



Your Functional Medicine Expert®
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[#131: Dr. Jill interviews Dr. Shelese Pratt on Gut Health with a Microbiome Deep Dive](#)

Dr. Jill 0:12

Hey everybody! Welcome to another episode of Dr. Jill Live. I am here with one of my dear friends, Dr. Shelese Pratt. Thank you for your patience. I know we said 11:00, and we're just a little after Mountain Time, but we were just prepping and making sure all the electronics work so we could be live with you today. It was a little glitchy; maybe it's the weather, who knows? Today, like I said, I have my friend and colleague, the brilliant Dr. Shelese Pratt. I'll introduce her. We're going to talk today about the gut microbiome and some of the things you may not know, like how much genetic material it actually holds and why it impacts your genes, your outcomes, your health, and your symptoms—maybe even more than your genetic profile. We're going to bring into this webinar some actual tests from real patients. So, if you have test results, or you want to look at your own and follow along, I think it'll be very, very insightful for that deep dive into how to look at all these markers. And if you have missed any other episodes, you can find all of the rest of the episodes wherever you listen to podcasts, on iTunes, Stitcher, or YouTube.

Dr. Jill 1:15

First of all, let me introduce Dr. Shelese Pratt. We're neighbors; we're both functional medicine practitioners, and [we're] aligned on so many things. It's always fun on weekends at the coffee shop, on hikes, or here live with you if we can talk about these things. We think a lot alike about this. She's incredibly brilliant at looking at genetics and going into the deep dive, so we're going to have her share her expertise today. She believes in individualized integrative medicine. Her practice in Lewisville is focused on complex medical conditions relating to metabolic diseases. She uses functional medicine and her expertise in methylation and physiology to help her patients get to the root cause of their symptoms through a strategic approach. You will find she's brilliant; she's so good at looking at genes and all the details of how that affects your functioning and diving deep into the testing and all the analects, the metabolic profiles, the organic acids, and [other] things. We're going to dive into that today. The modalities she uses in her practice are traditional and specialty testing, nutrition, diet, nutritional supplements, botanicals, environmental medicine, classic homeopathy, and hydrotherapy. Dr. Pratt, welcome, and I'm so glad to have you here today.

Dr. Shelese Pratt 2:26

Thank you so much for having me, Jill. It's great to be here.

Dr. Jill 2:29

Yes. So let's just start and frame this. We're going to actually share some slides and some information in a few minutes. But, let's frame this for people. We've talked, and you and I [both] know how important the microbiome is. But why would this be, maybe, a first place to start with health conditions and the first place to look?—because it obviously affects so many systems.

Dr. Shelese Pratt 2:50

The microbiome is massive; we should really consider it another organ in our body. It has a huge influence on how all the levers of all of our genes work because there are trillions of bacteria, fungi, and viruses all influencing our expression on our skin, in our mouth, in each tooth, in every organ of our body, but especially in the GI. As a naturopathic doctor, from the very beginning of my education, one of my first classes was [on] the nature cure. We always talked about poop; we always talked about what we now call the microbiome because we believe that all health starts in the gut. And now that we're getting so much rich and amazing research back about the microbiome, we are starting to see, "Wow! That is the basis for: Will you spin into diabetes? Will you spin into heart disease? Will you have neuroinflammation that leads to a degenerative case like Parkinson's?" We have all of these microbes that are influencing us, and they're influencing our own genetics. It's a big part of our epigenetics, but it's also the basis of our neurochemistry, our immune system, and our hormones, actually. So, I don't think that we can really talk about health without mentioning the microbiome anymore.

Dr. Jill 4:25

Yes, isn't it interesting? I think I've seen statistics where, 20 years ago, there were, maybe, hundreds of studies, and then there were thousands. And now, if you look at the exponential curve of the research that's come out on the microbiome, it is literally exponential. I remember even writing about it in the book—leaky gut was a term that was totally poo-pooed by conventional medicine for decades. When I was diagnosed with Crohn's 20 years ago, it was like, "Oh, there's no such thing." Well, now the literature is talking about how leaky gut—we also call it intestinal hyperpermeability—affects obesity, diabetes, and heart disease. Now, as you and I both know, there are thousands and thousands of studies. I wonder if it's now one of the most common topics in research if you start to look at the gut microbiome. Even though we think drugs work on us, many of them work on our gut, don't they?

Dr. Shelese Pratt 5:15

Yes, absolutely.

Dr. Jill 5:17

Do you have any examples or things as far as how much that can play a part?

Dr. Shelese Pratt 5:21

They've realized that cholesterol medications act more on the microbiome than anywhere else. With lots of drugs, we thought the mechanism of action was one thing, and we're finding now, "Wow, it's very different," like the drugs that we use for mood or behavior. There are new treatments for cancer now that specifically target the microbiome. I think that [in the years] to come, we'll see more cancer drugs that actually get to the microbiome of the tumor site because we now know there's a microbiome that's created if you get cancer and it were to develop. You and I just saw an article and went back and forth about how at the beginning stages of, I believe it was breast cancer, there was no fungus present [but] by stage four, there was a tremendous amount of fungal presence at the tumor site. We are starting to see the microbiome as: "Wow, it's ever-evolving, it's ever-changing, and it's influencing us wherever we look."

Dr. Jill 6:28

I love that. That's funny. As you were saying that, I was thinking, "Oh, that study we just shared." In the study, breast [cancer] was a big one, but almost every type of cancer they studied, biopsied and looked at under the microscope [had] fungal elements. And the question in my mind was: which came first? Did cancer weaken the immune system so that the fungus was able to take hold? Or did the fungus actually proliferate or cause the worsening of cancer? Maybe you know the answer to that; I don't know. But I'm guessing it's twofold.

Dr. Shelese Pratt 6:53

I think that those are great questions for us to ask. As functional medicine doctors, [and] naturopathic doctors, we are thinking in those terms and trying to sleuth that. But what we do know is that mycotoxins and a lot of fungal exposure really set us up for a lot of other health conditions. We know that there's a microbiome shift when either you live with mycotoxins or you have a lot of fungal colonization within different tissues of your body, so I can't answer that question yet. I don't have enough scientific data to say one way or another, but I can for sure say that it seems like they would be good questions to ask and keep watching.

Dr. Jill 7:40

And I want to move on to your information, but I want to comment really quickly on my own experience. I think growing up on a farm, a lot of the pesticides and herbicides changed the microbiome of the soils, and I think some of the changes reflected in the human body are because of the lack of diversity in the soils, and we're seeing that. Interestingly, a lot of the things that are antimicrobial, like glyphosate, affect the bacteria in the soil, and then you get this fungal overgrowth. So, I think there's this reflection of more and more issues with changes in the microbiome that's actually just part of our soil changes and our environmental changes.

Dr. Jill 8:13

You also mentioned how cancer therapies—I want to know more about that—can maybe start to target the gut microbiome. Twenty years ago, when I had cyclophosphamide, one of the classic chemo regimens for breast cancer, I later learned that one of its mechanisms is to poke holes in the gut and create more permeability. The immune system gets a whole deluge of stuff from the gut that triggers immune inflammation, so it's almost like you create this leaky gut. That was one of the mechanisms in mice. Who knows how much it played into it? For me to get Crohn's six months after chemotherapy, it's totally connected because that chemo caused more leaky gut and more dumping of the product into my immune system. And then, my genetics made me prone to the self-autoinflammatory reaction. [It's a] side note, but it's interesting because it's exactly what you're saying.

Dr. Shelese Pratt 9:00

Well, and what we see is that leaky gut, whether it's drugs or antibiotics, whether it's foods that are causing that, whether it's a microbiome shift, these things are causing autoimmunity or other levers to be turned in our own genetic expression; that's called epigenetics. I absolutely think that's fascinating. And although it saved your life, there was other work to do on the other side because it pushed too far in one direction, right? We are always trying to create balance and harmony.

Dr. Jill 9:36

You mentioned autoimmune disease, and I think we're seeing a tsunami, an epidemic of autoimmunity because it's all siloed. We have the rheumatologist for arthritis, the gastroenterologist for Crohn's and colitis, and the neurologist for MS. Often, we don't think of it as one big whole; I know that you and I think holistically.

Do you want to share a little bit about: Why does autoimmunity in the gut matter? Why does the gut matter to autoimmunity? That's ground zero, isn't it?

Dr. Shelese Pratt 10:02

Sure. We believe that there's a lot of inflammation that starts, and what we need to do is run tests often to know: Is it their butyrate, propionate, or acetate? Are those short-chain fatty acids off? Are we missing keystone species that we're going to talk about today that cause more inflammation? So, it's not just about the food. It used to be that when we talked about leaky gut, everybody ran an IgG food sensitivity panel, and I think you and I rarely run those anymore. Would you agree?

Dr. Jill 10:41

I totally agree.

Dr. Shelese Pratt 10:42

Because that's not the answer. Usually, we have to go to the microbiome and see what is inflaming the gut. It could be driven by a food like gluten or dairy. But a lot of our patients, Jill—and I see a lot of motivated patients that come in—are already on an AIP diet, and they're still battling autoimmune [disease] and inflammation in the GI. That's when you have to take it to the next step and figure out: What is it? Is it an infection within the GI [system]? Is it other latent infections like Lyme that have poked holes? Is it mycotoxins that they've lived with or that they didn't even know they were exposed to that have completely changed the microbiome and made them more susceptible to inflammation within the gut? That's the detective work that we as doctors have to figure out for the patients, [and those] are really medical mysteries; nobody can really figure out what's going on with them. Did that answer your question about autoimmunity and the gut?

Dr. Jill 11:43

Yes.

Dr. Shelese Pratt 11:42

LPS is triggering more inflammation to come from the brain because the vagus nerve gets involved. When that LPS dumps, it actually makes something called interleukin 6, which hits the vagus nerve and goes right up to the brain, and causes neuroinflammation at the same time. Then the brain comes back to say [in essence], "We're inflamed; we're inflamed. What should we do? Batten down the hatches in the GALT, which is actually where our lymphatic system lives. And 70%

of our immune system comes off of the GI [tract], so it gets really confused when we have these leaks and gaps. I think everybody on your channel pretty much understands what leaky gut is, but these larger molecules get in, causing the immune system to flare, and then we tip into autoimmunity or some other inflammatory condition.

Dr. Jill 12:37

Correct. I love that. You framed it perfectly. And I wanted to mention [something about] the food [we eat]. If you're listening and you have an IgG food sensitivity profile—I love that you mentioned that—I wanted to just clarify that it's not that those aren't real sensitivities that you could be experiencing systemically, but you and I agree, Dr. Pratt, that it's an innocent bystander. What happens is, say you have these holes—I always say it's like your gut becomes like Swiss cheese, so you have all these holes—and you eat corn. Your corn antigen goes through, and all of a sudden, it's in the bloodstream, where it should never be as a whole molecule. And the body is like, "What the heck is this corn doing here?" It creates antibodies to corn, antibodies to soy, and antibodies to wheat, so you come up on your test like a Christmas tree, and everything lights up with your sensitivities. It's not that those foods are the culprit causing your illness; they might contribute to inflammation because they're poking the immune system. But to you and me, Dr. Pratt, it's a symptom of a leaky gut. We see that light up whenever they're sensitive. If you looked at my gut, since I had Crohn's, it has all kinds of sensitivities. That's not because the foods are the main culprit; they contribute, but it shows that I have a leaky gut or that someone [else] has a leaky gut. If anything, when I do order it, it's more to prove to myself and the patient, "Hey, there is a leaky gut here. We need to take care of it." We don't need to bastardize the foods; we need to say, "Why is that happening?" And "How can we get you to eat more food and be less restrictive?"

Dr. Shelese Pratt 13:58

Well, you're singing to the choir here, because what we really want to do is expand your diet eventually. When you have that light up like a Christmas tree on that IgG panel, it's probably because there may be a few on there that you have to continue to avoid, right, Jill? Gluten and dairy are pretty hard. Once that gets going, and if you have certain genes like HLA genes in your genetic report, you probably should never eat gluten—ever—because that's going to continue to create a problem in the gut. But you can bring back foods. That's what Dr. Jill and I want everybody to know: There are certain foods that can come back. You don't have to be so restricted for the rest of your life when your microbiome and your GI are rebuilt.

Dr. Jill 14:49

I love it, love it, love it. We could do a whole talk—I think we kind of did—on the foods. Let's dive in then. I don't know if you want to frame anything else or if we could dive into some case studies you have for us.

Dr. Shelese Pratt 15:00

Yes. What I want to mention is that, yes, you may have been born by cesarean and not been fed some of your mother's microbiome going through that canal. But for all the mothers that are preparing for this, I just want to remind people [that] one of the benefits your child will receive by going through that vaginal tract is getting colonized. I want to tell people there's plenty we can do to rebuild the gut if you have a cesarean. If you can take some of that colonization and put it on their skin after a cesarean, it does make a huge difference because how we absorb iron is forever imprinted by having a vaginal birth and also by the colostrum that we receive from breastfeeding. Again, there are people that can't have a vaginal birth, and there are people that can't breastfeed. But anything we can do to help the microbiome in those early days by supplementing in the ways that I just spoke about [can be very beneficial]. I just want to mention that that's something that I want more new mothers to know.

Dr. Jill 16:11

I couldn't agree more. Absolutely. Again, we know there are emergencies; that's why cesarean sections save lives each year. But if it's scheduled around your doctor's golf schedule, maybe ask for another doctor, because that's the kind of thing that's like, "Ugh, come on!" I don't like that, and we can change that.

Dr. Shelese Pratt 16:28

Or re-inoculate them; it doesn't have to be complicated. You just go ahead and give them that culture from yourself. So [when it comes to] antibiotic use, a lot of people have a lot of antibiotic use in their lives. You can rebuild from this. If it's earlier than the first two years of life, it's a little harder. But there are still things that we can do [like] running a good microbiome test or understanding how to rebuild the microbiome, which can be easier than you think. It's not expensive to rebuild the microbiome, right, Jill? That's one of the foundational [things], and it's wonderful because you and I can't see everyone. But anyone can listen to this, watch this on your YouTube video, or on all the different platforms you're on. And what I want to tell people is that you don't have to make \$100,000 and shop at Whole Foods every day in order to shift your microbiome. There are some simple, easy ways to do it. And yes, you will get more if you can stay away from pesticides, herbicides, and glyphosate—I have to say that. But I just want to mention some of these things

before we dive in because we're going to talk about dietary changes. [With] my slides, I'm just showing you the test. Jill, you chime in. Please chime in. Do you want me to bring that up?

Dr. Jill 17:51

Yes, perfect. And while you're doing that, I'd love your opinion. But you [mentioned] some foundations. We know spore probiotics can help with diversity, so that can be a good foundation for adults. And when you mentioned children, mother's milk [contains], of course, colostrum, but you can give the Bifidobacterium species to infants. Do you have any comments on what you might give a newborn baby who is cesarean born, a one-year-old, or a two-year-old for probiotics? What would you do for that baby?

Dr. Shelese Pratt 18:18

Well, I really like Nigel Plummer's work. I think he makes probiotics from Pharmax and Seroyal, and he has an infant formula. He has one for breastfed [babies] and one for non-breastfed babies. And I love—I think it's HLC Baby Infant. That's a great formula, in my opinion.

Dr. Jill 18:38

Perfect, yes. That has more Bifidobacterium, right?

Dr. Shelese Pratt 18:42

Yes.

Dr. Jill 18:42

Are you able to [screen] share?

Dr. Shelese Pratt 18:43

I can't share yet. I need permission.

Dr. Jill 18:45

I just clicked it. There you go.

Dr. Shelese Pratt 18:47

Okay. So, everybody can see this, and I'll put it in presentation [mode]. Oops, we got a little far ahead. Sorry about that. Okay, that's me. What I'm going to show you today is my favorite microbiome test. Let me say a little about why I like BiomeFx. I've run all of them, really. I've run the DiagnosTechs, I've run Doctor's Data for years, I ran Great Smokies [Diagnostic Laboratory] all the way back, [and] I ran Genova [Diagnostics]. Although I like these for gallbladder function, [and] how we break down our proteolytic enzymes, [and] how they're functioning for our pancreas, I don't think they do a great job at the microbiome. If you tested yourself five days in a row, many of these other tests would be different every five days, whereas [with] this BiomeFx, CosmosID has figured out a way to make it way more reliable. I don't know, Jill, if you've run very many of these.

Dr. Jill 20:01

I totally agree. We're getting to the next level. And what's happening is that other companies that you mentioned are starting to get on board. I think Genova is having one similar, but this is right now the leader. I would agree with you.

Dr. Shelese Pratt 20:15

It's good at what it's good at, and it's not [good at] what it's not good at. It's not great at pathogens. There are other companies that are better for pathogens. But this is going to tell me [about] those keystone species; it's going to tell me about sacral lytic fermentation—we're going to go through all of these things—and it's going to tell me about diversity. So, the first thing that you look at on this test is that it gives you a general idea of all of these other markers in one score. What we really want is for that score to be close to 30. The further down it is from 30, the more work we have to do. This isn't a patient that's really far off. I'd have to say that most of my patients, [for whom] I run this, are not really far off from 30. Every once in a while, I get one that is, and there's more work to do. But I just want to say, you might think your microbiome is really off, and we're going to talk about how this particular young man—even though he's 48, he is a young man; 48 years young—has had tremendous GI issues and weight issues and has struggled with what to eat. Really, we figured out by this test, what was going on, finally. And his [test score] wasn't that far off the mark.

Dr. Shelese Pratt 21:41

Alpha diversity is the number of species within your microbiome, and beta diversity is the differentiation within those species. We really want alpha and beta diversity. We want the number of species to be very different, and then, within those species, we want all of them to be very different, too. Diversity is key. AMR richness has to

do with the resilience of our GI. There are a lot of environmental influences on this. This is the time where I'm not going to talk a lot about resilience, but are you trying to stay away, where you can, from pesticides, herbicides, mycotoxins, infections [and] EMF? We know that that significantly changes the microbiome, so no laptops on your lap near your GI. It's one of the wonders. We wonder if that's why colon cancer rates are skyrocketing because we've had cell phones and computers on our laps for the last 20 years.

Dr. Jill 22:50

In our pockets, in our lap. Yes, totally.

Dr. Shelese Pratt 22:53

Yes. There's a whole lot. I think you and I talked about EMF at one point. It is influencing the microbiome, so you should know this.

Dr. Jill 23:02

Just a [inaudible]: If you look at my past live [episodes], Dr. Pratt and I have a live [episode], where you presented [information] about all the EMF stuff, and it's really good. So go back and watch that episode again.

Dr. Shelese Pratt 23:13

And the microbiome is sensitive to these things. It's sensitive to the amount of exercise you get, sensitive to the amount of sleep you get—it's sensitive in all regards. The AMR richness is the resilience of the microbiome. Pathogens—again, I'm not going to spend a lot of time talking about [them]; this test isn't amazing at it. But what it is great at is these keystone species telling you, [for example], "Akkermansia is low." Why is that a big deal, Jill? Tell me why, because you know.

Dr. Jill 23:44

That is my favorite keystone species. When you mention 'keystone,' all that means is [that] these are a bigger marker of diversity than anything else. So, literally, if you have loads of Akkermansia versus zero, that alone can predict your diversity. I always say it's like back in Ireland, when all the farmers were like: "Hey, this potato grows great. Let's get the same seed." They grew all the same seed, and then a blight came. I don't know what happened, but they all lost their crops because there was no difference in the types of seed in the potatoes, so it wiped everything out. And you can think about that as your microbiome because if you have multiple strains

and diversity, you're going to be more resilient to disease, autoimmunity, and [other] things. This is just one marker that's really a big deal with diversity.

Dr. Shelese Pratt 24:27

It also basically influences the amount of mucin you have protecting that microbiome because Akkermansia is responsible for helping keep up that level so that the right things can get down and influence the GI lining and other things can't. So having [a] low [level] is going to throw off what's influencing the GALT, or the immune system of the GI, as well as the integrity of the GI. But I also stand back and say, "Okay, Bifido[bacterium] longum, Bifido[bacterium] adolescentis... " One thing we should all know is—I don't know if it's the antibiotics that we've used for generations at this point—Bifidobacterium adolescentis is really getting rare in younger populations; they don't have it anymore. We really want to create more of this if we can—the Bifido[bacterium] species and the Lactobacillus species. And you're going to see more about that when we talk about short-chain fatty acids.

Dr. Shelese Pratt 25:32

But if you see this particular gentleman, he has [a] very low [number of] keystone species and many of them are missing, which will foreshadow why metabolic issues are at play here. And then functions; we're going to get dirty in these functions, so we don't have to go through all of them right here. Again, these keystone species, as Jill said, are so important to diversity. But specifically, they also produce butyrate. Butyrate is so important to our metabolic health. Not only [does it influence] our glucose metabolism and our hormones, but it also influences our mitochondria, which is the organelle in our cells that makes energy. And that organelle is one of the most important pieces to watch in health, right, Jill?

Dr. Jill 26:27

One hundred percent. I was just going to mention that I'm teaching on the cardiovascular microbiome, which you might think, "How are those related?" Heart disease and butyric acid, or short-chain fatty acid production is one of the biggest indicators of whether or not you have serious heart disease, so it's connected to other organ systems as well.

Dr. Shelese Pratt 26:43

Right. These keystone species that Jill and I talked about are so important to the downstream effect of how our physiology unfolds and what's turning on genes or turning off other genes. We can actually manage this; we can change this. Acetate

producers—what does acetate do? Jill, do you remember? I'm trying to remember, I think it has to do...

Dr. Jill 27:10

It's another anti-inflammatory.

Dr. Shelese Pratt 27:11

It's anti-inflammatory.

Dr. Jill 27:13

There might be more.

Dr. Shelese Pratt 27:14

But anyway, each one of these different short-chain fatty acids performed... We need lactobacillus in order to make lactate, which is another part of our metabolism. I'm just showing you how it's connected. For this person, they really struggle. They have very little butyrate, very little propionate, and very little acetate. [As a result], their ability to function properly in terms of their immune system, hormones, and weight management is influenced. We want to feed these bacteria so they [can] make butyrate for us. I think, Jill, you do use some butyrate in your practice. I typically try to give them the foods that the bacteria like so that I can try to bring them back. But have you found that giving butyrate is helpful?

Dr. Jill 28:10

I do, especially in cases like severe Crohn's, colitis, or someone who's in really bad shape where they may not be absorbing foods as well. I want to hear more about it because I always feel like food is better than supplements. I can't wait to hear what you have to say about that. I think that's the first step. But if you're not making it—or even post-COVID or long COVID—spore probiotics, bovine immunoglobulin, and butyrate are the three things that I like to use for really inflamed guts after an illness or after some insult.

Dr. Shelese Pratt 28:42

Yes, [there is] one other thing I want to bring up about propionate that people may not understand. And I don't know; I haven't seen high propionate [levels] in other labs, but I have seen it on the BiomeFx. I don't know if you've seen the research that suggests that high propionate in that mother can increase the risk of autism. If you

are thinking about having a baby in three years, two years, or six months, it might be really good to run some of these tests and start using bovine immunoglobulins and some of the resistant starches or prebiotics to help manage propionate, acetate, and butyrate. Again, acetate—I just saw it—is also really important for the integrity of the gut.

Dr. Jill 29:42

Yes. I will say that these whole short-chain fatty acids—which are propionate and acetate; all of these we're talking about as a group—are the fuel for the cells that line the gut. If you have damage, you have the Swiss cheese gut; this is one of the ways you can regenerate your leaky gut or your problem [in the] gut. I just want to frame that because this is the fuel for those cells that line the gut.

Dr. Shelese Pratt 30:02

These are the foods that they love. I thought I'd bring up this slide. Again, [it's recommended to consume] these resistant starches [found in] plantains, green bananas, beans—if you're not lectin-sensitive, of course—peas, lentils, whole grains, or whole oats. Again, try to get it without glyphosate—oats. I don't know, Jill; a lot of people are [using] oat milk these days and the amount of glyphosate that's in oats [is high].

Dr. Jill 30:32

I couldn't agree more. I was going to mention glyphosate because I saw another thing on beer and wine. Hopefully, you're not drinking a lot of alcohol because that's not great for your gut either, but that is loaded [with glyphosate]. There was so much in the California wines and the beer. But then, like you said, [also with] oats and oat milk. Quaker Oats—I'm just going to name them—was one of the highest-[rated] foods with glyphosate out there. If you're getting oats in your diet, you must pick organic—this is non-negotiable.

Dr. Shelese Pratt 31:00

Or oat milk that is organic.

Dr. Jill 31:02

Make your own, maybe.

Dr. Shelese Pratt 31:04

Make your own. [inaudible]

Dr. Jill 31:08

Yes, exactly. So, a quick question, because we have a lot of people who are, for one reason or another, on a Paleo [diet or] a grain-free diet. There are lots of grains [inaudible] and lots of non-paleo foods. They could do green bananas. But what would you say would be our best sources if you are grain- or legume-free?—because there are clearly still some good things there.

Dr. Shelese Pratt 31:26

Well, I think they can do onions, leeks, asparagus, chicory, Jerusalem artichokes, and garlic. And we're going to talk about the situations [in which] they can't do it—some of the higher sulfur foods. What else? They might be able to do plantains or green bananas because those are very low in sugar. If they don't have a lot of mycotoxin exposure, they can do some of these beta-glucans as well: Reishi, maitake, and shiitake. If they don't have a dairy sensitivity, intolerance, or a casomorphin experience going on in their brain, they might be able to tolerate yogurt or things like that.

Dr. Jill 32:13

And actually, the SCD and the GAPS diets both use that homemade yogurt as a huge source of healing. The caveat there would be if you're super histamine sensitive; fermentation tends to be higher in histamine, so you've got to know that piece. But if you're not, these homemade yogurts can be really powerful. Do you have your patients do some of those GAPS [diet] types of things?

Dr. Shelese Pratt 32:34

Yes. But the majority of my patients have sulfur intolerance and histamine intolerance.

Dr. Jill 32:40

I know, right? Me too, so then no yogurt.

Dr. Shelese Pratt 32:43

They're so happy when I run this test because this test finally validates what they've been feeling, and I'll show you in the markers. I just went over this test with another patient—not this patient but another patient—two days ago, and they said, "What

can I do?—because I am so histamine sensitive and sulfur sensitive." We picked it apart—bamboo shoots. We're looking for a prebiotic. There are some prebiotics out there that are not made from corn or milk. Microbiome Labs, which is an easy choice, has corn and dairy in it. But switching to dandelion-chicory tea or eating dandelions [can be an alternative]. Again, we have to watch the oxalate content for some of our patients with histamine issues. But it's [about] opportunity; we're just trying to get different things through to feed these wonderful bacteria that we want to thrive.

Dr. Jill 33:51

I want to emphasize something else that you're saying here without saying it flat out because you and I have patients all the time [who tell us]: "I can't do oxalates"; "I can't do salicylates"; "I can't do histamine"; "I can't do grains." I love that you're saying this because so often I get on my blog or somewhere [and someone writes]: "Well, I thought we weren't supposed to eat mushrooms." I'm always like, "No, it's individualized." So, I want to emphasize a little bit what you're saying: Part of why people see you and me is because every diet is different. Even if I say what I eat, it's not a classic paleo [diet]. I have some things I can eat. I eat quinoa, but I can't eat X, Y, or Z, so it's very individualized. This is the kind of testing that can tell you how to help your patients be so individualized because it's complex, isn't it? There's no one size that fits all.

Dr. Shelese Pratt 34:39

There is not. The more that I dive into the microbiome, there are things that you can tolerate today that you maybe couldn't tolerate two years from now, and there may be things that you can tolerate tomorrow. It's surprising. You may tolerate a high sulfur food like bok choy or arugula, but maybe we need to limit the amount of Brussels sprouts. A lot of times I see people that are really sick and they get afraid of things. What I want to do is rework that mind to broaden and know that a little bit here and there might be actually good for us unless we see markers on this test that I say, "Okay, really, we need to avoid those for a little while." But we can't stay away from sulfur in our foods forever, right, Jill?

Dr. Jill 35:35

I completely agree! I love that you're saying this because so many people get into these boxes of, "I can eat eight foods and that's it." Guess what that does? That starves your microbiome. We're trying to get [some] diversity here. If you stay on a diet for 20 years, your microbiome is going to shrink to [the point of] not [being] diverse. So, I love that you're saying that because I think that's so important. People get afraid, and rightfully so, because they've been hurt by foods [and] don't feel well.

But you and I are saying what we want to do is heal the root problem and get your diet expanded, not contracted.

Dr. Shelese Pratt 36:03

Exactly. This particular patient, you're going to see they thought they were histamine sensitive; they thought that they could never have sulfur foods. I won't skip ahead, but the bigger problem was lactate. Look at how high their lactate is. That's incredibly inflammatory for that GI. We can convert it. If we can convert it into something useful, we just have to have the right producers [and] utilizers. The big one for lactate, Jill—I don't know if you tell your patients this—is deep breathing. They need to lose the stress. They need to calm down.

Dr. Jill 36:41

That makes so much sense.

Dr. Shelese Pratt 36:43

So part of this is not necessarily just in what they eat; it's also in taking a deeper breath and [working on] stress management to bring down lactate.

Dr. Jill 36:51

I love it. Yes, when you blow off CO₂, you're blowing off lactic acid, right?

Dr. Shelese Pratt 36:55

Yes, which is taking your overall lactate down in the blood, specifically. But this person has it everywhere. There are things that can bring down lactate. Eating some of these higher-fiber foods also helps. But this particular patient, if you look at the type of bacteria that they need in order to reduce this lactate, they've got a ton of it; it's almost like their body knows and it's trying to keep up, but the stress needs to come down.

Dr. Jill 37:32

Yes, that makes sense. I love that you're bringing that up too because we can talk about probiotics and foods and stuff, but if we're not addressing sleep and stress and mind-body [health] and hiking and nature or whatever, those things are critical too.

Dr. Shelese Pratt 37:44

I tell people all the time that the terpenes and antioxidants that you get in nature far outweigh anything I can give you. Anytime we can get access to nature, it will reduce our stress. Exercise—all of these types of things help the microbiome in ways [for which] there's no other answer. So again, this person was trying to avoid all sulfur-[containing] foods; they were basically thinking that they also had ammonia problems, but look at this test. When it does show up, man, we have to change it. One of the things I will say if you have high ammonia—which the next organic acid test didn't [show] high ammonia, so I want to say it now—is that you need to help with protein breakdown. You need to either take bitters [or] apple cider vinegar before your meals, or you need to do some kind of lemon juice if you're not histamine sensitive, to try to get the digestion of protein to work better for ammonia production. Would you add anything to that, Jill?

Dr. Jill 38:59

I totally agree. And on the other kinds of stool tests we talked about, sometimes you see protein in the stool, and that's another sign, or organic acids, and you can see some of these things as well. There are multiple places you can see them, but I would totally agree. I've heard that NAC and magnesium can also help with the metabolism of excess ammonia. Ammonia, literally, is a neurotoxin, so people with really bad, excess ammonia can often have some pretty bad neurological issues.

Dr. Shelese Pratt 39:26

The patient I saw yesterday, we went over hers, and her ammonia was very, very high. It's causing brain fog—severe brain fog. But it's not [due to] the histamine [as] she thought.

Dr. Jill 39:38

Yes, I love that, because, again, like you said, the patient may think it's one thing, but it's actually more complex than that.

Dr. Shelese Pratt 39:45

Right. If you have very high hydrogen sulfite—let's just say this really quick because this particular patient doesn't—you might try maybe two weeks off of high sulfite foods [such as] the cruciferous vegetables, leeks, onions, garlic, eggs, [and] even your high sulfur supplements.

Dr. Jill 40:09

Supplements, right? Glutathione, DMSA, NAC, and what else?

Dr. Shelese Pratt 40:14

MSM. All of these are going to also influence that. You really want to take a break from those supplements as well when you see that.

Dr. Jill 40:27

One other little tip with sulfur/sulfites—because I know this personally—malebdinin can help you process that. I know you use it as well. I'll tell you that for me personally, I had lots of pain when I had excess sulfur. As soon as I did the molybdenum, it was like a pain pill, [although] it wasn't a pain pill, but it took care of that sulfur that was causing the pain. Now I'm fine because I've done the work. I can take NAC; I can take glutathione; I can do those things, but I still take a little bit of molybdenum. That's a huge factor there, isn't it?

Dr. Shelese Pratt 40:53

Oh, thank you so much for bringing that up, because yes, if you actually look at how sulfation works, one of the rate-limiting factors is [having] enough molybdenum to actually go through the sulfur pathway. Anyone with a sulfur issue is going to benefit from taking molybdenum. There are some great options out there. You don't have to take 500 micrograms at once. You can take 25 micrograms in drops or as a pill. There are lots of offerings from different supplement companies.

Dr. Jill 41:26

I know about the caps, but what about the drops? Do you have a company that you like for that?

Dr. Shelese Pratt 41:29

Yes, Seeking Health has something called... What's it called? I think it's SulfiteX. It is molybdenum, and it's only 25 micrograms.

Dr. Jill 41:42

Brilliant!

Dr. Shelese Pratt 41:44

Yes. As you see, this patient had been categorized as SIBO over and over. I'm not saying that they probably don't have some of the bacterial overgrowths in the

wrong area, but this test didn't show methane producers, and it didn't show high hydrogen sulfite, so I'm trying to work this gentleman's brain around: We can sample more of those foods; we have data. Do all these people know how much [of a difference] the microbiome makes to your neurochemistry? GABA is really low in this individual; glutathione production is low. Here's the histamine, because that's actually considered a neurotransmitter. Indole is low. Helping [to increase] the diversity of the microbiome, the keystone species, feeding them what they like to eat, focusing on stress—all of these things will help right this ship.

Dr. Jill 42:47

I want to mention histamine too. I love that you said that it's a neurotransmitter; it is. People are all afraid of histamine. "Histamine is bad." "Mast cell—bad," right? Histamine makes us smart and sharp, so you don't want [to have] no histamine. There are actually studies with IQ levels and histamine levels, and they correlate. Histamine is not all bad. I love to frame that because people think, "Oh my gosh, I shouldn't have any histamine." You want some, or you won't be able to think straight, but you don't want too much.

Dr. Shelese Pratt 43:15

Exactly. Sometimes I think histamine gets blamed for a lot of things these days because mast cell activation has become such a stamp on so many people that are in our space. Sometimes I try to wiggle them out of that a little bit to show them: "No, ammonia is here." "We've got," maybe, "some hydrogen sulfite." "We've got a lot of lactate in your gut." We've got other fish to fry here; we can't just blame histamine. This also checks for estrogen phase 3 detoxification, which I love, love, love because I will run a Dutch for the first two, but knowing how phase 3 is operating—whether they need to keep that conjugation or they're unconjugating their estrogen—this helps us see that, and this is a good test to see it. That is not happening with this individual. But their B-vitamin synthesis is very low. B1, B2, B5, B6, [and] B7—they're all over the map but mostly low. B9, B12—this person has a very hard time managing. They also have FUT2, which is a genetic SNP. They are homozygous, so their ability to absorb B12 is impacted by Bifidobacterium being low, and you can see it.

Dr. Jill 44:43

[inaudible], those are methylated, so it's different.

Dr. Shelese Pratt 44:47

Yes. They're not methylating well in their gut; they're not methylating well anywhere. So [for] this patient, we have a lot of work to do with methylation. But we are going to supplement some of these B vitamins because they're too low. The microbiome is not making enough. The good news is that [vitamin] K2 looks great here.

Dr. Jill 45:12

Yes. So, heart and exercise and all those good things for—

Dr. Shelese Pratt 45:16

Exactly. And [vitamin] D—how they're metabolizing their [vitamin] D despite [the fact that] this person has VDR SNPs and BCMO, which is a vitamin A SNP. So again, those fat-soluble vitamins [and] minerals are the first to go when you have a leaky gut and when you don't have the right environment. It's something that, when we look at a microbiome test, if we see a lot of leaky gut or a lot of inflammation, Jill, we oftentimes will say we need to support, especially if we know you have genetic SNPs [and] you're not getting enough of your fat-soluble vitamins.

Dr. Jill 45:56

Absolutely. In fact, that's one thing I say. Say you're just doing serum labs, and that's all you can start with, something through insurance, and you get [tested for vitamins] K, A, D, [and] E—those are fat-soluble—B12, ferritin, [and] some of these things. Not all of those can indicate [a problem], but many of those are malabsorption symptoms. If you have all of these fat-soluble, B12, [and] iron issues, often there's a gut issue.

Dr. Shelese Pratt 45:18

Yes, and a gallbladder issue.

Dr. Jill 46:22

Yes.

Dr. Shelese Pratt 46:24

This wraps up that BiomeFx [lab result]. I really am a huge fan of this microbiome test, and I can't say that I felt as excited about some of the other ones.

Dr. Jill 46:37

I totally agree. And I'm going to try to do this for those listeners. I believe that you can order this directly as a consumer. If I can get a link for that, I will add that to wherever you're watching this. I'm not going to promise, but after I'm done recording, I'm going to see what I can find because I think you can order this directly as a consumer.

Dr. Shelese Pratt 46:53

I think you can. [Regarding the] BiomeFx [test], to do the real work in between, you really don't need to run that as often—maybe twice a year at most, maybe once a year—if you're working on it and making progress. This is not a test you run every three months—that BiomeFx [test]. Now, this test, you could run every three months—this organic acid test—because this is showing your phenotype. How are your genes expressing themselves? I happen to be a biochemistry nerd. I really like this kind of stuff. And, Jill—

Dr. Jill 47:29

You and I, for fun, on the weekends, we talk about this.

Dr. Shelese Pratt 47:33

We do. We're nerdy in a coffee shop, and if people overheard us, they'd be like: "Wow, they just don't stop! They just never stop."

Dr. Jill 47:40

And I was just going to say, Shelese, that this is one reason why it's so amazing to have a friend like you, and we have multiple of them in our circle. We get a high and are in a joyful place if we're talking about the microbiome and how to help our patients.

Dr. Shelese Pratt 47:53

Exactly. We benefit from one another because we all have different pieces that we all bring, and it's really beautiful. This particular gentleman, this is not my patient; this is Jill's patient. It sounds like, from what I understand, [he's had] exposure to mycotoxins, loves a pretty high-carb diet, and has sweet cravings, which I can see right here on this first page. What else? Fill us in. [He] has intermittent diarrhea [and] exposure to probiotics.

Dr. Jill 48:29

[He] definitely [has] the carb cravings and the mold exposure, which we can see. You can explain why we see that. [It's] interesting; we'll talk later about clostridia, but I think that can manifest as dopamine-driven activities. He likes adventure and those kinds of things. Also, he can be incredibly, intensely focused. I think somewhere in there it can relate to the gut microbiome too—surprise, surprise! [He] generally [is in a] good mood. I think that we see behaviors that try to increase serotonin, as we were talking about before when we reviewed this. If you [have a] craving at night, like after dinner, [and] you need something sweet, you want to go get a cashew or ice cream, or you want to have a little chocolate, that's often a behavior because those carbs will increase your serotonin. If you're really wanting to make more serotonin and you're not naturally making that, you'll often have those [cravings] like, "I need some carbs," or you'll feel a little down or a little discouraged or not great if you don't have enough carbs in your diet. Any other comments on that serotonin-seeking behavior?—because I bet a lot of people listening can relate to that.

Dr. Shelese Pratt 49:29

Well, he is homozygous. He's a fast metabolizer of serotonin, so he's looking for serotonin. It would only increase the likelihood of having a fungal overgrowth. Fungus really messes with our serotonin. I don't know, Jill, if you find this in your practice, but anytime I'm treating fungus and pulling people off of eating so many carbs, I usually have to supplement with 5-HTP and B6 to help their serotonin. Otherwise, they feel like: "I can't do this. This is way too hard."

Dr. Jill 50:04

How about this? You mentioned B6. [He] can't recall dreams—that's another interesting thing, and that would deal with this as well because the B6 is probably low and being used up by those fungal metabolites and stuff. Dream recall is often related to serotonin and melatonin and their metabolites, and also to B6, right? Is there any other thing with poor dream recall?

Dr. Shelese Pratt 50:26

Magnesium [and] zinc, probably. But you're going to see in his neurochemistry that there are definitely things afoot. Before I get going here too, there's no part of this test to say, but he does have HLA-DQ SNPs. He has a heterozygous SNP. He really shouldn't be eating gluten. He's got BCMO-1, so vitamin A deficiency is probably common for him. Looking for that 'chicken skin,' those bumps on the back of the arms or bumps that get on an adult or child's cheeks, [those are] often [a sign of] a

vitamin A deficiency. Again, we don't want to overload the system. This is a fat-soluble vitamin that can damage the liver if it gets too high, but many, many people have an SNP here and don't absorb it well, to begin with. I believe this particular gentleman probably has a gallbladder issue as well because of the mycotoxin exposure. Now we'll get to this test. He is colonized by four fungal species—probably different species. These are metabolites.

Dr. Jill 51:39

[inaudible] exposure was to *Aspergillus* and *Penicillium*, among others. [Also], the furans [according to] that number, right? I want to talk about oxalates too because, [with] tender tissues, he mentioned getting a massage, and it was so painful he hated it. That can be oxalates in the tissues, right? We see the fungal metabolites contributing to oxalates. When you show the next page, eventually there's a load of oxalates, so I want to talk about oxalates as well.

Dr. Shelese Pratt 52:04

He has genes that make him AGXT; he's homozygous, [so] it's harder for him to manage oxalates with genetics. But again, just because he has that SNP does not set him up so that he couldn't have kale or these things. It was also bringing in this exposure to fungus, which creates even more of a tidal wave of oxalates.

Dr. Jill 52:30

For our listeners who are like: "Okay, oxalates, do I have them? What's the issue?" Tell us a little bit about what you would see in a patient who had oxalate issues [in terms of] symptoms and stuff.

Dr. Shelese Pratt 52:41

Pain—pain in their body. Just in general, pain. Vulvodynia pain [can also occur] in that area of a woman's body. What else? Kidney stones...

Dr. Jill 52:54

Yes, bladder.

Dr. Shelese Pratt 52:54

... that's the most obvious one. I tend to [be] like, "Oh yes, kidney stones," because that's so obvious. That was how we learned about oxalates—Jill and I—probably in

medical school. Glyphosate increases oxalates, so the more glyphosate you're getting, you're getting more oxalate issues as well—to bring in that piece.

Dr. Jill 53:17

I think at the same time you did this test, the glyphosate was giving me an 80th percentile, so pretty high, which makes sense.

Dr. Shelese Pratt 53:25

We can't just blame high-oxalate foods. I'm constantly telling people that it's not just the food. Usually, going on a low-oxalate diet will cause a massive oxalate dump, which then [makes them] feel awful. The whole point is actually to manage the fungus, diversify the diet, and reduce the infection that's causing this.

Dr. Jill 53:49

Absolutely. I love that you said that because so many people are like, "Oh, low oxalates." Again, if you went from 100% oxalates to 50% or 20%, you're going to dump and feel horrendous. We recommend a 5% or 10% reduction, if anything. And then, like you said, the big factor is that you have to go to the root, which is the fungal overgrowth in this case.

Dr. Shelese Pratt 54:07

He's colonized. You see that these are pretty tartaric. It's supposed to be under 5.3, but he's at 39. Arabinose at 72—I would expect it, actually, to be a little worse, craving cashew ice cream and sweets as much as he does. I can see he's trying to keep ahead of this. But he's got some serious fungus here. But his bacterial markers are also very high, and Clostridium is causing some issues here, so there's definitely a microbiome piece to this. Before we jumped on today, we had talked about some of these results before. I think this person should probably increase those fibers that we talked about to help scrub the GI and help bind some of the mycotoxins. Can this person take binders, Jill? Can they do activated charcoal?

Dr. Jill 55:06

He's currently on charcoal every day, so that's great, yes. You mentioned Saccharomyces boulardii earlier; I think that's a good idea. I'm trying to think—what else? He does take a little NAC and charcoal. Probiotics, so far, he has not tolerated, so we'll have to figure out a way to get those in.

Dr. Shelese Pratt 55:25

But could we consider an eighth of a cap of *Saccharomyces boulardii*?

Dr. Jill 55:31

Yes, absolutely. I think this is [inaudible].

Dr. Shelese Pratt 55:35

Or, an eighth of a capsule of MegaSporeBiotic, or an eighth of a capsule of HU58, which is the bacillus species. Again, a lot of people can't do a whole cap, so sometimes we have to open them up and just sprinkle. It's like a dusting. Actually, that is a way that you can slowly shift. I think I'm quoted in your book as saying...

Dr. Jill 56:01

Yes, you are! You absolutely are.

Dr. Shelese Pratt 56:03

... "Sometimes we don't have to do things in a massive way; sometimes it can just be a little bit." It can be a delicate—

Dr. Jill 56:08

You're quoted. Sometimes you can be a delicate flower and a badass.

Dr. Shelese Pratt 56:13

That's right. You're a badass even in the moments when you're delicate. So anyway, I think clostridium is a big piece here, and *Saccharomyces boulardii*, if we can do that, it goes after the fungus, helps the bacteria, and it also helps clostridia species, which we saw on a GI map and was also an issue.

Dr. Jill 56:39

If you're live with us I had someone who's on live just said: "Hey, my stool didn't have yeast, but I have tons of oxalates. What else could I do?" I actually mentioned this test. This is called the Great Plains OAT test. This is a great test. It's the one. I just responded to you, if you're listening out there still. This is a really good test. And what I find, Shelese, and I'd love to know your opinion, [is that] the stool doesn't always pick up what's in the small bowel; in fact, it rarely does. If you're doing a stool test, you may not see the fungus or the yeast as much as you would on

[an] organic acid [test]. This is a urine test that looks for metabolites in the body, so you almost need both sides to diagnose it.

Dr. Shelese Pratt 57:14

One-hundred percent. Thank you so much for pointing that out. It's also one of the reasons why it's nice to see these back-to-back. I wish they were the same patient, but they are not; they're two different patients. But oftentimes, you can't find fungus even on the BiomeFx [test]. It's really amazing at hiding the biofilm that it creates. The organic acid [test] picks up on the metabolites, not the fungus itself or the DNA of the fungus; it's looking at what it produces. We see that time and time again, where we can actually get to it or see it. Right, Jill?

Dr. Jill 57:53

I totally agree with you. I always do stools; I always do organic acids and serums. That's the one-two-three punch for every new patient.

Dr. Shelese Pratt 58:00

Again, this is not this patient, but a different patient who has actually seen both of us and was concerned that they had fungal issues. They said every time they came home, they thought it was the mycotoxins that were in their house. We found, actually, that it wasn't the fungus because their OAT looked beautiful. They were so frustrated because they kept treating it as if it were fungal. And guess what? It was hydrogen sulfite. It was the fact that every time they went home, they ate a ton of cruciferous vegetables, and when they were out traveling, they just didn't have access to that amount of cruciferous vegetables. They'd feel bad every time they came home, and it wasn't actually fungus anymore. So, anyway, that's a side note. These two tests can really help a doctor see a lot of different perspectives so that we don't keep banging on the same door.

Dr. Jill 58:58

I love that you mentioned cruciferous vegetables, [which are] some of the healthiest things in the world—leafy greens. But if you don't know that you have oxalates... For example, this patient that we're talking about now drinks fresh green juice all the time, and that's wonderful. He literally makes his own green juice, but he's high in oxalates, as you can see here, number 21; it's off the charts. So green juice, if it has the wrong components and is high in oxalate, may not be the best thing every single day for him.

Dr. Shelese Pratt 59:23

Again, I would say green juice, but specifically low-oxalate greens, right? Endive, watercress, parsley, cilantro—I'd put a green apple in there and some lemon and fennel, and those are all low in oxalates, I believe.

Dr. Jill 59:43

Brilliant! I love it. So, you can still do it, just not [with] your kale and your spinach, maybe.

Dr. Shelese Pratt 59:47

I think if you google 'Dr. Pratt's spring smoothie,' I think that's the one that comes up. Sometimes I put avocado in it as well if they don't have a histamine issue.

Dr. Jill 59:55

I want to share that link. Can you send that to me? Everywhere you're listening to this, I will be sure and share your link.

Dr. Shelese Pratt 1:00:00

I know my website is a little [inaudible] today; it's going to be fixed on Monday. But I think you can get to that if you put that in. Anyway, oxalates are definitely an issue here. But do I want to put them on a low-oxalate diet? No, that would make him worse right now. What I want to do is what we talked about: I want to go after the fungus and help the microbiome. I want to reduce oxalates but not take them out completely. So, then, we get to mitochondrial markers, and his lactic and pyruvic [levels] look pretty good to me. Would you say the same?

Dr. Jill 1:00:35

Yes, I agree.

Dr. Shelese Pratt 1:00:36

And then we get to succinate. Succinate is in the Krebs cycle. At the midway point of the Krebs cycle is succinate. He either has more issues getting to succinate and some of the cofactors needed; it could be heavy metals slowing this down, [or] it could be pesticides, mold, [or] toxins—what I'm saying—really influence succinic acid. If this were my patient, I probably would want to run a tri-test. I'd also want to run a GPL-TOX, which I think you might have actually done.

Dr. Jill 1:01:16

I do. And while you're getting it, I can pull that and tell you if there are any big factors there.

Dr. Shelese Pratt 1:01:20

Okay. But either way, this is telling me that there's some significant damage happening to the mitochondria, which brings me back to his genes. He has several genes, one of which is MTHFR homozygous C677. Now, everybody needs to understand that doesn't necessarily mean something bad, but in a case where I see a lot of oxidative stress, I'm thinking, "Oh well, he does have a homozygous C677, and that is slowing down his ability to detox. He also has CAT, which is heterozygous [and] very inflammatory. He's prone to inflammation and oxidative stress. These toxins are influencing and turning these genes on. He also has BHMT; the more oxidative stress he gets, the more it can mess up his glutamate to GABA [conversion] and his ability to manage his glutamate. Let's see. ATM heterozygous is more. The more he's exposed to oxidative stress, [the more] that's influencing that gene. PEMT—the more he has gallbladder issues... He's prone to them; he's prone to fatty liver disease because of this PEMT.

Dr. Jill 1:02:47

He would do good on choline, right?

Dr. Shelese Pratt 1:02:50

Some choline might be helpful with methylation and with a fatty liver. But also eating a lower carb diet is pretty important for this individual for the risk factors that they have. But FUT2, again, he's homozygous as well, so he's low in those lactobacillus species, and eventually, we probably need to pepper that [in with] something like ZenBiome Cope. And then, what other? Well, BCM01, if you don't have enough vitamin A, that creates more oxidative stress as well. I'm just looking out for the mitochondria, saying: "Okay, there are genes at play here. The more oxidative stress and the more toxins he has," which we know mycotoxins are one of those, all these bacteria are also producing toxins in his microbiome, "we want to protect the mitochondria."

Dr. Jill 1:03:41

[I'll] just [give] a little backstory. I just looked at the other test results. He did a metals unchelated. Tin and nickel were moderately high. So that's interesting; we

could look for sources of that. And then, on the glyphosate, I think I told you it was above 75%. There was only one other toxin that was high, and it was called acrolein, which can be from Clostridium. Now, it can be from [inaudible]. But I'm like, "I wonder if that's from the clostridia in his gut that's actually producing that acrolein," because that's the only one that was really in the 95th percentile for toxins. And then, on the mycotoxin profile, there was very high Chaetomium globosum, which is one of the worst of the worst, and also mycophenolic acid, which is immunosuppressive, probably part of the fungal connection. So those are a little bit of the other pieces.

Dr. Shelese Pratt 1:04:28

So, we're not sure which, or all, or probably the medley of the bucket that that sits in, is making these mitochondria unhappy, but this shows me oxidative stress. Is that what it shows you, Jill?

Dr. Jill 1:04:41

Absolutely. I totally agree. And we have a little CoQ10 on board. Not that that fixes the whole problem, but it actually helps a little—that succinate pathway.

Dr. Shelese Pratt 1:04:51

CoQ10 would help [with] that. B12, magnesium, selenium, might help this a little bit, and folate, which I believe... Is he vegan?

Dr. Jill 1:05:06

Yes.

Dr. Shelese Pratt 1:05:08

Okay. So, we probably need more because [there are] four mitochondrial markers out, and then this number 32 is getting near the end there.

Dr. Jill 1:05:22

So methylated [vitamin] Bs, magnesium, CoQ10, and maybe some changes in diet. We'll look over that.

Dr. Shelese Pratt 1:05:31

And choline—getting back to the choline. Okay, so now we're talking about neurotransmitters. Jill alluded to this or foreshadowed that there's clostridium at play, so it could be driving up his markers. HVA can be influenced by clostridium. He did not have a COMT SNP; I was kind of shocked, like, 'Okay.' So it could be that he's grown accustomed to feeling this much dopamine, which I'd want to weed him down for that because what we know about high dopamine in too long of a state is that it actually works against us after time.

Dr. Jill 1:06:16

And [it causes] damage, doesn't it?

Dr. Shelese Pratt 1:06:17

It causes brain damage [and] cognitive decline. We're seeing this in the gaming community, right? The kids or the adults that game for hours and hours at a time, their neurotransmitters look a little like this too, with or without clostridium at play. I think we talked about this before, or they take quercetin [or a] green tea extract. The last time Jill and I did this Facebook Live, she told me she took five quercetin at one time. If you came up here to meet this patient, you probably would have had a really fun mountain climbing experience or something.

Dr. Jill 1:07:00

That's so funny! I have to tell you the rest of the story. This is like a year or two ago when I had more estrogen and more dopamine. I literally had an allergic reaction, which is also an antihistamine. Like, "Oh, five. If one is good..." I forgot that I was a delicate flower. You know when you get into a car accident, internally, you're totally traumatized and shaking from that adrenaline rush. I'm driving home from work, and I'm like, "Why am I so shaky?" I felt it inside me, this buzzing, and I was like, "Oh, the quercetin. It blocked the breakdown of norepinephrine and epinephrine." I was in this total adrenaline state; it felt horrible. It wasn't good. But what's funny now, Dr. Pratt, is I usually take one a day—because I'm lower in neurotransmitters; the adrenals are way lower now; the estrogen is lower—[and] it actually helps. You can use it at certain times in your lives.

Dr. Shelese Pratt 1:07:50

It's all about balance, right? This person probably should not take quercetin right now. But what I don't like—what I really don't like—is the quinolinic acid. That is a neurotoxin. It means that he's stressed enough and B6 deficient. It will also cause you to fall back from making serotonin, which he's looking for in malA and malB; he really wants serotonin, but instead, he's taking that tryptophan and tipping back

into the kynurenine IDO1. And he's making kynurenic [acid], number 40 [on the slide]. See, that's pretty high. But the quinolinic acid is way too high, and that is a neurotoxin.

Dr. Jill 1:08:33

Yes. That's the only one on this whole test that you see that high. I want to just emphasize that that's my most scary [one]. I do not like that one because that literally burns out the neurons, if we could say that in a generic way.

Dr. Shelese Pratt 1:08:45

Yes. And it can cause irreversible damage if it stays high for a very long time. For all my kids on stimulants or adults on stimulants, I run an organic acid [test] to check quinolinic acid regularly on them to make sure we're not tipping into this. When I see this, the first thing I want to do is give them glutathione, magnesium, [and vitamin] B6 to help that quinolinic acid break down. All right, but I will say, shockingly, this patient doesn't look like they're deficient in glutathione. But again, you said another marker showed you that Clostridium was at play. I think this is driven by clostridium and bacterial overgrowth.

Dr. Jill 1:09:34

I'd love [to hear] your thoughts on this; you can obviously do heavy-hitter medications like metronidazole, vancomycin, or the new Difcid, but I don't like to go that direction. I will say there are some studies in children with pulse-dosed vanco[mycin]—you can use that. In this patient, we're using black cumin seed; he can't tolerate a lot, but he takes a little bit every day. Any thoughts on other ways to help that clostridium besides all the stuff we've already talked about?

Dr. Shelese Pratt 1:10:02

No. I keep wanting to go back to just a little bit of Bacillus, a little bit of spore-based Bacillus, and a little bit of Saccharomyces.

Dr. Jill 1:10:13

I agree. We're going to try that next.

Dr. Shelese Pratt 1:10:17

But just a little, and then we build up to a fourth of a cap. And then I'd like to work on protein digestion, where he does get protein, and I want him to get more from it.

Bitters would be a fantastic addition to help that gallbladder and vagus nerve to help reduce stress, but [they would] also help break down proteins, [including] the proteins that he is getting from his vegan diet. So those were the cases.

Dr. Jill 1:10:46

Wow! We just did a huge whirlwind, a deep dive like you normally do. If you're listening out there, I hope you enjoyed this. If you have that BiomeFx [link, that would be great] so you can get that or the organic acids [test], you can come back and listen to this. As you have your test [results in hand], you can walk through alongside what we just talked about and maybe get some things out of this talk. We went deep diving like we would with a patient. Dr. Pratt, this is so fun, and you're so full of knowledge. I'm so grateful—not only for your wisdom but [also] that I get to call you a friend. What a blessing!

Dr. Shelese Pratt 1:11:16

We have to bring up our other friend, who wrote a book on the microbiome for kids.

Dr. Jill 1:11:24

Take your screen down so you can see that. I want people to be able to see that nice and big. There we go.

Dr. Jill 1:11:28

Yes, so Sarah Morgan, a dear friend of Dr. Carnahan's and mine, wrote this amazing book for children to help them understand kind of what we talked about today, right, Jill? It's Christmas time; maybe get them a copy of *Buddies in My Belly*. It's a great book.

Dr. Jill 1:11:46

I'll put a link there so you can get *Buddies in Your Belly*. Again, [she's a] great friend of ours, but what we loved is that she brought such an entertaining story because you want to teach your kids and have them start eating some of these foods, like the prebiotic foods and the fibers and stuff. You can start them really young, and they'll be your best helper. I have a close friend who works in my office who feeds her kids, and she's like, "Okay kids," and they can't wait; they run into the kitchen to get their probiotics and their stuff, and it's liquid, so they take it on a spoon. She sent me a video the other day; it was awesome because I was like, "Oh, my goodness, this is so great!" because the kids are like, "Mom, mom! Can we have a

treat?" It's the medicine; it's the probiotic; it's the good stuff. You can teach your kids [from a very] young [age] to start doing these things. Awesome—we just dove right in, and it was great. Leave your questions here; go back and watch the other one we did on EMFs. Dr. Pratt, thank you. Let's leave one takeaway [point]. What would be one takeaway point people can have for practicality?

Dr. Shelese Pratt 1:12:42

Increase the fiber in your diet. Feed your bacteria what they want to eat, [such as] a green banana; if you can't do that, chicory and dandelion tea; if you can't do that, bamboo shoots or jicama. Some of these things can shift your microbiome within days if you start to eat more fiber.

Dr. Jill 1:13:04

I love that. Jicama is my new favorite. I'll chop it up and put it in salads [with] walnuts, a little strawberry, and jicama. You can throw these things into foods; you don't have to eat a whole jicama. I love that. Thank you again for all your time today and your expertise!

Dr. Shelese Pratt 1:13:19

Oh, it was lovely to be here, and it's always fun to share time with you, Jill!