tooth. They're carrying around with them a dead body part.

And I'm not being overly dramatic because it's really important to start in that place. There's nothing woo-woo about this either. This is fact. And what happens then is you're looking at a dead part, and an analogy I use is like a shower stall, right? So, this dead tooth is a shower stall. No big deal on the first day that you have it done. But now imagine that shower stall in a very humid tropical environment, getting wet all the time. Now, what I'd like you to do is throw some breadcrumbs into the shower stall. I'd like you to take your dirty shoes, and I'd like you to stomp all over inside there as well. Keep the place very humid, keep it moist. Keep water in there just sort of sitting there all the time. And keep adding dirt. Throw in some bacteria. Throw in some viruses. Just mix it all up and let it sit in there over time.

It sounds very comical, but it's actually what's going on in people's mouths all the time—not brushing well enough, not keeping the mouth so clean, eating and drinking maybe not the best food, opportunistic infections (bacterial or viral), they're mixing in your mouth as well. And they're sitting and festering in and around this dead tooth.

The bacteria start to grow. And it's not just the bacteria, but it's the waste products that are being spit out from these bacteria as well that are really a serious issue.

And I want to pause for a second because **if anybody with a heart condition is listening to this**—and a lot of people may have the heart condition they're aware of, but they may not even know if they have a root canal-treated tooth or not, they're going to have to go to get evaluated. You had mentioned one of the best evaluations for the mouth is a cone beam, x-ray. It's a three-dimensional look at the mouth. It is the best look at the mouth. But even other x-rays can tell if something's going on.

A person's going to need to evaluate this because with this toxicity of a root canaltreated tooth, there is a very direct, conventional scientific, grounded evidence that this is directly connected to a heart problem. The bacteria, the waste products that they're emitting in the mouth are lodging in the circulation in and around the heart and doing a lot of damage. So, it's not just the heart, though. It's affecting a person's immune system on every level. So again, how long has the person had the tooth treated this way? What other kinds of toxicity issues does the person have? What's the strength of their immune system? This is what dictates whether a person is actually going to be experiencing a problem or not.

A 20-year old who's very athletic and healthy and eats fairly okay and is feeling great and has one root canal-treated tooth, maybe they appear fine. But that same 20-year old 20 years from now, not exercising as well, getting slightly depressed from a broken relationship, eating more poorly now, getting bit by a bug in the woods somewhere and now they've got some Lyme disease issues, their immune systems being taxed like crazy!

Now they're 40 or 45 or 50 years old, that root canal-treated tooth that's been pouring out toxicity all along is now sort of like the bathtub that's getting filled up with too much water.

Now, it's starting to spill over the edges. Now the person is having problems—hear issues, constant fatigue, skin issues, brain concentration problems, fatigue, the list goes on and on.

So again, it goes back to staying away from something that could potentially be giving you way too much toxicity pouring into your body all the time.

Dr. Sheila Dean: Well, I'm glad you said "my experience" because I am not a dentist. And so, I'm just going to share with you my own personal observation and what happened to me.

Several years ago, I had a tooth that several traditional dentists basically evaluated and said, "This tooth, this tooth is going to have to go." And when they said that, and then I got a second opinion, even a third opinion, they all concurred...

Shivan: Was it a root canal tooth?

Dr. Dean: Yes, that's exactly right. And basically, a root canal tooth, what that means is—well, a root canal is where the nerves under the tooth have all been basically removed. So, the tooth is basically dead. But the tooth was, I don't know, cracked or something, and it was showing up on an x-ray. And several dentists basically said, "This tooth has got to go."

Now, in the background, what was also happening was, for some reason, every time I would get up out of bed, I would notice that my right foot, I'd start sort of hobbling. And it was really kind of painful around the heel area. And I thought maybe I just had kind of bruised my bone or something. I did work out pretty heavily, and I was just sort of attributing it to that.

But it was getting to the point where it was just like, "Okay, this is really weird. It's just like on the right foot. It's not happening to the left. My shoes are comfortable." And I started to wonder about it.

But what ended up happening was I had this tooth extracted. And afterwards, they put me on some basic ibuprofen. And I noticed that I didn't have any more pain. But to be honest with you, I thought it was just the Ibuprofen. So, you take a little Ibuprofen, and your pain is gone pretty much everywhere in your body.

But you know, the Ibuprofen wears off after a day or two. And so, here I am, it's like 48 hours later after the procedure, and I'm like, "That's interesting. I just got out of bed, and I have no pain in my right foot." I still didn't think anything of it.

A week went by and I'm like, "Okay, this is really weird. I had a subclinical infection in my tooth"— which I forgot to mention that part. Yeah, I had a subclinical infection, not proud. They removed that subclinical infection.

Shivan: I don't even know what that is.

Dr. Dean: That just means an infection that's kind of like under the radar. So, it's not like this overt infection that you can easily detect. And so, they removed that. They cleaned it all up. And suddenly, I'm feeling amazing.

Now, when you think about that, it doesn't seem so off. But at the same time, that's pretty wild. And I mentioned this to some of the dentists. And none of them really disagreed with me, but they were all like, "Ehhh... it seems like a little bit of a stretch, but okay..." They found it kind of interesting. Well, suffice it to say, I've been fine ever since. But yeah, I will never forget.

And so, circling way back to what we discussed when we first started, it's all interconnected. The gut to the brain, the gut to the skin, the heart to the mouth, everything! Everything is... it's all interconnected. And it's hard because we're in a society where when we go to our medical professionals, sometimes, or most of the time, we're treated like we have these separate symptoms and separate silos. And they're not really looking at us as an integrated whole. And I think that if we can do more of that, and we can start at the root of it, which is the gut, we'll see so many other things, good things, clearing up and happening.

Dr. Christine Schaffner: So, when the wisdom teeth are taken out, for some people, that does not properly heal. So, a cavitation is an area of infected jawbone that hasn't healed properly.

Shivan: Would we be feeling it? Would we be like, "Oh, my jaw hurts!"

Dr. Schaffner: You know, some people do have jaw pain. And I always think of that. So, some people do have symptoms. But again, the symptoms would either be either vagus nerve symptoms, cervical lymph node congestion, some more distant symptoms.

Often, people who aren't healing—you're doing everything right, and you're not healing—we call them interference fields because they kind of are these

boulders, I say, in the middle of the road. We have to kind of address them, move them out of the way so the body can self-regulate and heal. So, cavitations, I think the picture that comes to mind, one of my mentors, *Dr. Louise Williams, she wrote a book Radical Medicine.* And in her book, she has pictures of cavitations and what they look like and everything...

Shivan: I've got the feeling that it was like a pocket of bacteria...

Dr. Schaffner: Yeah, it's a pocket. And the labs are getting more savvy. We're able to send this tissue to a lab...

Shivan:	What's the test for?
Dr. Schaffner:	It's called DNA Connexions.
Shivan:	Oh, yeah.

Dr. Schaffner: They actually do a lot of dental work. You can actually send in a floss around a root canal to see what kind of bacteria is there, or we can send samples of—once you are going through the surgical process, they can send that cavitation to the lab. It's amazing what shows up. I mean, there's all different types of bacteria, amoebas, different viruses. So, it's definitely a reservoir that can keep us sick if we don't address.

Jonathan Landsman: Alright, so dental amalgams or mercury-based silver fillings... it's interesting listening to you talk about how you described your experience. Hal Huggins was a pioneering biological dentist, your HH doctor. You're looking at over 5000 cases that he would see. People traveled from all over with all kinds of issues—body aches and pains at the very least, suffering for years (for some people listening to this, it may not sound like a big deal to have aches and pains for years and years. But for those people, it can drive your nearly crazy), autoimmune conditions, cancers, heart disease, you name it. All of these people came to his office, and he was the one spouting out all the time about how these issues in your mouth are causing your problem.

Now, I want to hesitate for a second because a lot of dentists who are conventionally trained—and I want to also add, even biological dentists—are not going to be the first ones to tell you, "Hey, you've got mercury-based silver fillings in your mouth. I hear you've got these other issues that you mentioned to me that you're dealing with." But in the dental office, they're not going to tell you directly, "You should get these fillings out so that you can feel better."

It's important for people to understand that because I know there's a lot of frustration that goes on out there with "Well, why aren't the dentists telling me about this?" It's really not their place. They're concerned about their license; people have to understand that—lawsuits and all of this. I don't think I have to explain much more about that. But it's just important to know because, when a person is learning like through these events and listening to this kind of information, that they arm themselves with the right information.

Jonathan Landsman: So, going back to mercury-based silver fillings, in dental school, they're teaching all the dentists this is no big deal. Half the filling is filled with neurotoxic mercury. I think most people at this point watching a program like this, they get it. It's not good to have in the mouth. But a lot of dentists, like what you were saying, are not really up to speed with how to get rid of this. Keep in mind, this is not woo-woo science. They're handling this mercury like nuclear waste before it goes into your mouth. They're handling it like nuclear waste when it's coming out of your mouth. They don't just throw it away. They really got to take care of it. That's how poisonous this is.

And somehow, magically, in the middle, these fillings are supposed to be fine inside your mouth. Now, they're not. And if you go to a video that is very popular through the internet, a smoking tooth—which was done by a friend of mine and a colleague of his, Dr. David Kennedy—they took a mercury-based silver filling that was extracted out of a mouth. Twenty-five years old, just sitting around, he took a brush—it was actually not a brush, an eraser-type thing—and they rubbed it. And under special lighting conditions, they could see that the mercury vapors were outgassing out of this tooth.

So, when a dentist is saying, "Oh, I don't think this is a problem," or maybe somebody's friend or family, "Why are you making such a big deal about this?" ... It's very important to understand that, one, these teeth are really toxic. They're having an effect on your breath, the way your mouth feels in the morning. This has an effect on your energy level. If you're becoming mercury toxic in your body, you're suffering with chronic fatigue, brain fog, and an inability to concentrate—the list goes on and on.

Autoimmune conditions, clearly, when the mercury is outgassing, it is very close to the brain, so it's easy to understand for those people who are concerned about dementia. But also mixing with saliva and swallowing that into the rest of your digestive system, getting into your stomach, into your blood, into your lymphatics... this is a serious thing.

Shivan: Are people actually still using silver-mercury amalgams out in the world? I wouldn't go to a dentist that does that right now. Is that still happening?

Jonathan Landsman: A hundred percent! Again, it's important to realize that, when people take this kind of information that they're learning here with you, and they take it out into the "real world," there are a lot of dentists will say that they're mercury-safe or whatever. There are a lot of dentists that are still dealing with mercury fillings; certainly plenty of conventional dentists are putting them into the mouths of people.

Understand that most conventional dental medical schools that are the only ones that these people can go to to become a dentist, the vast majority of them are teaching their students this is what you do to put a filling in. And they are using mercury.

And I will take it a step further. I'm not going to pretend that this is 100% of the time, but I've heard it enough that it's worth mentioning for people to realize what they're

dealing with. A lot of these dental students don't even realize what they're being taught. They're just being taught there's this metal filling, this is how you put it in, and everything's okay.

Kiran Krishnan: So, one of the first things you can do, which doesn't seem intuitive at all, to help your oral microbiome is to fix your gut microbiome. The right probiotic and the right prebiotic can fix the oral microbiome.

We're doing a study on that actually. We're about halfway through that study which should be completed sometime by the end of the summer. We've got three periodontal offices in the southeast of the country that are doing the study. So, it's like a 60- to 70-patient study. And we're putting them on a probiotic/prebiotic mix. And we're measuring changes in their bleeding on the gums when you probe at it. So, that's the way dentist measure your degree of gingivitis—they do a probe, and they look at bleeding on probing. So, we're seeing whether or not we can change that response in people's gums. And then, we're also swabbing the oral cavity to check the microbiome, to see how much change we can make with the microbiome.

Shivan: Wow! That's cool.

Kiran Krishnan: Yeah! We can fix the mouth, we can fix the skin, we can fix so many different things by fixing the gut. That's a central command center.

You probably don't need to use those alcohol-based mouthwashes. Now we're starting to see less—people are making more alcohol-free mouthwash.

Shivan: Yeah, I saw that. Listerine does one.

Kiran Krishnan: Exactly... which as it turns out will be better eventually, not only for the tissue, but also the good bacteria in the mouth. There are good bacteria there as well. It's not all bad obviously.

And so, what you want to do is kind of control growth to some degree, and not use a really sanitizing alcohol-based mouthwash in the mouth.

And then, of course, good hygiene practices, like you said, good eating habits, not eating something sugary before bed, all those common things. Those all still make sense in the view of what goes on in the oral microbiome.

But the part that's really new is that your gut can actually affect it. Now, here's a piece of evidence that's really interesting. There was a study, I think it was published in 2014. It showed that 94% of Americans have some degree of gingivitis in their mouth.

Shivan: Wow!

Kiran Krishnan: Ninety-four percent! And that's really alarming when you think about us being a first world country with really good oral hygiene. People go see dentists regularly, we brush our teeth, we floss. We do all these things. Why would 94% of Americans have some degree of gingivitis? So, **it must be caused by**

something else, something that we're not looking at. And it's probably the same thing that's causing our tremendous increase in prevalence of obesity, skin disorders, mood disorders, autism, allergies. All of these other things, that's the gut.

Shivan: There you have it! Okay, marching orders, we've got them. And we'll look forward to the results of that research.

Kiran Krishnan: So, I mix it up. One of the things I like to do is, actually, I use a different toothpaste every week. I have four or five that I found that I like. Some of them are the charcoal-based ones.

Shivan:	Oh, yeah that's cool stuff.
Kiran Krishnan: as well?	which is cool because I grew up in India. I think you did

Shivan: No, I grew up here but my dad is from India.

Kiran Krishnan: Okay. And I remember, in India, people brushed their teeth with charcoal, with actual charcoal. And it always resonated with me. It looks weird! You're making your mouth all black, and then you rinse it out and it's clean. And so it's an interesting concept.

So, **I have about four or five toothpastes that I like, including Rachel's Biocidin** version of it. And I kind of switch it up. Each week, I do something different.

Part of the reason for that is, you know, you don't want the microbes getting used to one thing. You get adaptations and so on. So you kind of change it up a little bit. And it gives you a little bit of variety.

Shivan: That's a good idea. It's like a variety of food for your microbiome.

Kiran Krishnan: It is, yeah. Absolutely!

Shivan: I also remember when I did go to India when I was little, that people would be chewing on the neem tree sticks, which is terrible tasting. But that is an herbal...

Kiran Krishnan: Anti-inflammatory, yeah.

Shivan: ...anti-inflammatory.

Kiran Krishnan: And then, they actually use it to kind of floss in a way too. As you chew, the sticks, it becomes sharper at the edge. It's kind of like brushing the teeth. **But it reduces inflammation in the gums itself**—which is another canary in the coal mine that 94% of Americans with some sort of gingivitis, some degree of gingivitis. That tells us that 94% of Americans have severe inflammation in their body which is causing that inflammation in the gums. So, it's again that canary in the coal mine telling us something's wrong.

Shivan: Okay, some action steps, fix your gut, rotate your toothpaste, go easy on the alcohol in the mouthwash, and floss. Have good hygiene. And...

Sabrina Zielinski (Mama Z): And this is crazy. Before I knew I was allergic to formaldehyde...

Shivan: You're allergic to formaldehyde? That's shocking...

Dr. Eric Zielinski (Dr. Z): The only one in the world!

Mama Z: Oh my gosh, yes. But what happened was, my girlfriend, she's a natural nail expert. And she had certain products that she would—she could tell right away after doing your nails if you had formaldehyde allergies. And for years, I could not figure out why my mouth was peeling. I go to the dentist, they'd say, "Well, you don't look like you have chewed tobacco. You haven't chewed tobacco, right?" I'm like, "Do I look like I have?" And they're like, "Well no... but I've never seen anybody's mouth peel like this." They couldn't figure it out.

My girlfriend was like, "You know, you have a severe formaldehyde allergy." I said, "How do you know?" She's like, "This is a very natural polish. And it does have some of the formaldehyde in it still. And there is a formaldehyde-free version, but I can't even use that on your nails because your nails are almost gone." And she said, "Do you know that?" And I said, "I had no clue."

So, I started doing research. And then, of course, aspartame, derivatives of formaldehyde in there. And so, as soon as I cut out the regular toothpaste, my mouth stopped peeling. But I would pull out just pieces every morning after I brush my teeth. And at night, it was the weirdest thing. Sure enough, huge! So, it matters what we use.

From the nail polish?

Mama Z: That was just an indication.

Shivan: Got it!

Mama Z: But other places...

Dr. Z: Like the toothpaste...

Mama Z: The toothpaste has those ingredients. So, when you think about just those little things, we all have a toxic threshold. And what we do matters. What we use in the shower matters. What we use out of the shower matters. So, if we're doing what we can to be as detoxified as we possibly can,

then we're going to be not hitting that threshold every single day and being chronically ill.

Mama Z: You mentioned some of the low hanging fruit that we want to do in our house. And one of the biggest low hanging fruit is get rid of all of your non-natural plugins air fresheners, hand sanitizers, all of those things because either they contain pesticides or harmful chemicals, and they are interrupting what's going on within our body because that smell is so powerful.

And for people who then detox off of that and have that without in their life, you'll find you're much more sensitive. You start getting back your sense of smell literally where you were kind of—you didn't even notice in the bathroom that you were pshhh, pshhh at a restaurant getting bombarded with these unnatural air fresheners, but you will become very aware of that. And then, this becomes so much more important.

Dr. Z: I would argue that that is the number one cause of gut issues today, the number one link.

Shivan: The toxins?

Dr. Z: Oh yeah. You see, when you look at the epidemiological data, when you see from early 1940s through today the influx of everything from Dial soap—which introduced like a triclosan-based product or antibacterial (that was the advent of antibacterial stuff)—the mid-'40s Dial soap, and then you start seeing all the scented candles and the scented soaps and lotions, every time you see a rise in those scented, synthetic fragrances, you see a spike in the cases of autoimmunity. And there's a direct connection. Gut issues, autoimmunity and cancer, they're all interlinked. And now dementia is on the rise, Alzheimer's.

We are dealing with things that our ancestors never dealt with. And our body was designed by God to interact with these natural smells. We have neurotransmitters. We have lock and key mechanisms. We have receptors in our body that will interact with these chemicals. But when you introduce a fake version of it, the body doesn't know what to do with it.

And so, when you look at chronic inflammation, nothing can cause an inflammatory response like chronic stress to the brain because your brain feels there's a poison in the area through smell. It's constant. And it's micro-trauma. It's micro-stress.

And so, yes, we can deal with the arguments with the spouse and the issues with your boss at work and the McDonald's fast food lifestyle. Those are macrostresses. But when you're chronically breathing in micro-doses of poison, what does that do to the body? And what does that do to the brain? And the brain's like constantly [warning alarm]. But it's a really low [warning alarm]. The next thing you know, people start to develop gut issues because that chronic inflammation just tears your intestinal lining.

And then, we see just rises of SIBO, IBS and other concerns, Crohn's; just a direct correlation.

et's talk about mold.

Dr. Ami Kapadia: Sounds good.

Shivan: And we're not talking about like blue cheese mold, are we?

Dr. Kapadia: Right! So, we're not talking about food molds really. We're talking more about environmental exposures and inhalation of molds from the environment.

Shivan: So, one of the biggest, shocking things that I have heard is that you could be exposed to mold one time in your life—some people—and 40, 50, 60 or 10 years later, you could still be experiencing the implications of that one exposure. And you might not have even noticed that that happened initially. Is that true?

Dr. Kapadia: Well, it's probably more than just like a one-time exposure. If someone was living somewhere for a while, and that was that one time, I could see how that potentially could affect them for years later. It's not usually just a one-time incident where they were in a location overnight in a hotel...

Shivan: Good! That's good news.

Dr. Kapadia: I would say with a caveat that there are some people that can be affected to that extent where if they are sensitive to molds in the environment, even one exposure can affect their immune system. But I would say the majority of the people we see either have current exposure in their home or work or a past prolonged exposure where they were living somewhere that had water damage or working somewhere that had water damage.

Shivan: What are some signs that you might have had mold exposure.

Dr. Kapadia: Yeah! So this is the tricky part. It's one of those things where it can affect so many organ systems that I almost think about it as someone who's tried all sorts of things for their health, they have symptoms in multiple body systems—so cognitive issues, digestive issues, skin issues, different organ systems involved, and they're just not getting better with their current treatment plan, they're seeing a really good integrative medicine doctor or naturopathic doctor, and they're just sort of hitting roadblock after roadblock.

Sinus symptoms, respiratory symptoms, all of those things can be part of symptoms that people got with mold exposure.

So, it's not like there's one particular symptom you would look for. It's more of like polysymptomatic patient that's just not getting better who has symptoms in various parts of their body is who I think about for mold.

We think anywhere between probably 18% and 25% of the population is susceptible. That's from the work of Dr. Donald Dennis and Dr. Shoemaker. And so not everyone is susceptible.

So, for a majority of the population, it may not be an issue as far as causing significant health problems, whereas for a minority of people, it can be enough to keep things going and causing ongoing issues.

Shivan: But 25% is a lot!

Dr. Kapadia: So, 25% of the population, that's still a significant percentage of people that are potentially going to get affected by occasional, ongoing exposure at work, like you were saying, an hour four times a week for 20 years. It doesn't seem like a lot. But for the person who's susceptible, it can affect their health.

Shivan: And so, what makes someone susceptible? Is that a genetic thing? Do I have some SNP?

Dr. Kapadia: Yeah, that's a good question. So **Dr. Ritchie Shoemaker's** work, he does believe there's a genetic susceptibility—not for everyone, but he thinks, often, that's the case.

Dr. Kapadia: There are other doctors that have looked at this and we're also wondering if there could be some acquired susceptibilities where just having the genetics isn't enough to make you get sick from mold, but it's sort of the genetics plus the environmental hits that you've had over your lifetime, whether it's stress, a new job, another exposure, Lyme disease, something like that that puts your body over the edge. And then, you can become symptomatic whereas you were fine for 15 years before then.

Shivan: So, talk to me about the testing.

Dr. Kapadia: Right. So the testing is tricky. We do say you have to use your clinical judgment. It's a clinical diagnosis, but there are tests that can be helpful.

So, there's a couple of different tests that we currently use. One of them is a urine mycotoxin test that can be done by Realtime Labs or Great Plains Lab. That looks at several different mycotoxins that your body can be excreting from exposure.

The other labs that we're currently using, an IgG antibody test from Alletess Labs that looks at your body's IgG antibody production for various molds. And we also think that can be helpful as far as showing potential exposure that's in the last several months.

There's also Dr. Shoemaker's labs which can be tricky to do and to interpret, but we use those as well. There's a couple of inflammatory markers—C4A, TGF

Beta-1, MMP9. They have complicated names, complicated blood draws, complicated interpretations.

So, we use all of those together to try to get a picture of how if the patient potentially has exposure along with their clinical history. We also use something called the Visual Contrast Sensitivity Test that Dr. Shoemaker taught us about. It's a simple \$15 test that patients can do on their own on his website, SurvivingMold.com. It tests for your ability to discern different contrasts of color and of different shades of gray. And if you've had biotoxin exposure like mold exposure, it can affect your ability to tell contrast.

So that's another test we use just to get another idea of if you potentially have exposure.

Shivan Sarna: So we have these tests that we can test our bodies, and then you said that there are some mold testing companies and kits that you can do for your own house. And I know that you have some that you like more than others.

Dr. Kapadia: Yeah.

Shivan: So, tell me about those.

Dr. Kapadia: Sure! I really encourage people to use an environmental consultant. I think it gets really tricky to do this on your own. You can try, but the results are confusing to interpret. So you want someone who has been looking at these tests for a long time. It looks at a lot of them.

The two tests that are mostly used, one is the ERMI which is the Environmental Relative Moldiness Index. It's basically a PCR analysis of a dust sample. So you swab various places in your home. Ideally, you clean your house completely—like above the lamp shades and the fan blades and all of those things. A month or so later, you go and take a dust swab from those areas of the house where dust accumulates.

Some people also use a furnace filter sample. So those are kind of the two options of what you can use as far as getting a PCR analysis.

Then the lab will look at it and tell you what species of molds they're finding and the concentration. So that's one way to look at it.

The other one is called an EMMA Test that Realtime Labs does. It's Environmental Mold and Mycotoxin Analysis. So again, it's looking at the strains of mold that are present in a PCR. It's also looking at the mycotoxins that are present.

Dr. Adam Miller: Gone are the days when we're debating whether or not periodontal disease influences your risk for heart disease. Gone are the days when we're debating whether or not periodontal disease influences your rate for miscarriage in the first term of a pregnancy. And add to this discussion now the acceptance that

periodontal disease is influencing your risk for dementia which is considered type III diabetes or the third most common cause of death among women in America now.

So, we need more research. We need more people like Rachel and others. The University of Michigan I think is doing some decent work. But there's no question that there's a huge influence. And we need to understand what to do about it.

Shivan: One is how would one find a good biological dentist? Is there a directory you like to refer people to?

Jonathan Landsman: Yeah, again, there's no guarantee and everybody's different, right? So, a big thing I like to preface this with is, bottom line is, find someone you like. You don't have to have a medical degree. It's common sense. When you're speaking to someone, if they're not okay with answering your questions, and they're short with you and you don't like their staff, don't go to that dentist.

But to answer your question really quick, I do tend to say, look, check out the International Academy of Oral Medicine and Toxicology, IAOMT.org. And they have a directory there. Their membership, if you will, is like 700 or 800 dentists all around the world, but mostly in the United States.

And look, if you have to travel, do it. I mean, it was over an hour for me to travel. Some people travel halfway around the world to get to a dentist that they feel safe and comfortable with that's going to do this kind of work because, again, it is life-changing work. There is no exaggeration to what I'm saying.

When someone is constantly dealing with the body aches that I was telling you about, the constant brain fog where they can't concentrate or remember things, and it's getting in the way of everything in their life, they're dealing with cancerous tumors in their body, or serious heart failure issues, cleaning up these issues in the mouth are a very big deal. And it's the first step towards getting away from toxicity—these toxicity issues that are constantly stressing out the rest of your digestive system, the rest of your entire body, your immune system. And it's preventing a lot of people from feeling a lot better.

And this is even in spite of the fact that—and I know a lot of people that have said this to me, who have eaten the best food, taken the best supplements, spiritual healers. I mean, you name it. Literally down the list, all the things that they've done to try so hard—meditation, exercise—to feel better. And the one thing they were overlooking until they were finally pushed to that point, check out your mouth and fix those issues.

None of those things helped them. I mean perhaps you could say it helped them a little bit, but they weren't over-the-edge recovering. And when they fixed these issues in their mouth, it really made a huge difference.

So clearly, mercury-based silver fillings should not be in the mouth. But the bottom line is, make sure that you take care of yourself to get yourself into the best health you can

before you get them extracted. And make sure you work with someone that's a well-trained biological dentist... so important.

Jonathan Landsman: And I only highlight this stuff because it's really important as people take this information and learning here that they understand not to get frustrated, not to get angry at not getting what you want from someone who's conventionally trained. What else do you expect? It would be like going to an auto mechanic and saying, "What's the matter with these people? Why aren't they helping me with my heart condition and my stage four cancer?" and getting all frustrated and angry at them. That would be crazy. Same thing with these conventionally trained people.

"Just forget it" is my message. Don't get sucked into that darkness and that negativity. Look for a well-trained biological dentist. Do your own research. And do what makes the most sense to you. That's what I hope people take away from this, at least about these fillings that we're talking about here today.

Episode 10: You've Never Seen This Before: The future of gut health is now.

Shivan: Hi! What is ozone? How do we use it to help us?

Dr. Ilana Gurevich: So, ozone is a lot of things. The one thing that you brought up is it is the ozone layer in the sky that keeps a lot of our environment or our climate in check. That is not the ozone we're using.

Ozone is naturally derived. You know when you're in a lightning storm, you have that lightning smell? That's ozone that you're smelling.

Ozone has been used. It was first created by Tesla in 1920-something—or maybe 1918. He was the first person that held a patent on it. And at that point, it was being used for sanitation within our water supplies. Ozone is ubiquitously used for sanitation of fruits and vegetables, for water sanitation. It makes denim change colors. It is an amazingly, amazingly powerful, slightly toxic gas. And it's toxic only to the lungs.

So, if you breathe in an excessive amount of ozone, you will cough, you will have tightness in the chest. If you're an asthmatic, you'll get an asthma attack. If you have COPD, it's like the worst thing you can breathe in.

However, it is not toxic anywhere else in the body. Medically, we use it a couple of different ways. The most common way we use it is something called major ortho hemolytic blood therapy.

Shivan: Whoa! Say it more slowly.

Dr. Gurevich: Major ortho hemolytic blood therapy. It's called blood ozone.

So what happens—it's a crazy, crazy technique, but it's used for chronic infections and mitochondrial disorders. What happens is you take 200-ish cc of saline. You drain 200-ish cc of blood into that saline. And then, you inject the 200 cc of ozone. You mix that up with a little bit of heparin to act as an anticoagulant, and you put it back into the body because what gets put back in is something called an ozonide.

An ozonide basically is a free radical electron that's used to a) kill pathogens, and b) turn on the mitochondria because the electron transport chain of the mitochondria—which is the battery of your entire body, and you've got billions of them—the way that it works is this electron flows from reaction to reaction, so that your body can turn on and make more power for itself.

So, that's what ozone is.
Dr. Gurevich: I don't use it as much with my SIBO patients mainly because everything about administering ozone rectally is backwards. The large intestine is supposed to contract and push down. And here I am taking 750 cc—that's about this much gas—and I'm putting it up into the large bowel and small bowel.

So, what happens is, when you administer that gas, the large intestine stretches. When the large intestine stretches, that's its sign to have a bowel movement. So oftentimes, ozone will make you have a bowel movement or have diarrhea.

Also, I know as a fact that all of that ozone is going up into the small bowel and probably even the stomach. So, what happens is basically anybody who has SIBO, their symptoms feel way worse because they bloat because there's 750 cc of gas that shouldn't be in there.

And so, generally, for my IBD people who I think are a lot sicker and need a lot crazier interventions, especially the ones that are failing all their drug therapies, I feel kind of okay. I kind of warn them that "you're going to feel worse."

But they've studied what ozone does in the intestine in particular. It was a mouse study; it wasn't a human study because no human would go under this. But at the 6-hour mark, what ozone seems to do in the inflammatory bowel disease mouse intestine is it seems to act as more inflammatory.

And so, it seems to find all of those cells that are irritated and damaged and inflamed, and it irritates them and damage them even more.

And so, the body then sees those cells really quickly and sloughs it off.

Within 72 hours, what happens is all of those free radicals that are turning on the mitochondria turn the mitochondria way up in the intestine. And within 72 hours, you have a brand-new set of completely anti-inflammatory cells.

Shivan:

Wow!

Dr. Gurevich: It's phenomenal. And I have tracked my patients. And I've been doing this now for I think six years. I have tracked their inflammatory markers, mainly a calprotectin which is a stool marker. And I have seen them plummet down with repeated therapy.

And then, when we get them back out of their flare, they don't have to continue doing it because we've taken care of that inflammatory.

I mean, it's not the only thing that I do, but it is my ace in the hole when I don't know what else to do.

Dr. Anne Hill: Ozone follows really naturally with neural therapy because, oftentimes, you're putting ozone or injecting ozone into areas right after you put the procaine in.

The ozone is great. It's an anti-infective, antifungal. It helps your immune system to function better. It helps the whole mitochondrial, basically, for all the energy to go to the cells to function better.

So, it really is an amazing medicine when it works.

It's kind of one of those things. We still don't know what all of the ways that we can use it are. So, sometimes, I'm kind of experimenting with it a little bit and I'm saying, "Well, if I think there's some kind of internal infection or something," I'll say, "Well, why don't we do a little bit of neural therapy. But then let's put some ozone in it too and see if that helps."

Dr. Hill: I certainly have had a lot of really interesting cases that have made me kind of rethink infections. We tend to think that, if someone has an infection, they're going to have a fever. And the area's going to turn red. And then, they're going to have to get on antibiotics.

But what I realized is that the body is really amazing at hiding infections and blocking them off, so that it's not going to spread, and so that it's trying to protect itself.

So, I've had a lot of interesting cases where people have had surgeries, like knee replacement surgery or ACL surgery where they have had different kinds of multiple surgeries. There were problems with the area, but it never turned red. And nobody ever kind of suspected that there was an infection there.

And then, when we've put in procaine and ozone—a lot of times, I'm just doing the scars. And sometimes, I'll put in ozone. And then, what I see is that we actually have seen where a big, red spot will actually come out of the scar. And then, sometimes, I then actually had to put them on antibiotics because we realized like, "Oh, my gosh! We just pushed this infection out of the body."

But that to me was pretty amazing. And that just made me think like I think we miss a lot of things because we're not looking for the smaller signs of what can be happening in the body.

Shivan: Okay. So, let's talk about—so ozone, can it be done at home?

Dr. Ilana Gurevich: Yeah, you can absolutely buy an ozonator. You can absolutely buy a medical ozone machine. I think there are a couple of companies that I have a lot of trust for.

And when you're looking at a medical grade ozone machine, it needs to get hooked up to an oxygen tank because you need to make sure it's pure oxygen that you're putting in there. There are ozone machines—it's used a lot in the restaurant industry and in the hotel industry to clean up odors and smells and mold and stuff like that, but that's using room air, and that's not safe for medical use. But there's a couple of really good companies that make really good quality ozone machines. And if you have the money, the cheapest one I think is like US \$1700. And then, you can go to \$5000 or \$10,000. But if you're going to use it, that's actually not that bad.

Dr. Gurevich: One of the things we talked about last time is neural therapy. We had a conversation about this injection-based therapy. The theory of neural therapy is when the nervous system is in your spine it's the CNS, the central nervous system. That nervous system leaves the spine, so it goes out of the spinous process. At that point it's the peripheral nervous system or the autonomic nervous system, same thing. That nervous system travels from the spine through the organs to the skin. Gets smaller and smaller until it goes from the skin back through the organs, back to the spine, back to the CNS to give information.

It's like when you have abdominal pain and you put a hot pack on your belly, physiologically what's happening is those nerves that are innervating the stomach go to the skin. The skin gets the impression there's something hot, and heat vasodilates. It sends the central nervous system a message to make more space because it's vasodilating. That's why heat helps your stomach not hurt.

Those same nerves accumulate or congregate in the mouth. They also are scars. When you have any kind of surgery or any kind of trauma there's a cut to the skin, which means that the peripheral nerves, the cutaneous nerves are cut. That information, that circle that should happen is not happening. The central nervous system is missing information. When you have a nerve that goes through organs and then also touched the periphery if there's an injury that scar could be causing what's called an interference field, which means the body doesn't see that there's an injury so it never properly heals, causing chronic pain. This can happen in the mouth.

Shivan: First of all, that whole explanation of chronic pain is so powerful. That makes a lot of sense.

Dr. Gurevich: injecting the scar.	So, the most important parts about neurotherapy is
Shivan:	So, do you put it in the abdomen sometimes?
Dr. Gurevich:	Yes.

Shivan: If somebody has an adhesion?

Dr. Gurevich: Oh yes. Adhesions are funny. **Adhesions from scars** – we know scars cause adhesions. If everything is working normally your fascia, your organs are slippery. It's like waxed paper with butter in the middle. You have a surgery. All of a sudden it reheals and these can't move. Any abdominal surgeries, but tummy tucks are the worst because there's a scar around your

entire abdomen. First of all, if we're talking about acupuncture, that is literally every single meridian.

Tummy tucks are the worst. What happens is they heal crooked because tissue doesn't heal in straight lines. That's called an adhesion. If you want to talk about one of the issues that cause SIBO, adhesions mean the migrating motor complex can't work. If the migrating motor complex can't work, you've got the perfect little incubation area for bacteria. Bacteria starts there and then moves to other places.

Dr. Anne Hill: So, a lot of times with inflammation, the nerves can kind of get stuck in sort of an on position where they keep giving information to the brain that says, "I'm in pain... I'm in pain... I'm in pain..." And so, with neural therapy, what we're doing is we're doing small subcutaneous injections of procaine. Basically, it's novocain. So, most people have had novocain in their mouths. But procaine is a little bit of a lower percentage for the kind of dosing that we're doing. So, it doesn't feel like—you know when you go to the dentist and you feel like your mouth is out here? You don't feel like that usually with this therapy.

So, when we inject areas of the body or scars, what that does is it helps those nerves to kind of gently reset, so that the inflammation can go away, and so that they can actually function better. And this helps with breaking up adhesions in tissue. And it also helps when they do therapies over organs—like the heart or the small intestine or the large intestine. It can actually help those organs function better.

Shivan: Would you put them in like trigger points and things like that?

Dr. Hill: Yeah, sometimes we use them for trigger points. We do lots of interesting scar therapies. We do a lot of tonsil injections where people have had their tonsils removed—it sounds worse than it actually is. But a lot of times, the lymph is getting stuck up on here. And when you can help break open that scar tissue, then the lymph can drain better in the brain. We see a lot of people here who have a lot of brain fog and Lyme disease and things, mold illness where their brain is not functioning. So that actually helps everything move down easily.

Sometimes, we'll do neural therapy for headaches. Really, it's very much like acupuncture because we're putting the procaine—basically, they're all acupuncture points around the head.

We'll also do neural therapy to the kidneys and the adrenal glands. And that's really nice for just kind of helping people who have been really stressed out or people whose kidneys aren't functioning well.

And one of my favorites that we do as well is something called the Frankenhauser injection—which of course, so many cool things are named after old, dead doctors. That's one of them. And this is a pelvic injection that we do that is basically trying to get a large amount of procaine behind the space behind the uterus. And this is a great way to help with adhesions in the pelvic area.

Also, I do this one a lot for chronic hip pain. And I'll also consider it for chronic abdominal issues like SIBO and parasite infections and things like that.

Shivan: Whoa! I wonder if it would help with visceral hypersensitivity.

Dr. Hill: It's certainly worth a shot.

Shivan: FMT, tell everybody what it is, if you would please, and what's the deal, man? What's the deal?

Dr. Jason Hawrelak: FMT is fecal microbial transplants, and it is, as the name suggests, taking poo from someone else, and taking it in yourself as a way of reseeding. And this does do that. You can certainly re-seed using someone else's feces.

There is a way of doing it, it's just more complex than just taking a probiotic capsule. And there's a couple of different ways in research circles, and not to say that—it's unclear at this point which way is superior.

There are some people who will send a scope down your stomach, and secrete essentially dilute, watered down feces into your small bowel. And there will be others who do it by colonoscopy where it goes up the other end and squirt feces in your colon.

And that's the process. So, there are still debates about which way is most effective. Most research to date has looked at Clostridium difficile which is a very horrible gut infection to actually get. It can be life-threatening that commonly occurs after antibiotic usage, particularly sorts of antibiotics, and even more so if you happen to be in a hospital and taking antibiotics there. Clostridium difficile everywhere in a hospital setting, sadly. Usually, it's not a problem if your gut ecosystem was intact. But as soon as it's not, it becomes a problem. It can grow into this space that becomes available.

Yes, the most research on FMT has looked there. But there's a burgeoning area of research looking at FMTs for other conditions. And this, I think, is quite exciting as well because there's research looking at metabolic syndrome.

For example, people that had blood sugar issues, weight issues, essentially took some poo from healthy, metabolic healthy people, one application down the upper tube, and their blood sugar regulation improved dramatically. No change in diet, no change in lifestyle, 50 more species were present from a fecal transplant than what there were before.

So we've got the capacity to decrease diversity pretty strongly, and low diversity is one of the biggest buzz words in the microbiome world because it seems to be a risk factor for a whole range of chronic ill health than conditions that we see in western countries, and our diversity scores are generally very poor as well because we've often had C-section births, and we are formula-fed, and we took lots of antibiotics as a kid, let alone

one or two or three course a year for our entire adult life, and we're eating a western diet that's so low in fiber that we don't have much diversity left.

But we know that there are people with obesity, or type 2 diabetes have got less diversity than even typical western population.

Shivan: So, people who are losing weight and people who are gaining weight, can they both benefit from a supplement or FMT of a probiotic?

Dr. Hawrelak: There's been some very good preliminary research using probiotics to help with obesity and type 2 diabetes and metabolic syndrome and prebiotics as well. There's some great research using fructooligosaccharides and inulin as a tool that actually help improve blood sugar control quite dramatically.

And some probiotics, including the bifidobacterium lactis HN019 that I spoke about before, has got some research helping with obesity as well and decreasing systemic body wide inflammatory markers.

So, there's a building area of research using probiotics and prebiotics for those conditions.

As far as where no one has looked at, people that lose weight too easily. It's such a small proportion of the population that I don't think people bothered looking at it to date—but that might change. Certainly, there's a lot of effort going into the obesity of side of things.

And it wouldn't surprise me in a few years' time if FMT would be a more widely offered treatment approach for obesity, metabolic syndrome and type 2 diabetes given how impressive the early results have been, and also given, I suppose, that it doesn't seem to require lifestyle or dietary changes to work in the short-term.

Now, that's the issue because if you keep eating that same western diet, it was lovely and beautiful right after the FMT, but it's going to deteriorate rapidly and become the same one that it was before because it's really very much dependent on what we're eating as to what species thrive and which ones don't.

So, you often see things shift pretty dramatically after FMT depending on people's diets. It's been shifting this very much in a very beneficial way by choosing the right foods and the right prebiotics, et cetera. But then you see patients who had a beautifully resistant post-FMT go down the gutter because they're eating a really restricted diet which is has got so many healthy fiber-rich, polyphenol-rich, prebiotic-rich foods.

Amy Hollenkamp: I had researched, and I really like this clinic based outside of London called Taymount Clinic. And they had opened up an affiliate branch in the Bahamas. So, I went there a year ago and got FMT.

I kind of went, and I was still having a lot of gut pain, bloating-like symptoms, but not really having a lot of—what's the word? —visible bloating. But I've definitely had a lot

of symptoms. And I just felt like my digestive tract wasn't working properly. When I got my stool test before I went, I had a lot of pathogens and things going on that were not right.

So, I did two weeks of treatment there. Each day, they would put an implant in. I did five the first week, every day of the week. And then, I did another week, five every day of the week again. And it's been about a year, and my symptoms have greatly improved from that.

Shivan: Wow! So what are some of the symptoms that have gotten better because of that?

Amy Hollenkamp: I don't really have much gut pain anymore. I can feel my digestive system working a lot better, a lot more gurgles, a lot more—I don't know. When your digestive system is working right, you can feel it. Everything is kind of flowing, you know? I'm a lot more regular. The pain has decreased almost to where it's not existent.

Shivan: Do you feel more vital? Do you feel more healthy?

Amy Hollenkamp: I do feel more vital. I feel more energetic. I also had some hormone things going on. And those have definitely improved since the FMT.

It was interesting. In my lab work before the FMT, I was having some liver issues. I had high liver enzymes which is kind of associated with liver dysfunction. And those went back to normal levels right after my FMT.

My white blood cell count went to normal. It was low before my FMT.

So, I had positive tests even after. I think I got those tests like a month and a half, two months after I got my FMT. So I've had some even clinical improvements when you look at some of the lab work. But I definitely feel more vital since doing it for sure.

Amy Hollenkamp: Yeah, I definitely think ruling out as much as you can before you decide that the gut is the main problem and you go to the lengths that I went to, like going to FMT. It's probably a good idea to rule out molds, yeasts, Lyme, things like that are other infections that might need to be addressed. Even SIBO needs to really be addressed before you get FMT.

So, even understanding your problem before you go is probably your best bet.

Dr. Mark Pimentel: But what we do know is that fecal transplant, and we've even looked at some of these data in systematic reviews, fecal transplant, five trails, and two of the trials show placebo works better than fecal transplant. That tells you that it's not about fecal transplant. It's not that placebo is better than fecal transplant. It's that, potentially, fecal transplant makes people worse.

So, be careful! And I advise my patients no fecal transplants for IBS or SIBO right now because we really don't know.

Larry Wurn: So, first perhaps is to get a good concept of what adhesions are and why they form and how they form, and then perhaps what one does to get rid of them if one has adhesions.

Let's just use an analogy for a moment. Let's just create a little scene. Think back to when you're nine or ten years old (if you're older than that now). And you're running. You're playing a running game with friends. And they're chasing you. And you're laughing because you're faster than they are. Maybe you're playing tag.

So, you cut off through this field. And while you're running, somebody off to your right behind you calls your name. And while you're running, you look back to see who's calling you, and bam, you don't see a stick, you trip over it—and whack! You land on your left hip and you give it a pretty good whack when you land.

The first thing that happens when you receive a trauma like that or you have a surgery or you have an infection or inflammation—SIBO causes inflammation itself, we'll talk more about that.

But in this case, a fall on that left hip, the first thing that happens is these tiny strands of collagen appear. They're very strong. They've been estimated at around 2000 lbs. per square inch. They're tiny. They come rushing in and start lying down on top of each other in a chaotic pattern, in a random pattern to help stop the bleeding, act as a patch to isolate the area that's been injured, to stop any bacteria that may have gotten in if your skin is scratched, to stop any bacteria from going to other parts of your body.

So they really form as the first step of the healing process. They're very strong.

So, then your white blood cells and your immune system go to work. You continue to heal. You might turn into interesting color on that hip for a few weeks even. A couple of months later, you're feeling pretty good. Three months after you fell, you really don't even notice that left hip anymore where you fell. You're perfect. You've got your wonderful three-dimensional sweater back. Your body is strong and supple, mobile—well, everywhere except in this one, little place at your left hip.

The crosslings, the little, collagen strands—we call them crosslings—that formed when you were first injured or had an infection, when you had tissue damage, the first strands that formed as the strands that formed as the first step in the healing process, if they have not dissipated in the first 7 to 10 days, they're there with you for life.

So, as you might imagine, probably all of us have adhesions somewhere in our bodies. If they happened on our buns, we fell on our—we might not even notice that in some places. When we scratched our skin, we've cut our finger, you could see this scar tissue on the top, but it's not really affecting you that much.

But when they happen in the delicate tissues of the abdomen and the intestines, they can really wreak havoc. They can squeeze the intestines shut as I indicated

earlier like a kink in your garden hose or a stricture, a narrowing, slowing or preventing food from going through, stopping the motility, the migrating motor complex.

And they're there with you for life. They're just not going away.

Larry Wurn: So, what does one do about adhesions? Well, there are really two things that have been shown in scientific literature. And I'm talking about peer-reviewed studies in the National Library of Medicine reviewed by physicians, biostatisticians and scientists found worthy of publication with actual success rates and data showing how well they do.

The two things that I know of that really address adhesions and have scientific backing are surgery and what we do. I'll kind of go through the science of that.

But surgery, as we've already looked at, causes more adhesions. So frequently, a surgeon will say, "I'll go in there if you need me to but unless this is a life-threatening condition, I think you'd need to learn to live with the condition because if I go in there, I'm going to cause more adhesions."

The other thing you can do and why Dr. Sandberg-Lewis was so surprised and the chief of staff of the hospital left the hospital and started following this was because we found out that there is a way to manually decrease adhesions. It feels to us like pulling apart the run in a sweater in really quite slow motion the tens of thousands or hundreds of thousands of these crosslings that have formed to create the adhesions. It just takes a while to get through that stuff.

Dr. Steven Sandberg-Lewis: Visceral manipulation, in order to help with the mobility of the organs and the abdomen, meaning, their ability to move with respect to each other, move around each other, as well as motility, to move things through the lumen or the inside of the tube, yes, that's a big part of what it's all about, especially bringing the stomach back down into the abdomen and keeping it there, and keeping that lower esophageal sphincter in line with the diaphragm, so they can work together. That's really important. That's really effective.

Shivan: So, it's interesting that we're talking about, of course, because these topics are very interesting, especially to anyone who has issues. But quickly, a little story about my visceral manipulation session that just happened two weeks ago. We've been working on a lot of different stuff, and my therapist, I call her a living CAT scan machine, because I'll ask her, "What's that body part?" And she can tell me and she's like, "Oh, your ileocecal valve is slightly rotated."

She came at my stomach from a different way. When I say came up my stomach, she was just palpating around and feeling around. It hurt a little bit more. Usually, it doesn't hurt. None of her work seems to really hurt, which is fantastic.

And she's like, "Wow, I really feel a lot of-"

She described it as tight, dry—these are just her descriptive words, not being literal, like fascia underneath. And then it explained my left shoulder blade pain, and then it also explained why—I was a yoga teacher, so I would do this, and I was always stretching my psoas muscle because I always felt so compressed here.

I was always like, "My psoas is so tight." It was actually probably from 1991 when I was in a car accident and the car came at me from this way, the seatbelt dug into me, and I went like this, and it probably caused a lot of adhesions and stuff under the stomach. That's my working hypothesis right now, but since we've released that, holy smokes, I feel like I can breathe, I feel like I can do this, which doesn't seem like a big deal to people. If you can't do it, and it doesn't feel good, then it is a big deal. And I just feel shockingly, totally transformed.

Dr. Sandberg-Lewis: Happy to hear that.

Shivan: Thank you.

Dr. Sandberg-Lewis: Fascia is a much-ignored part of the body that has multiple functions. I'm trained in structural integration, so I'm intimately involved with the fascia. It's amazing what can change so fast when you relieve an adhesion in the fascia, so that you don't have a little spot weld anymore, can open up, and things can move and be as long as they're supposed to be, instead of being all shrunken up like that.

Yes, it's great. And left shoulder is a common place for stomach, gastric stomach problems to reflux.

Dr. Stefani Hayes: The official name is the Arvigo Techniques of Maya Abdominal Therapy. So, Rosita Arvigo is an amazing woman, and she has split her career between Belize and the States for a really long time. And she was really gifted in that she is now the lineage holder for these techniques.

She learned from a Mayan shaman, Don Elijio Ponti, in Brazil, and a midwife there, Ms. Hortence Robinson, and took their techniques, as well as her own training as a naturopath. And she combined those into these Arvigo techniques, which is a gorgeous massage. It's very gentle and not deep visceral manipulation. It's just a gentle massage for the belly and the back.

As a doctor, I love doing the massage because it's every part of it. It's not just about relaxation, but it really has benefits to the nerves, the organs, working on the adhesion potential, the lymphatic flow, which is so important when there's been a long history of inflammation or congestion in the body.

And so, it's been a nice adjunctive piece in my practice. It's very well known for fertility, but it's so good for bowel disorders and chronic pain, which often times, those go hand in hand, but not always.

Shivan: I think one of the biggest things for me that has had an impact is visceral manipulation. When you hear the words visceral manipulation, it

sounds so brutal. But in actuality, it is so gentle. I'm astonished to how gentle it is, and it doesn't cause an inflammatory response, which I really appreciate.

When it comes to Chinese medicine and acupuncture, have you ever seen a direct result of improving SIBO through, maybe Chinese herbs and acupuncture versus the typical antimicrobials and antibiotics?

My Chinese practitioner here where I live, she doesn't really treat SIBO, but when we would do, like tonifying things for my intestines and that kind of thing, in motility in general, with the acupuncture, I was just wondering if you ever found a good, little combination of those types of things, or is it just a tonifying?

Dr. Hayes: We've definitely seen how Chinese herbs are magical, and I think it's incredible, especially since I was trained in it, but I would not say that I am specialized in it. I think that takes a lifetime of focus on it. It's a real deep, ancient medicine. And my colleagues who are quite good with Chinese herbs, we find that again, just like Westerners, where historically, the things we thought about for treating the gut and soothing the gut, as being these thicker herbs, these more gelatinous herbs, can be really aggravating for SIBO.

And a lot of Chinese granules are incredibly aggravating for SIBO because the Chinese herbs are tacked onto a corn or gluten or soy, and so then you're not getting the benefit of the herb. You're getting flared by the delivery method.

And so, then it usually leaves making your own Chinese herbs, which is amazing, but time-consuming, and really stinky, and very unique flavor profile. Some people love it, and some people hate it.

And the time for cooking and decocting those herbs yourself—if you have a good Chinese herbalist who knows that nuance and really can think through, I think it takes a branching off of the classical training because a lot of SIBO patients do need tonifying

because they definitely a weak gut and a weak ability to absorb but those tonifying herbs are often very sugary, very sweet.

Shivan: Are there any acupuncture points that can help with motility?

Dr. Ilana Gurevich: So definitely, theoretically. The best tools that I have to make people feel better right away is acupuncture. If you want to talk about clinical studies, acupuncture is by far the longest clinical study that we have because we have documented texts going back to the 1300s using acupuncture. I have tools that I can do to get your bloating to go down when you get off my table. A hundred percent. Diamond treatment. I can give you my recipe but if you have a well-trained acupuncturist it's way better than my recipe because a well-trained acupuncturist looks at your tongue and feels your pulse.

What they see when they're feeling pulse is not like what we do in Western medicine. They're not worried about count. They are feeling your pulse on two sides,

so they feel on each side on three different levels. So, three fingers are on your pulse and they feel the yang and the yin. They're understanding what's happening in 12 different organs just by feeling your pulse. The tongue is a map of the body. They can understand what's happening internally just by looking at the tongue.

My recipe doesn't matter because if you have a well-trained acupuncturist, they are treating you specifically the moment you walk into their office. Also, the minute you put needles in the pulse changes. You are getting immediate feedback if the treatment that you're doing is working. So, does acupuncture work? A hundred percent. However, if you ask the Chinese acupuncture works, they will say it's temporary. What the Chinese do is they give you their classical Chinese formulas and the difference between acupuncture and the herbs is herbs is kind of like acupuncture you give yourself three times a day

Dr. Marisol Teijeiro: So, what you do with this—and I should clarify that. Castor oil packs may take time in your body to work, but you still want to do them. And you can do them quickly and easily. And that's the point of it.

Castor oil can be consumed orally. And the history of it is long. Caribbean cultures, Indian cultures would use it as a purgative weekly.

I have so many patients that are Caribbean or Indian, and they're like, "Oh, yeah, I know castor oil. I take it every week." And it's a tradition that has happened because of the high levels of parasites in these countries—and the food and such.

So, this way, they would do a purgation in order to help improve the digestive tract and for them not to not have things like Giardia or any of the bad bacteria that can cause really bad gut irritation.

Shivan: Okay...

Dr. Teijeiro: So, orally, the recommendation as per Health Canada or the FDA is that it's done like one to three tablespoons, up to a maximum of six tablespoons.

The only thing is I tend to have patients not necessarily do that very often. What I prefer is the castor oil pack because it's softer, gentler. When you start taking castor oil orally, it's a laxative. So, it's very strong.

The nice thing about it is it isn't an irritant laxative like people think. It actually helps to stimulate nitric oxide in your digestive tract when you do take it orally. So that's actually more of a healing way for your digestion to have a bowel movement.

But again, castor oil packs topically will do the same thing. It may just take a little bit longer. But in my opinion, it's better to do the castor oil packs.

Dr. Christine Schaffner: So having the lymphatic system be one of the most overlooked systems in the body, one of the things that we look at is how do we get the lymph system moving and how do we help people feel better by treatment strategies to address it.

And the lymph system is critical in our immune system function. That's critical in our fluid balance in the body. And also, when we think about the gut—it's actually part of our lymphatic system in our gut—it's how we absorb fats and fat-soluble vitamins. So, we have a lot of gut inflammation, that might be impaired.

And then, when we look at what are the parts of the lymphatic system, we think about lymph vessels. There's this whole network of the lymphatic system in our body. We look at lymph nodes. And then, there's different tissues such as the tonsils, the thymus gland, the spleen. And the appendix is even part of the lymphatic system. So, I can talk more about that as well.

Shivan: I thought it was just like, you know, here and here.

Dr. Schaffner: Yeah... and those are big areas of lymph nodes in the body. And so again, when you think about the lymph system, it's really tied into our circulatory system. So, as our blood moves from our arteries, into our capillary beds, and out through our veins, part of that movement of blood in the capillary bed is where lymph kind of gets dispersed. And then, it goes through the lymphatic system where our immune system engages with foreign material, different pathogens, and tries to mount an immune response.

So, it's a really complex system. And I think in our modern chronic disease model, most people don't think about the lymphatic system unless you have lymphedema, or you've had lymph nodes removed. If you google a lot about the lymph system, you'll find a lot of information around cancer. But there's just this whole other aspect that we need to acknowledge and address.

And one of the things also, I actually mentioned the University of Virginia. And in 2015, I believe, they were one of the pioneering people who actually found out that we have a lymph system in our brain, and it's called the glymphatic system.

So, we've kind of known I mean, I would say in German biological medicine and naturopathic medicine, this isn't surprising to us, that we have a lymph system in our brain. But it was actually proven. And it's called the glymphatic system because it depends on the glial cells which are a form of our brain cell, an astrocyte that is kind of a PacMan garbage man in the brain.

And so, the glymphatic system, I think, is a really exciting discovery because we can look at, if we can improve the function of our whole lymphatic system and our glymphatic system, we can prevent neurological disease and all the cognitive decline that we're seeing in our patients. Shivan:

And brain fog?

Dr. Schaffner: Yeah, brain fog for sure. So, the glymphatic system, just to speak a little bit more about that, that only is the most active at night when we

sleep. So, we need to have a good night's sleep for lots of reasons. But this is kind of the top of my list of why to have a good night's sleep. And our brain actually shrinks 60% in size at night.

Shivan:	Wait, how much?
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Dr. Schaffner: Sixty percent.

Shivan: Six-zero...

Dr. Schaffner: Our brain actually shrinks to make room for the flow of the lymph through the brain. And so, then the lymph actually comes and bathes our neurons with nutrients. And then, it removes waste products that are normal metabolic waste products, but also things that end up in the brain that we really focus on like aluminum and mercury and viruses and parasitic infections and Lyme and co-infections.

And so, the lymph system is really critical in helping remove these things from our neurons, so we prevent neurodegeneration. The decline of the brain is really when neurons died. We're not able to communicate as well.

So, this is a huge, huge, huge piece of the puzzle that we've been really excited about.

Dr. Schaffner: But going back to the brain, the glymphatic system, part of the drainage is through the cribriform plate which is in the base of the nose. And it basically makes its way around the tonsil tissue and down downstream.

And so, it's so common in our patients—that's why I want to bring this up. We see that our patients have what's called a chronic tonsil interference field. So, these tonsils get in the way of brain drainage. Dr. Klinghardt calls them the toilet of the brain, if that puts it into perspective.

Shivan: What?

Dr. Schaffner: So, if that puts it in perspective... So, if this is clogged or congested, then that's going to contribute to more impaired fluid drainage in the brain.

And then, also, just to tie this into the gut, the tonsils are part of the gut-associated lymphoid tissue. So, they also kind of tell the immune system what's going on downstream in the digestive tract too.

So, I kind of think of the tonsils as a gut-brain connection. When we think of all the ways the gut and the brain are connected, this tissue has a huge impact on our immune system in both areas.

So, just when you're thinking if you have fluid buildup in the brain, think about the health of your tonsils. And then an outcome of chronic infections and chronic Lyme is that we find that there's narrowing in the veins in the neck. And so, it's called stenosis, so that kind of narrowing. And you said it yourself, the plumbing

issues. So, if blood isn't draining out of the brain as well, because downstream, it's congested are clogged, that's going to also affect drainage. And then the lymph flows along. It exits the brain along the vein. So, if there's that pressure buildup, the lymph doesn't have as many places to go.

So, what we have discovered—you know, there's so many tools to treat this as far as a home tool. There's the cranial compression that I'll share in a moment. But we also want to think about the self-lymphatic drainage massage because we want to open up...

Shivan: Let's do that...

Dr. Schaffner: So, we want to open up downstream. Dr. Klinghardt is on our website doing this too. But it's kind of vigorous. You actually want to pull your tissues forward and down. And so, basically, this kind of mechanical movement...

Shivan:	Am I doing it right?
Dr. Schaffner:	Yeah, mm-hmm

Shivan: Oh yeah...

Dr. Schaffner: And so, there's a whole lymph—so it's not only the tonsils, but the cervical lymph chain too. It's just massaging downstream. So it's all about opening up the neck.

Shivan: I already feel better.

Dr. Schaffner: But then, when you think about it, the patient population that I see, they've been in bed for a decade, or they're not moving around. And so they don't have all these tools or the capacity. So, a lot of times, we work with people with skilled lymph drainage practitioners. So, if you're not feeling well, I would absolutely encourage you to seek one out in your community.

There's a lot of different lymph techniques. We actually do something kind of specialized at Sophia. We call it Sophie Matrix. One of Dr. Klinghardt's German students brought this to us.

And the whole idea about this is actually—it's a manual technique. So with lymph drainage, you can use your hands. There are different devices that move lymph as well.

But Sophia Matrix is a way where we actually work, the practitioners work, on the abdomen first. So, they get the lymph draining in the abdomen first—which again, also when you think about congested lymph, you don't have to have a big belly to have a congested lymph system. We have a lot of surface area in the gut. And if you've had chronic digestive issues, from SIBO to IBS to chronic parasitic infections, to any type of dysbiosis, that can affect the lymph system in the gut.

So, we really work on manually getting the lymph in the abdomen to drain. And that allows actually, again, the head and the neck and the extremities to drain better as well because we don't have that fluid buildup in the gut.

And so, I really encourage people to, when they start going through treatment, doing manual lymph drainage.

Dr. Ken Brown: They have shown that people that do have that actually have significant trouble losing weight because of the slowing of the metabolism and slowing of the bowel and everything.

The deal is that the methane does several things. We initially thought that it worked as a local paralytic, which in simple terms, it does, it slows everything down. Now I think that there are some animal models that shows that it's actually discoordinated contraction. So, it doesn't do anything. So essentially it doesn't move. While it's there not moving, every little piece of food that you bring into your mouth you're going to have more time to absorb the calories that are there, once the bacteria are done breaking them down.

Then, it actually slows down the motility in the colon, so you're going to lead to more constipation. I don't know the exact mechanism, but I'm going to go out on a limb and say due to the inflammation, it actually affects your basal metabolic rate because you're fighting a chronic infection. So, your body is constantly in a low level of battle. That raises your cortisol, lowers your basal metabolic rate, and you start putting on weight. I see a ton of patients like that also.

Shivan:	Oh, that's me.
Dr. Brown:	They come in and they're like, "I'm eating less-
Shivan:	Yep, oh yeah.
Dr. Brown:	I have two bites, I bloat, and I'm actually putting on weight."
Shivan: math doesn't work.	Yep. Then the caloric intake just does not make sense. The

Dr. Brown: It makes a little bit more sense where I can sit there and say okay, you've probably got more of these methanogen bacteria or these methane producers and that's leading to all these other little issues, which is probably contributing to your weight gain. It's kind of throwing you off a little bit. So, I think that when Dr. Pimentel's pharmaceutical agent comes out, his biologic, SINO110 I think is

what it's called right now until they find a name, that one may be effective for the colonic methanogens because they're building it to get into the colon. That may be another weapon in this whole battle.

For somebody like you that you're like, "Well, my bloating's better, but I'm still struggling with my weight issues," that might be something to help with that. That's his baby, but I'm excited to know that we're going to have another weapon.

Shivan: So, I have read those studies about the weight gain being associated with a certain type of, or lack of probiotic or bacteria found there. Have they made in-roads into that, to really be able to fix it?

Kiran Krishnan: So, that's one of the things I'm doing. I have a research study going on right now...

Shivan: ...in all your free time.

Kiran Krishnan: ...in all the free time, one of the 14 clinical trials we have going on right now. We're trying to figure out what I call metabolic reprogramming. So that means we're going to reprogram your gut, so that you respond differently to food.

So, the simple idea was this. We all know that annoying person that can eat whatever they want and never gain weight, right? And people point at them and make jokes. There might be a couple of around here...

But we used to always say that they had a high metabolism. That was the explanation. As they sit around and walk around, they're just burning more calories than you and I.

But as it turns out, that's not really true. They have a certain conformation of bacteria within their gut that actually reduces the number of calories they absorb from any given meal.

For example, if you take somebody who struggles with weight, and somebody that's always been lean their whole life, given the same meal, the person that's lean can absorb up to as little as 200 less calories from that same meal than the other person. Ten or twelve of those meals over a week, that's a pound of fat.

So, that's how easy that can change for each one of those people. This person, they can continue to eat that and never gain weight. This person will gain the weight because of the extra calories that they absorb from that meal. It's called **energy harvesting.**

Kiran Krishnan: Now, there's other aspects of it as well, your ability to feel satiated once you eat. So, the whole satiety signal, which is ghrelin, leptin—ghrelin is a hunger hormone, leptin is a satiety hormone—and then there's adiponectin and all these things that control how much you eat, how your body responds to the food that you're eating... all of that is controlled by your microbes in the gut.

Your body's ability to burn fat for fuel is controlled by the microbes in the gut and the stuff that they produce in the gut in response to food.

So, if you're a lean person, what's happening—you're a naturally lean person, you have that lean microbiome. When you eat a meal, what's happening is the food's coming in, your small intestine stuff is being digested, you're extracting the nutrients, but then there's a cap on how many calories your body is going to absorb from that food.

And then, as it passes through into your large bowel, the pro-lean bacteria are going to convert that food to things like short chain fatty acids like butyrate that then go and stimulate your fat cells to trigger fat-burning in the rest of your body. And it's going to signal all of these hormones like leptin to tell you to stop eating. It's going to prevent your blood sugar from rising too much.

There are all of these mechanisms in place that your gut bacteria designed to enact in order to keep you lean and fit.

But because we screw our gut, our flora all the time, it's easy to get that dysfunction or dysbiosis where now we don't have those protective mechanisms.

One of the side effects of certain antibiotics is weight gain. And in fact, they've been using antibiotics in the cattle industry for years because it makes the cattle gain weight faster. When you kill off those microbes, the good ones, the ones that keep you lean, then you're going to end up gaining weight easier.

Shivan: And if you're a methane-producer, if you have SIBO, they...what did you call it? Harvesting?

Kiran Krishnan: Energy harvesting.

Shivan: Don't those archaea like to energy harvest more than the hydrogen producers?

Kiran Krishnan: They do and because of the methane, too, they screw up the environment in the gut, which means that pro-lean bacteria actually have less chance of proliferating to begin with. So, the ecology tends to get screwed up.

Shivan: a fix?	Okay. Well, we know the problem now. Are you working on
Kiran Krishnan:	Yes, yeah!
Shivan:	Okay
Kiran Krishnan: clinical trials.	So, we've gotten some interim data on the first part of the
Shivan:	Tell us everything right away!

Kiran Krishnan: This is really actually kind of cool and exciting. And we were very focused on visceral fat. Visceral fat is the most dangerous type of fat. That's the fat around the organs. Typically, you can't even see it.

And what's interesting about visceral fat is that you could have a high amount of visceral fat which makes you at a very high risk for all kinds of chronic illnesses but look relatively lean.

There are lots of people that are walking around with a BMI of 26, 25. They would be visually lean-looking. No one would ever think they have a weight issue, but they have very high amounts of visceral fat. And that's very dangerous. It's so dangerous for your heart. It's dangerous for your immune systems. It's dangerous for your brain and so on.

So, we were focused very much on the visceral fat. But of course, if we can lose some subcutaneous fat—which is the fat we all see cosmetically—that's positive too.

Shivan: Sure.

Kiran Krishnan: So, the data that we are seeing initially is a significant change, a significant reduction in people's visceral fat mass, and some change in the subcutaneous fat mass. But then, the other really interesting part of it is we're seeing a significant increase in people's lean body mass without exercising.

And all they did was take a right mix of a probiotic and a prebiotic. And over a 90-day period, we kept measuring different aspects of them, including full body composition.

So, imagine putting on lean muscle...

Shivan: [drum roll] ... what happened?

Kiran Krishnan: So, we're seeing significant fat loss, especially visceral fat loss. And we're seeing a significant increase in lean body mass. So, we're completely changing their body composition without them having a diet, without them having to do any exercise at all, just taking a probiotic and a prebiotic.

Now, if you can imagine what the results would be if you did do a little bit of dieting and exercising and eating smart and modify your lifestyle...

Trudy Scott: So, this boils down to figuring out the root cause of the cravings. And it can be a number of factors. If you have low GABA symptoms—and the low GABA symptoms are the physical tensions (you'll feel it in your shoulders, you may go tense), you may have that physical pain in the belly, you may have other physical pain or issues—you will crave to come down. So, if you crave carbohydrates to relax, or you feel like you need that glass of wine to relax, then it's a clue that you're low in GABA. And the GABA is going to help with all of that physical pain, the physical tension. And it's going to help with that craving that you're using to destress.

Now, if you are craving for more of a happiness-type of feeling, like if you want carbohydrates and you feel happy once you have the carbohydrate (the cookies, the gluten-free cookies, maybe you sort of found this gluten-free alternative which I'm not a big fan of because the gluten-free products are highly processed. So, if we're going gluten-free and grain-free, we need to be cognizant of all the processed ingredients in some of these gluten-free products. But whatever it is, maybe it's chocolate), if you're using that chocolate to self-medicate in order to feel happy, then it may be low serotonin.

And some of the other low serotonin symptoms that would clue you into whether it's a low serotonin thing is the anxiety where it's in the head—the ruminating thoughts, the worries, the fears, the phobias, PMS, insomnia, irritability. Even anger issues can be related to low serotonin.

So, if you're craving and you've got these symptoms, then it could be a clue that it's low serotonin. And that's where tryptophan is going to help the cravings.

Now, some people will have low GABA and low serotonin. And you will find it's going to benefit the cravings in both areas.

Now, there's another area that is a big one. And that's low endorphins. So, if you're the kind of person who just loves a certain food, "I just love chocolate" or "I just love ice cream," you just love it so much—

If someone said to you, "How would you feel if you never had it again," and you feel very emotional—like some of my clients will get this little tear in their eyes. "I'm going to have to give it up forever?" As a SIBO sufferer (and a lot of people can relate to this), we gave up so much already, and now you're being told you have to give up something else.

So, if you feel this really strong emotional connection to a food, it could be low endorphin. And there's an amino acid that helps raise endorphins. And it's called DPA, d-phenylalanine. And when you take DPA, it feels like someone gave you a big hug. And what it does in terms of the craving's aspect, it helps with that comfort eating, that reward eating, and that feeling like "I deserve it."

So, you ask which amino acid to use? It could be GABA. It could be tryptophan. And it could be DPA.

There's also glutamine if you've got low blood sugar and you crave because you've got low blood sugar. And then, the final one that I use in terms of amino acid is tyrosine. And that's if you're using sugar or carbohydrates or something, you're craving, whatever your drug of choice is, to give you energy.

Shivan: Okay, I have to talk to you about the underweight patients because they don't get talked about as much. Carlene, I'm thinking of you. She wants wrote me an email, it was like: "You're doing great, but come on, sister, help me out here. I'm underweight." And it's serious! That's really, really serious. It really can

become life-threatening, of course; as obesity can as well. It's very frightening. Can you help that too?

Kiran Krishnan: Sure. So, the old saying, "you are what you eat" has to be changed to: "You are what you absorb." It almost doesn't matter what you're eating if you can't absorb it.

People who are severely underweight, people who have a frailty to them, people who have this failure to thrive, even younger kids, those people tend to have an inability to absorb and assimilate the nutrients that they're taking in either through supplements or foods... it doesn't seem to matter.

So, there's a very important control mechanism involved in how a nutrient gets in from your lumen (which is the tube in your intestines or your stomach) into your circulatory system where it can actually feed your cells. That control mechanism, if it's dysfunctional because of inflammation or it's dysfunctional because there's some sort of damage to it—whether it's disease like in the case of Celiac. So Celiac subjects, for example, tend to have a much higher prevalence rate of tooth decay and osteoporosis than non-Celiac people because they can't absorb fat-soluble vitamins because their intestines are so inflamed.

And then, the microvilli in the intestines, all those little beautiful finger-like projections, what those do, the reason they even exist is because they add surface area to your intestines. And that surface area is really important for assimilating and absorbing nutrients. And if we don't have enough surface area, we don't have the breadth, the ability to absorb the nutrients that are coming in.

So, in cases like Celiac or other inflammatory conditions in the bowel, you get something called enteropathy where those finger-like projections actually blunt to a point where your intestinal lining can actually look flat. And you lose length in your intestines. And that's actually a significant problem because you're not absorbing all of the good foods, you're putting in.

So, there are a lot of people that work so hard to make the right decisions and the right choices, to eat the right things, or take the right supplements, but they're not even absorbing it.

So again, it all comes back down to the gut microbiome. If we're not addressing that fundamental problem, then nothing else will matter as much. When we do address that fundamental problem, everything else we do gets in hand. All the other good choices we make get enhanced...

Shivan: ...and work the way they are theoretically supposed to...

Kiran Krishnan: ...they're supposed to, yeah.

For the longest time, we've been doing studies on the human system, on our own cells, looking at our genetics, looking at our biochemistry. And as it turns out, we've been looking at less than 10% of ourselves. The other 90% of how we function and how we

respond to the world around us are in the microbes. And we finally started tapping into the other 90% of the human system.

And when you do that, you start to see that so many of the conditions that we felt were bad luck, bad genetics, whatever it may be, are actually curable, are actually reversible. They all are an ecological issue, not a genetic issue.

Shivan: An ecological issue, not a genetic issue.

Kiran Krishnan: They're an ecological issue.

Kristy Regan: Well, my key message is always don't give up. Keep coming back to yourself to find what's right for you. And part of that I believe is nutrition, part of that is finding the right team of people, and part of that is the mental/emotional piece, to not give in to the food phobia, to find ways to put yourself into a relaxed parasympathetic state for self-care. These are three integral pieces that really need to be incorporated in order for us to heal.

Ocean Robbins: So, if that works for you, great. If it doesn't work for you, find what does. You're your own expert, the only expert on your body and your health. Everyone else is just a resource.

Shivan: Say that again please.	Whoa! Wait a minute. Say that again. That was awesome.
Ocean Robbins:	You're the only expert on your health. Everyone else is just
a resource.	

Shivan: Think about that. That's really powerful.

Dr. Partha Nandi: But remember, purposeful life. Take out the stuff that's extraneous and you'll notice a huge difference in your life in a short period of time. No pills needed, no formulas, no programs, no this, no that.

I tell my patients instead of reaching for the next pill in your cabinet, reach within yourself. You have all the tools that you need. You just have to get out of the way.



"I Know What It's Like To Live With SIBO And Gut Issues. And exactly how confusing, overwhelming, & painful it can be. Sometimes living with the symptoms feels easier than trying to get help. I don't want you to suffer anymore. SIBO SOS™ has the tools you need to make getting a healthy gut simple." ~ Shivan - SIBO Patient & Founder of SIBO SOS®

My name is Shivan Sarna, and I've suffered just like you. And while I could have let my pain rule my life... I decided instead to find its root causes - so I in turn could help others. It's been a harrowing journey. I've seen it all and done it all - from acupuncture and Ayurveda, to colonoscopies and emergency room trips. I've always been 100% committed to revealing the truth about what really works in addressing our gut issues and what doesn't... the latest research and innovations... and who are the "best of the best" when it comes to gastroenterologists, naturopaths, functional medicine practitioners, scientists, nutritionists and more. As a TV personality for the last 20+ years, I gather all of this information and make it easier for patients and practitioners to understand.

And remember, there is always hope in healing. XOXO, Shivan

