Introduction and pediatric gut-brain health

Welcome back to another interview on reversing chronic gut conditions. I'm your host, Sinclair Kennally, and today I am joined by my wonderful friend and very esteemed colleague, Dr.

Elisa Song. She is a pediatric specialist and she's one of my favorite voices on what is happening to our kids in this generation right now. Where have we gone off track as a culture and how our kids experiencing that?

What are those early symptoms that kiddos are under distress and what can we do about it? From a holistic perspective? And one of my favorite reasons to have her on these events is because she spreads such a message of hope.

She's always got cutting edge data to share, and yet she's really encouraging to parents and really helps us keep everything in perspective and look at practical steps for moving forward.

So I'm so delighted to share her work with you today. Welcome, Elisa. Okay, Sinclair, I'm so honored to be here. For the second year in a row for the reverse chronic condition summit.

So let me dove right in. I have slides. And so for listeners, what I'll be talking about today is healing the gut brain connection in pediatric nurse psychiatric condition.

Because nowadays, let's face it, our kids are really facing an epidemic of mental health concerns. The pandemic has shined a really glaring light on the need to really, once and for all, address this.

And I hope that this message doesn't get forgotten. So let you share my screen and get to a slide show. All right. So let's talk about the brain connection in your kids.

And this is going to be relevant for you if you have a child with any mental health concern, whether it's a little anxiousness or an actual anxiety disorder, whether it is Pans or Panda or OCD or ADHD or autism, anything related to the brain.

We're going to talk about how that's related to their guts and a similar said with practical tools, because I'm a mom too, and I want to walk away with actionable items.

All right. So these are my two kids who thankfully, knock on wood, are super healthy and are my best teachers every day. And are my guide for really how to explain to kids.

What's going on, too, is super important because I want our kids to understand how to help themselves as they get older. Sinclair is going to have this and who I am, but I really my goal is to empower parents and practitioners to see that there's a different way to address whole child wellness and kids to understand what true resilience is in kids using an integrated pediatric approach.

And, of course, just as a disclaimer for informational purposes, and I want to make sure that you guys, your kids get the help that they need. So this is a starting point.

We know that there has been a skyrocketing increase in the rates of autism and neurodiversity. And when we think about neurodiversity versus being neurotypical, my question nowadays is, well, who's neurotypical?

I mean, we all have probably a touch of nerd diversity. And so we want to embrace that, embrace the gift, but also recognize that kids who are nerd diverse have a lot of challenges that they are trying to overcome.

And we want to make life as as functional and optimal for them as possible. Now, these numbers from the CDC in 2023 just came out this year that one in 36 children now has been diagnosed with autism spectrum disorder.

That is up from one in 44 in 2018. It's not just a matter of recognizing and getting more diagnosed diagnoses. You know, as a parent, for me, it is alarming to me being in the kids classrooms, my my kids school, they've heard a lot about your work and love being in classrooms, but you have to see the number of kids who just can't be still in their bodies because in their brains to be alert and aware and happy and focused is really it's it's heartbreaking at times.

Autism is four times more common among boys and girls. And we know that states have different discrepancies in the rates of autism. In California, where I live right now and work, one in 22 kids are diagnosed with autism in Maryland.

That's a little less than we have to look at. What are the environmental factors? What's going on here?

Rising rates of autism, ADHD, and youth mental health

We also know that ADHD is on the rise and these are this is older data. We don't have as much up to date data on the rates of ADHD in children, but we know that many adults are now being diagnosed with ADHD that was unrecognized when they were children because they managed to get by.

Right. The average age of ADHD diagnosis is about six, a little over six years of age and co-morbidities are very, very common. Your child with ADHD one and two is also going to have a behavioral or conduct disorder.

Three of ten, one third are going to also have an anxiety disorder so they don't come alone. And then other mental disorders, we know the pandemic has really shine the light on this mental health emergency in our children, also in our adults, increased rates of suicide visits for suicidal ideation and attempts, very sadly, for our youth, our teenagers and young adults.

Suicide is the second leading cause of death in that thousands and thousands range. The first is accidental injury, which is often tied to mental health concerns.

The third is homicide. Way, way, way, way down are infectious diseases, right? So we just need to really understand where are placing our public health priorities.

Now, one in four teenagers is diagnosed with an anxiety disorder. It's a lot higher in teenage girls. By the time teenagers are 18, almost one in two are going to be diagnosed with any mental disorder.

So we need to really look at this seriously and take a look at what has been previously relegated to. Oh, that's that's like that's psychiatric medicine.

That's all in your brain and in your head. Now, let's talk about panda pandas briefly. So many of you are familiar with pans and pandas is pediatric acute onset neuropsychiatric syndromes.

At least these are older numbers. At least one in 200 US children has pandas. Probably more that are being undiagnosed or underdiagnosed because they're not meeting.

That said, an acute you know, they get a step infection and overnight like Jekyll and Hyde they are OCD anxious can't leave the room aggressive tics stop eating.

So that's in the more severe cases where we see children and hear about children who are hospitalized with psychotic episodes. But the vast majority have a slower, more subtle onset where, okay, something happened.

Maybe they had a flu like illness or maybe they had COVID, maybe they had strep and it's not sudden, but something changed. And as a parent, you know, they're different.

Right. We're going to talk about post-COVID, mis-c, multisystem inflammatory syndrome in children, all of this and my somebody early on in the days of the pandemic, in March of 2020, when we had no idea what the heck was going on.

We had no idea how kids are being affected. Right. I could even get a swab to check my daughter to see if she could because I was waiting for requests to send me these that were backward or at my developed fever cough this year, low oxygen saturation and very, very strange neuropsychiatric symptoms.

This eye rolling tick, this goofiness suddenly mad and angry and and then suddenly goofy and kind of spacey. It scared the bejesus out of me. Right. And this is me having treated many kids with cancer.

I'm like, what? It looks like parents, right? Fortunately, I knew how to help him out of that. And he's thriving now. No evidence of any pans, but parents many parents are not as lucky to have a practitioner who is as familiar, which is why I'm so glad you're listening to the summit hosted by Sinclair and getting informed.

Some kids are diagnosed first. In fact, the majority of kids with parents are diagnosed with other mental health conditions before they are appropriately diagnosed.

pans and pandas. One in four kids with OCD and tick disorders like to rest and they actually have pandas underlying. And I have some resources here for you if you want to pause and just listen to some of the more in-depth interviews I've done, specifically on PANS and PANDAS.

Now, PANS and PANDAS, PANS can be triggered by infections like strep. What patterns is triggered by strep? It's called PANDAS. Okay. There are other infections that can trigger pants.

There are other noninfectious triggers. So this diagram just gives you a little bit of a snapshot. Here is the umbrella term pediatric acute onset neuropsychiatric syndromes can be triggered by infections.

So we know that strep can do this, in which case it's called pandas, pediatric acute neuropsychiatric disorders associated with strep. Okay. You can see why we shortened it right to pandas.

But then there are many, many other infections. And I wrote this slide before COVID, before the pandemic. So we should put COVID in here. But Lyme, herpes infections, Epstein-Barr mycoplasma.

And then there are noninfectious triggers and sinkers all about teaching us how to live toxin free and identify toxins that the root cause of our illnesses and environmental toxins, molds, heavy metals.

All of those can also be patterns, triggers, or at least pants, perpetuators. It may not be the straw that broke the camel's back and triggered your child over into pants.

But if there's mold, if there's toxins, it's not going to help your kids get well. Okay. It's just the diagnostic criteria for pants and pants. And what you'll see is abrupt, dramatic.

And as I said, for a lot of kids, it's not so abrupt, not so dramatic. And yet those kids still, even though they might not be admitted to the Stanford PANS Clinic because they're not abrupt enough, not dramatic enough, these are kids who still must be recognized as having brain inflammation induced by infections or other triggers and must be treated in that way in order to really heal.

All right. I've mentioned COVID, so post-COVID in kids. We know that the vast majority of children would do just fine with COVID 19. Rates of long COVID are much lower in children.

And in fact, many, many kids have asymptomatic illness are very mild. In fact, this last winter where flu and RSV and norovirus and all the other things were going around, most of my parents and kids said, Yeah, COVID was a piece of cake compared to the flu I just had or RSV, I'm not making light of COVID.

It can be very serious in children and adults. However, the truth remains that for most children, COVID itself, the acute infection is fairly mild. There are some rare post-COVID complications, including these psychiatric complications.

COVID 19 has been found to be able to trigger pans and so in light of a recent COVID infection and pans like symptoms, physicians need to be alert practitioners.

PANS, PANDAS, and post-COVID neuropsychiatric symptoms

They should be alert to the fact that this actually could be a brain inflammation and set the slightest triggered by COVID and anti neuronal antibodies.

These are autoimmune antibodies against parts of the brain, similar to those found in plants. Patients have also been found in some children post COVID 19 who presented with this neuropsychiatric complex.

And then there's Mis-C. I mentioned multisystem inflammatory syndrome in children, which multisystem means you can also have neuropsychiatric symptoms.

So this is a case definition for mis-c. You have to have there's a fever and many, many systems involved. Now, my child has had GI, neuropsychiatric, skin rashes, respiratory.

I mean, he had all of that, right? So, so he probably would havefit the diagnosis for MIS-C had we even known in March of 2020 what am see was wasn't even identified until out of Italy and London in April made like there's something going on with these kids, right?

It's kind of like Kawasakiand now we know it's MIS-C. All right. So now my question, big question of the day is am I mis-c, autism, ADHD, anxiety? And you can answer really any neuropsychiatric pediatric condition.

Is it a brain problem or is it a gut problem? So let's explore this a little bit and look at what the gut brain connection means, especially for our children.

Now, most of you have heard of the vagus nerve. It's that information superhighway between the gut and the brain. We need to recognize it is a bi directional flow.

Gut communicates to the brain. Brain communicates to the gut. But what most people don't understand is that 80 to 90% of the communication occurs from the gut to the brain.

So then we have to think who's really in charge here? Right. The gut has been referred to as our second brain, but it shouldn't really be called the second brain.

Right. And our gut microbiome, the health of your gut microbiome directly influences your and your child's emotions, moods and behaviors. It's it's a two way street to how we think, feel and behave also affects our gut microbiome.

But the influence is more in the gut to the brain direction. And we know that the vast majority of neurotransmitters are made by our beneficial gut bacteria called probiotics.

Right? These are the good microbes that we want in our gut. We don't want a lot of bad microbes and we want a healthy balance. But serotonin, for instance, our feel good relax manage anxiety helps us fall asleep.

But 80, maybe 90% of all the serotonin in our body is actually made in our gut by shaping whole chews from many other neurotransmitters like dopamine.

Our reward and focus and attention neurotransmitter that can be affected in ADHD and addiction. With serotonin, we know we can have gut conditions like irritable bowel syndrome.

That's why, quote, antidepressants or SSRI medication, serotonin reuptake inhibitors are used for IBS, not because it's just in your head right? It's not real.

It's because serotonin is so important. And of course, we know serotonin and fasting involved in anxiety, depression and OCD, but we have other neurotransmitters like acetylcholine that is involved in brain nerve cell to nerve cell communication and processing, speed and cognitive processing implicated in autism and Alzheimer's.

There's GABA with healthy stress response. There's norepinephrine, which is involved in our fight or flight response. So the gut microbiome really important for our brain functions how our brain feels, thinks and behaves.

And these psycho biotics have been identified. Now, these are the happy, happy bugs. These gut probiotics that strain specific probiotics. And what do I mean by that?

There's a gazillion probiotic supplements market. You want to make sure that the products you're taking have strains that have been clinically studied, validated to be beneficial for the goal you are trying to achieve.

If you are trying to achieve healthier brain and functioning and mood, you're going to be looking at psycho biotic strains that have been proven to support healthy serotonin production.

If you're looking at supporting healthy skin, eczema, acne, you name it, you may be looking at skin strain, specific probiotics. It's not just a matter of throwing as many probiotic strains as you can into your gut.

So psycho biotics in some states have been shown to treat depression, anxiety and other psychological disorders better than medication. Right, in some studies.

So these are just some of the strain specific probiotics, Lactobacillus, Helvetica, Roselle, 52, the bifida blog, Roselle 128. I mean, some of these studies are fascinating, right?

So what happens when the gut microbiome becomes disrupted? Because if you're listening to this, you probably are you may have a child with anxiety or OCD or mental health concern or pans or pandas, or maybe you yourself have a cooperative.

So you've been told that, you see the psychiatrist is nothing to do with your immune system or your gut. Well, your gut microbiome in that case is likely already disrupted.

So we need to understand what's going on there. So when the gut microbiome becomes disrupted, we can develop something called gut dysbiosis and some of these really happy good gut bugs.

We have these dis biotic, not such happy gut bugs that are really not serving us. Oops. We know that gut dysbiosis is associated with children's mental health and adult mental health.

In fact, antibiotic use during the first two years of life was found to possibly increase the risk of mental health concerns later in childhood and adolescence by up to 50%.

Okay, another very large study in Finland. Finland is an amazing country because they have this sort of great controlled population in terms of scientific method of research, and they have these databases that you can you can mine and just get all this amazing data.

So look at 1 million births and looked at antibiotic drug exposure to mothers during pregnancy, which means babies getting it through in utero through the placenta and antibiotic exposure in the first two years of life, there was a 50% increased risk of choosing not to sleep disorders, ADHD, other mood disorders.

The strongest risk occurred when antibiotic exposure was before six months of age. Okay, we see the same thing occur for babies who receive antacid or antibiotic medications in the first six months.

We know that the gut immune system connection and significantly increased risk of every single allergic disease by the time those kids are for eczema, asthma, hay fever or hives.

So as you sit here as a mom and six it in your kids maybe having antibiotics, just know that I'm going to get to where we can actually reverse this process.

Okay. We can heal from this. This is just not to generate fear and guilt, because I know you're going to have that right now. I know my kids. Both of my children. Right.

You as a holistic pediatrician, both of my children had antibiotics in the first two months of their life. And did I want to know but did I know they were necessary?

Yes, right. I also was fortunate to know how to clean up their gut microbiome. But you can do that at any age. Might take a little longer. It might be a little bit more of a journey, but you can do that.

Okay. Several studies have shown altered gut microbiota and gut dysbiosis in patients with all sorts of mental health disorders, children and adults. Now, when the gut microbiome is disrupted, we can also get leaky gut.

So there's two different phenomena here. Almost always come together, gut dysbiosis, abnormal bugs in the gut that you don't want to be back to abnormal bacteria, abnormal yeast, viruses, parasite.

Then you can also have disruption to the small intestine aligning where instead of these really healthy, tight junctions that don't let the things that shouldn't get into your bloodstream through from your gut, we get leaky gut junctions right?

All sorts of not such good things in like pathogenic organisms, bacteria, viruses that shouldn't get in inflammatory foods, environmental toxins. Right.

And we've known about leaky gut in children's health for quite a while.

Understanding the gut-brain connection

And in fact, leaky gut can be associated in the scientific literature with with virtually all chronic children's health concerns, even kind of adult concerns.

This is not a new thing. This article from 2005, I want to point this out. In 2005, we're almost at 20 years from 2005. That's a long time for this to not have reached conventional pediatric medicine.

And I'm not knocking. I was a pediatrician. I was not trained this way in medical school. Right. But this is where we need to have the awareness and have more.

Pediatricians are willing to look at this and say, you know what, maybe I need to look at this for my my patients. Right. My own children. We know that this.

Link that I just have to acknowledge you for a minute, because I think it's so important for any any health practitioner and who's really working their discipline to constantly be in a state of discovery and curiosity about what is the emerging data now, what is the emerging understanding now?

And for the parents listening, I really hope that you are getting empowered by Dr. Elisa's advocacy here to be an advocate for your own kids and to really raise your standards for who you are letting take care of your kids.

Yeah, yeah. And coming at it from a sense of of wonder and discovery and. Wow, okay. I'm going to put aside the guilt that I didn't know this before. Right?

Because I've had those moments where I've looked back and thought, Oh, my gosh, I wish I'd known this when I

saw this X, Y and Z patients. Right? But now, you know, and we want to move forward with like what are the possibilities now for some of the kids who I didn't know back then?

How do we move forward? And then for the child in front of me now, how do we move forward right now so that not more time goes by where they are not getting help that they need?

You have beautifully said. So we can see and I kind of I went through I mean I don't know how many hours it took me to kind of go through a bed, but I was like, I just want to know when did we really know about leaky gut and kids health?

And, you know, permit doesn't go go as far back as I would like but I can find the earliest was 1981 where they found in childhood eczema a link with increased intestinal permeability or leaky gut 1981.

Now we're looking at almost 40 years right now. And so and all the way down through during the pandemic identified is this is research or the pandemic.

But with Hashimoto's in children that obesity and mis-c okay so leaky gut and mis-c let's talk about this is Dr. Alessio Fasano, who's one of the most amazing researchers at Boston, the pediatric gastroenterologist and Zombieland is a protein that's released from leaky gut linings.

It's a marker for leaky gut, also for leaky brain. A lot of other organs released on a limb when they have a leaky illness that they really shouldn't.

So increase your inulin was found in the blood of children with ABC. Remember that rare post-COVID complication? And so this group, Dr. Fasano's group gave this group of children with MIS-C.

And when I'd say MIS-C, some kidswith severe in the ICU, they are on blood pressure medications. They are really, really sick. Okay. And so they give this medicine, La Raza type, which is not commercially available, but it's a medicine that could heal leaky gut.

I mean, how amazing how amazing would that be right before available? But they found in this group of children who were given this experimental medication, a decreased plasma SARS-CoV-2 spike antigen levels.

Okay, so COVID decreased COVID antigens, decreased inflammatory markers and more rapid improved clinical outcomes. So just by healing the leaky gut for these children in ADHD, we found leaky gut.

In fact several studies have found higher levels of Daniel it and occlude in another protein found it to be elevated in leaky gut found in a kids with ADHD and one study fascinating.

The higher the levels of absolument, the more hyperactive and socially impaired the child was right, the leakage of the gut, the worse. And the neuropsychiatric concerns right now, when you have gut dysbiosis, you have the leaky gut.

That's a perfect storm for something called metabolic endotoxin. When you have a particular group of gram negative bacteria down here, I'm sure there are others, but these are known to be and no toxin producing gram negative bacteria.

These are very often if you've ever done a functional analysis, you will often see, Oh, I have some Klebsiella there. I am such a bad actor there. These are also implicated, Proteus.

These are also implicated in autoimmune diseases. Right. Which is why I want to get rid of those if I have any child who is autoimmunity. So these dis biotic organisms produce and the toxins, something called l p s lipopolysaccharide.

There are a lot of words out here, but LPs now what LPs? So you have these despotic bacteria that have LPs on

their cell membranes that then gets released into the gut.

You have a leaky gut. So this LPs now enters your bloodstream, that LPs binds with proteins, this lipopolysaccharide binding protein. And you travel around your body, your brain, and they end up somewhere, right?

Wherever they end up, they cause problems. Inflammation, right? Whether it's in your brain or your gut or your joints or your thyroid or whatever. So this is something called metabolic endotoxin and it's been associated with an increased risk for anxiety, depression, autoimmunity, metabolic disorders, cardiovascular disorders, even COVID 19.

Okay. So this is a really important phenomenon to understand when we're trying to heal shield gut issues and also heal brain issues. So metabolic endotoxin Mir has been found in children with pans of pandas, children, autism, children, ADHD, and children with a variety of mental disorders.

Okay, so whirlwind tour of why it's so important to understand the gut brain connection and what can go wrong for our children when they have any neuropsychiatric concern.

When your child presents with the psychiatric disorder, you got to look at the gut. Okay. Really, really put. We know that's a function of medicine, but now you know why it's especially important, even if your child doesn't have, quote, gut problems.

Right. Even if they don't have diarrhea, constipation, bloating, gas, whatever we typically think of as gut health problems. Right. We want to think of it as a microbiome problem.

Right. It's not microbiome problems, far reaching ripple effects for pretty much every organ system. Okay. So how do we restore that gut microbiome? That's dysregulated.

Now you're thinking, oh, my gosh, this is probably what's going on with my kid or this guy. What's going on with me right?

Gut dysbiosis, leaky gut, and endotoxin inflammation

And so what I talk about, so I have a book coming out next year and it's all about creating microbiome magic for children. Okay. And ideally, we would be creating microbiome magic every single day from the moment you're pregnant, from the moment they're born all the way through the rest of their life.

And we wouldn't ever need to heal a biotic, dysregulated gut microbiome. That's not reality. That's not the world we're living in. We can move towards that. And I know we can.

I know we can do this together, but we often need to reset the gut. Okay, so what is reset? Some of you guys have heard of the 5 hours of last year, but in my talk, I went in-depth into what the 5 hours are up to a week.

You get so much more beyond just healing the leak. So right. We really want to have microbiome transformation and so when we think about the reset first, the r e we have to return to the five things for microbiome magic.

And I'm going to go through all of that. How do we support a healthy gut microbiome to begin with? Because here's the thing. If you go through all the process of sealing and healing the leaky gut and getting rid of just biotic organisms, you're throwing maybe extracting msi2 oil and probiotics and glutamine and zinc, all the things that many amazing practitioners do.

I do too. But you are not restoring the foundations of a healthy gut microbiome. You're going to go right back. Right, right back. And I've seen this time and again.

It's I really we really I really start talking about how we need more foundations. Right. We can't just think think about

have people think about Jack's magic beans.

Right? Yeah. It's this is not like Jack's magic means you don't just throw some seeds on the ground, right? Like probiotics. And all of a sudden the next.

See this amazing tall line, right? The club to the heavens that gives you these golden goose x, right? You have to you have to really think about how you're nourishing everything underneath.

Okay. So we're going to go through each of the three set pieces. So five things you about magic. Then we're going to seal and heal the leaky gut, eliminate the despotic microorganisms, and transform the gut microbiome.

What does that mean? So we're trying to the five things, five elements, and these are five things when I talk to kids, five things you do every single day, right?

Already you're doing this. So now we just flip the switch in our brain and we do it in a way that nourishes our gut microbiome. We do it in a way that creates microbiome magic, and we do it in a way that allows your child and you to be gut heroes.

Right. Really important. So when we nurse, so we eat, breathe, move, drink at sleep every day. Right? Every day. So how do we do this in a gut here? Sort of a way.

So the first partners we can nurture our gut microbiome, and that's two phases, right? And you get to pick as a child or get, which is easier. Right. Is it easier to work on getting your microbiome champions in?

Right. We're going to talk about what those are. But yet, if your children are really, really, really picky right now, you're thinking, oh, my gosh, how am I going to get more vegetables into them? No.

Well, the part two of the service part to keep your microbiome mischief makers out. I apologize in a typo here. I get your microbiome mischief makers out.

Right. And we're going to see how to do that. Make easy swaps with what you're eating. Right. The second second of the five things is breathe. Right. And this is really getting back to the vagus nerve.

How do we optimize the gut brain connection? Then we need to move hydrated sleep in a way also that creates a microbiome magic. So when we're thinking about getting our microbiome champions and of course we're going to focus on organic, unprocessed or minimally processed, nutrient dense foods, some minimally processed means trying to not eat out of package as often as you can.

And when you eat out of package, choose packaged foods that you actually know what's in there. All right. So and then the main, the main area to focus on is getting in your whole gut.

Rainbow okay. So what is a whole gut? Rainbow has this three FS fiber and phytonutrients, which is not really an F, but it sounds like an afro. So give me a little leeway here.

So fiber, phytonutrients and fermented foods. Okay, so fiber y fiber, many of you guys know this, but are probiotics that are gut need something to feed on.

They need something to ferment. Right. That's fiber in our diet. Okay. You don't give your probiotics to food and these are not going to do any of the goodness that they're meant to do. Okay.

So we need fermentable fibers from our diet, fibers from our diet with a four mets before mentioned by provide to create what are called post biotics.

Okay. These are things like short chain fatty acids like Butyrate and the magic is usually in the post biotics, right, that have the post biotics. In fact, Butyrate are considered some of the master regulators of health.

Right. So we think, oh it's the probiotics might not be the probiotics, it might be the post biotics have the bigger benefit in optimizing our epigenetic resilience, supporting our large intestine, aligning reducing blood sugar reactivity.

Insulin resistance may even cross the blood brain barrier. It's a healthy brain. So there is a huge fiber gap in the United States and most of the modern world.

Most US kids do not get half the recommended daily fiber intake. In fact, only 5% of us meet our recommended intake and one in two kids don't eat any vegetables in a given day.

If three kids don't eat any fruit in any given day, right? So how many grams of fiber and this is a cancer investment. We should probably getting in about 25 grams of fiber at least.

Right, at least. And if you're email a little bit more of fiber in a day, what does that mean? In the case of one one medium, Apple has about maybe 3 to 4 grams of fiber right now.

Let's compare that to Tanzania's Hadza people who have widely been studied as they're really one of the few remaining hunter gatherer societies left in the world.

Right. And they have the richest gut microbial diversity of any population in the world. No processed foods, 100 to 150 grams of fiber a day, 100 to 150.

And all we're being asked to do to support our gut microbiome is 25 to 30. We can do it, guys. Right now, here's a thing. The lower the fiber and the higher the ultra processed foods in our diet, the lower the gut microbiome diversity.

So just focus on fiber and get in a rainbow fiber, right? Rainbow diversity matters. Diversity, variety, variety, variety. If you can. Right. The goal is at least 30 different plants per week.

Something you guys have heard this summer. Where the heck did that come from? Right. There's a thing called the American Gut Project. We looked at, I think it was 11,000 stool samples are still from over 11,000 American guts. Right.

And found that those who eat 30 different plants per week had a much richer gut microbiome diversity than those who ate fewer than ten plants per week.

Right. So variety matters and I highlight we often think about the vibrant colors, fruits and vegetables, but when it comes to fiber, we have to remember the tan brown colors.

They pack the most fiber punch per bite. Now, some of you are don't tolerate legumes right now, but legumes are really the biggest fiber fiber punch per provide.

Okay. But think of nuts and seeds and whole grains. If you're doing grains, think, think variety. And then we think of our phytonutrients as one of the two, three F's phytonutrients.

I mean, color each of the different colors, important parts, a different macronutrient benefits, a different epigenetic benefit. Our gut microbiome transforms these phytonutrients into benefits for us, and also it gives a different color, right?

So and we have just like we have a fiber gap, we have a phytonutrient gap. Eight in ten Americans has a phytonutrient gap in every single color of the rainbow.

Look at this. Right? Three quarters to 83%. Don't get enough of any of the colors in our diet. Okay. And we want to make sure again. Right. You know, when I think about variety, it does it like if your kids love broccoli and that's one of the few vegetables eat.

All right. Well, guess what? There is purple broccoli, right? There is green broccoli. If we love cauliflower, there's orange cauliflower, white cauliflower.

And there's Romanesque, which is like a greenish cauliflower, peppers, blue, orange, red, green, even that variety counts. Right. So it doesn't have to be different food necessarily.

Just get the same food in a different color. Okay. Fermented foods are probiotics with the punch. And remember, we often I mean, I learned fermented food just because there's probiotics in there.

Well, yes. And also, there's so many post biotics in there. Right. That the fermentation products, which probably are even more beneficial. Every culture has a traditional fermented food, virtually every culture.

So you have a lot of different options. Kombucha is one of the most beneficial and so you just get the know no alcohol or local kombucha for your children and that pickles.

A lot of people like pickles. You just have to make sure it's not pickles in vinegar only salt and water. You have to look because pickling is another process that our ancient cultures use to preserve foods just like fermentation.

So ancient process, right? But they're different. Pickling puts vinegar in to destroy any organism, even the good ones, right?

Microbiome reset: the five daily foundations

So even when you get pickles and you think of eating fermented foods, get real pickles with just salt and water and look at the label. You can see looking at the labels really important, there's a there's a Sonoma Brine or they have pickles right.

What's what's fascinating, though, because when I really look, Sonoma Winery has pickles that are fermented in water and salt brine. They also have pickles that have vinegar in them.

So you can't just say, all right, okay, so and fermented foods may win over fiber. This is a recent Stanford study that fermented foods may win over fiber in terms of improving microbiome diversity.

Okay. Don't get me wrong. I mean, fiber still or fiber start to benefit the function of your microbiome. So you do want both. Okay. But if you can get in a little bit of kraut sauerkraut juice or little forkful of have a little sip of kombucha, even better.

Okay. Thanks for saying that. Yeah. Yeah. So every every little bite counts goes. Okay, keeping the microbiome makers out is another part of nursing. Right? So what are the microbiome mischief makers?

We're going to focus your right on this ultra processed and American diet. Right. That creates microbiome havoc. Okay. So reducing the food additives, these these are FDA approved food additives, right?

The FDA allows these these additives to be in our food, reducing added sugars, artificial sweeteners, reducing glyphosate exposure, which is a herbicide.

Okay. And reducing or removing gluten and casein while you are sick. Right. While you're trying to heal is an important part of healing. The leaky gut, because they can trigger leaky gut by themselves.

They also can act as is opioid like peptides, proteins that can really drug your brain and your kids brain. Okay, so during the healing process, really important.

So eating real food, right? This one survey of almost 30,000 us kids found that almost 70% of their calories were coming from ultra processed foods. Ultra processed foods. What does that mean? Right.

Because we want to distinguish between ultra processed and minimally process. Right. I can buy a jar of Trader Joe's marinara sauce. It doesn't. That's really just like tomatoes, herbs and some.

Maybe some water, garlic that's minimally processed, like all whole food, real ingredients, right. Compared to ultra processed foods. It goes through many, many chemical processing iterations in a factory to make them saltier, sweeter, fattier, tastier, more addictive.

I mean, that's really the point, right? As to these ultra processed foods, it has so many colors, so many chemical iterations that they they're really not even necessarily recognizable as real foods, even though the packaging and labeling, they may fool you, try to fool you otherwise.

So ultra processed foods have been associated with ADHD, anxiety, depression, cognitive decline, mobs who ate a full of ultra processed foods or in pregnancy were found to have an increased risk of having it in their children.

It takes only two months, two months of eating a steady diet of ultra processed foods to lower the brain chemicals responsible for learning memory behaviors.

Okay. And four and a half old, a little further. Can you can you, like, show what that would look like in a family? So if somebody was eating the rainbow and then went through life stress as a family and then we actually went into an ultra package diet, that's what you're saying is enough to actually create a difference in the child's.

Yeah, 100%. Even in your brain, right? Even as an adult. Right. If you did this little experiment and for two months you ate mostly ultra processed foods take out from, you know, Taco Bell, McDonald's, wherever it is, right.

Takis, all the all the ultra processed foods. Right. And you're right, sometimes there's not really you know, life happens and we're just we go down a path where, okay, now the cooking in the eating has got out the door, right?

Life stressors occur. But in just two months, right. You may you if you really took a step back, look, you would notice in your family, probably not able to process information is more reactive emotionally.

You know not just maybe not getting along as well in the family and with your peers. So all of that can become such a steady decline that you don't necessarily associate with the diet.

Right, because it doesn't happen overnight. Right. But yet you want to look back and think, oh, what was that change? The biggest change was your diet.

Okay, then we can move. Move back. Okay, so same thing, right? Eating a steady diet of healthy, minimally processed foods also could shift your gut microbiome and you bring back right that's that's what we have to know.

And children who ate a junk food diet were much more likely to have behavioral problems by the time they turned seven. And we're an elementary school.

Okay. And these FDA approved food additives and colors, just some of them have been affected directly cause gut dysbiosis and leaky gut. Okay. Artificial food dyes.

If your child has behavioral or attention focused concerns or mood concerns, you have to get the artificial food dyes out. Okay. These are literally poison to your kids brains.

And in Europe, in fact, any food that has artificial dyes in it or preservatives must have a warning label that that food may cause hyperactivity and behavior problems in children.

We don't have those warnings in the United States. Right. So it's up to us as parents to be aware of that. Now, food additives, there's a special category of food additives called emulsifiers. Okay.

This is food that keeps your food together in the package without becoming a goopy gobbling mess. Right. Like

some ice can open and find this goop in there or a granola protein bar.

You want to make sure it sticks together, right to stick things together. Emulsifiers have been found to disrupt type gut type junctions. What does that mean?

Cause leaky gut also cause that inflammation. Right? In some countries there has been a association with the rise in emulsifier use in foods and the rise in autoimmunity.

Okay. What do you want to look for? Because it's not going to say on the package on the label emulsifier. It's going to say the FDA approves additives.

And there are I mean, there is I mean, reams and reams of pages, a website that has all of the food additives that the FDA approves of. I mean, it just blows your mind, you know, how many there are and what they're used for.

So but the thing to look for, mono and diglycerides so okay so that absolutely. And I've show my kids how to look at labels if they're wanting ice cream.

Okay, let's let's go through let's find an ice cream that doesn't have these. It just has milk, sugar and peppermint, whatever it is. So like minimal ingredients carrageenan pipes, 780 carboxyl methyl cellulose is also maybe what you find there.

Sucrose, fatty acid esters are muscle fibers. A shocking we are allowed an infant formula ready to feed liquid infant formulas that may have levels higher than what we know to be harmful.

So just being aware of added sugars, we know that there's way too many added sugars in our diet and I'm not saying have no added sugars. Okay. But when you use the 20 years ago, most people were eating maybe two, two teaspoons of added sugar a day.

And nowadays we're eating 17 to 34 teaspoons of added sugar in a day. Right. We have there's there's a disconnect there between how our how our palate and our brain has been trained.

And the high sugar, high fat Western diets directly can lead to gut dysbiosis and gut inflammation. Yeast love to feed on yeast. Yet yeast dysbiosis can underlie a lot of these these concerns.

Insulin, insulin resistance and blood sugar dysregulation really common in children are really common even for children who look fit and athletic and slim.

Not your picture of who would have blood sugar dysregulation. But when I have the opportunity to check a fasting blood sugar fasting insulin and I see that child with the fasting blood sugar of maybe 99 and a fasting insulin of 17, and that's considered normal.

And endocrinologists say, well, they don't have diabetes. Well, their head in their right. If you had nothing in your tummy right overnight and you're fasting, your insulin should be three, four, right.

I mean, there's nothing your insulin needs, right? So anyhow, we want to think about this. The other thing to remember in the back of your mind as a parent and as a child, yes, we love sugar.

We are taste buds. The first tasted on your toes, but there's no nutritional benefits to eating added sugar. Your kids do not need added sugar, right?

Sure, they might like it. Yes. Get it right. And I'm not going to say we don't have any added sugar, but know how much is too much and have where we want to limit it.

So children should have no more than 25 grams or about six teaspoons of added sugar in a day. Okay, now you can do a little detective work. I don't want you guys to be obsessive about this, but just know, right?

Like if your kids. My kids love boba cheese, right? Right. That's a thing, right? They go downtown, they get a boba so that I'll have them. They pick the flavor that they want.

And I'll say, why don't we look up? Look up for me? Like, what are the ingredients? Okay, because it's really point. I'm not saying no to the boba, but I want you to make the choice for the boba that doesn't have anything artificial in it.

And let's just look how much sugar is in. Well, guess what? One of the BO, which is a body wanted, had 34 grams of added sugar right in that drink. Think about how quickly you can down a sugary drink, right?

34 grams. That's about eight teaspoons. The lower rates. You can not spoon it eight teaspoons of sugar that quickly. Right. Liquid sugar goes down much more quickly.

So I told you, I said, look, I want you to enjoy your day with your friends, okay? You chose this, you know, this jasmine green tea, boba fine. Okay, have it.

But just know that's way more that than the added sugar that you should really have in a day to keep your body healthy and your brain healthy. Right. So let's think about how are we going to cushion that, right?

Have a safety net with healthy foods, vegetables, fiber and all the good things. Right. And then make choices so that if, you know, Wednesday afternoon is your boba tea day with your with your buddies.

Okay, Tuesday, Thursday, we're going to just prioritize eating really clean and healthy, right? So just, you know, just making those those choices in a smart way that doesn't deprive.

But let's has your kids thinking, how am I going to balance out all that balance? Okay. Sugar free isn't always better. These high intensity artificial sweeteners just as addictive as cocaine.

In fact, rats who were already addicted to cocaine chose saccharin over cocaine. Okay, that just say something. We know that some artificial sweeteners can disrupt the gut, microbiome and dysbiosis.

Okay, so don't go for the no sugar fake sugar drinks, okay? These are the fake sugars to avoid. And a lot of these sports drinks, there's been a explosion in sports hydration drinks, especially.

I mean, kids are all about the prime or the whatever. I'm like, oh, my gosh. Okay, so no sugar. Great. They have electrolytes if you're sweating and you want to perform well at sports, but they're full of sucralose, that is not the best option.

No, I choose coconut water any day. Okay. All right. Glyphosate is an herbicide that if you if you don't eat an organic diet, your friend unfortunate even with an organic diet, many of our foods have glyphosate.

Now, glyphosate was patented by Monsanto as an antibiotic. Okay, antimicrobial that kills a variety of bacteria and yeast.

Fiber, phytonutrients, and fermented foods

So just know when you're eating foods that are not organic, it can directly cause gut dysbiosis and it's been found to be beneficial to preferentially kill the beneficial lactobacillus bifidobacteria species in your gut while preserving, not touching the bad custody of salmonella species.

Okay. And glyphosate can also trigger inulin trigger leaky gut. And there's some evidence to that. Glyphosate may cause similar damage to the blood brain barrier.

Okay. So we want to be mindful of this and choose of the Environmental Working Group, you know, choose the Dirty Dozen list less. Prioritize those as organic.

Okay, let's prioritize the clean 15 or the ones. Okay. Maybe we have leeway to eat non-organic, right? And then most importantly with this, if your kids eat, you go if they go out with their friends and they get that rainbow unicorn frappuccino thing with a bag of artificial red dye takis know and you know the McDonald's burger.

Okay, like I might cringe a little bit, but if you envelop your child's gut with the phytonutrients of fiber fermented foods, if they're doing that and create that cushion, there's a safety net there.

So they're not going to unravel, fall apart. Right. I don't you we just need to build that resilience. That's why it's so important to always return to this.

The nourish the rainbow. Okay. Antibiotics, right? Just no antibiotics, as if you take them, are the single biggest disruptors to the gut microbiome. So and the gut disruption can be very long lasting.

So I always I teach my my patients and online on healthy gut topic is to know how to tell what antibiotics are really necessary and and supporting them with the gut reset know breathe vagus nerve remember the vagus nerve 80% of the communication goes from the vagus nerve to the brain.

The heart rate variability is a measure of vagus nerve function. Okay, but we're doing our breathwork. We're doing yoga. When we're watching nature, we it boosts it improve.

Lives are heart rate variability. Okay that is the goal with breathing in the right way with with engaging our vagus nerve every single day because our nerve is engaged, we enter that parasympathetic state where we can rest, digest and heal.

We spend our children included, and adults spend most of our days in our modern world in a sympathetic fight or flight kind of upregulated state. The parasympathetic comes in, balances it out.

Now, if the sympathetic is up here and the parasympathetic is down here and doesn't get any practice exercise, it's not going to have the chance to come up and say, Hey, sympathetic, take a break.

I can take over, right? So we need to give our parasympathetic nervous system muscles. We have to workout every day, just like we want to exercise day.

And when we improve our heart rate variability, okay, that has been found to be associated with higher gut microbiome diversity in children. Okay. Higher stress and lower variability is associated with lower microbiome diversity in children.

So prove vagus nerve function, improve variability, improve gut microbiome diversity. And this was independent of diet. Okay, so if your kids are not eating the healthiest, most varied, hold that rainbow diet just yet. It's okay.

Work on the vagus nerve, right? It's still going to help. There are different ways to optimize your vagus nerve and there's this could be like a whole other lecture in itself, but just know they're cognitive behavioral tools.

There's a whole series of books by my favorite child psychologist Don Huebner. H u e b e r is a whole series of books for kids to teach them cognitive behavioral tools, like in her book What to Do When You Worry Too Much or many books about Mighty Fears, they're amazing.

But you can practice mindfulness or different apps that have mindfulness, meditation, breathing exercises. It's heart math, which is a biofeedback app, practicing gratitude and loving kindness as a way to engage your vagus nerve, laughing, you know, laughter, yoga.

And if t tapping emotional freedom, taking tapping if you guys are familiar with, that's a great way to optimize heart rate variability. A moving exercise exercise is also a that's a beneficial effect on the gut microbiome, on diversity and function.

And just like with vagus, there were these benefits were fed independent of diet. Okay. But the thing is, the positive effects will be reversed if you return to the sedentary lifestyle.

So you have to keep moving it early left exercise. Get your kid moving right early life exercise had even better benefits to long term microbiome composition and lean body mass later in life.

Just a little note. So like the high intensity, if you're a triathlon trainer, the intense exercise can actually cause temporary, leaky gut. Okay. So just be aware of that.

We just said in moderation for our children, hydration really important is the Bristol stool chart, right? Ideally, we want this type three or type four, a happy, soft, you know, kind of a long, smooth banana.

Okay, maybe Some corn on the cob, but also stuck to it, held together. So hydrate, hydrate, hydrate. Okay. More than 50% of kids don't drink enough water.

Adults are actually worse and low water drinkers. And studies have been found to actually typically also be low fruit and vegetable eaters. Okay. Higher water drinkers have different gut microbiome, low water drinkers with with lower levels of harmful bacteria.

So drink, drink. What's a good rule of thumb? So in terms of water, right. So I have this is a 24 ounce mason jar. So you take for a child, you can take half their weight in pounds divided into how many ounces of water in a day they need to they should drink.

Right? So let's say you have £100, you know, middle schooler, right? And then you ask me, okay, so maybe they should have a 50, 50 ounces of fluid in a day minimum if it's a hot day, if it's an exercise that they need even more.

So that's about 50 ounces, right? So then I'll say fill up your water bottle. If you have a 20 ounce water bottle, that means you need to drink about two and a half of those.

Okay. To have that visual of if they're drinking out of this at home over the summer, but two of the more than two of these, so that's 48 ounces. You want to have that visual for them so that they know this is about how much I should drink.

You have that goal really important for adults to. I'm so happy about this. I really want to normalize parents talking about poop with their kids usually and making sure they poop every day because so many people come to us and they've been sick for years and really they had serious constipation and weird digestive issues when they were kids, but it wasn't normalized talking about it in their households.

Yeah. Yeah. So when I actually had one kid with with teens, what we had to digest just that what he was presenting with this a new or really debilitating anxiety.

And so I wanted to do a comprehensive test. Right. And he was maybe about eight years old at the time. And by then, you know, as a mom, be doing well, happy to be there.

But anymore. Right. But then we often that don't discuss okay, are your bowels healthy? Right. And so when I did the stool analysis and the mom was helping him with poop collection, it was only then that she realized, oh my God, he poops like once or twice a week, right?

I mean, that was that was no. The only time that. Right. Because you ask kids, how are you pooping? I don't know what your poops look like. I don't know. Right.

So you want to help them understand?

Avoiding microbiome mischief makers

It's good to look at your poop. Look, you know what it looks like. Identify how it looks and how it changes depending what you eat, what your mood is, and all of that, whether you're moving right.

And then one of the things, too, that's really important to talk about is sleep, children and adults. The vast majority of us are sleep deprived if we are not getting enough sleep and sleep deprivation, it can change that gut, microbiome and gut function within just 48 short hours in two days of not sleeping well.

Okay, so think about final time. We finalize with your with your high schoolers. Think about jet lag, all of that. Right? So it's not to say don't do finals and don't travel ever.

It's just to say, you know, what is during these times, my gut needs a little extra TLC, right? So sleep deprivation and we've shown lower levels of post biotics after sleep deprivation remember that helps lipopolysaccharide endotoxin the increases after sleep deprivation so we all know right received your pipe what happens the next day?

You're mostly more reactive. You're sleepy. Your brain, your brain fog. You can't remember, right? You're irritable, right? Well, yeah. Where that semi from?

Could it be because we have it up here because we actually have LPs circulating causing inflammation in our body, in our brain. Right. Sleep deprivation also can directly result in mitochondrial dysfunction, which is so important.

That's another topic. Right. But mitochondrial function. So if you have chronic health concerns, sleep deprivation reduces serotonin levels and can cause neurotransmitter brain dysfunction and create systemic inflammation.

Now, changes are reversible now after one week of sleep recovery. But look, two days to have a disrupted gut microbiome, seven days to recover it. Right.

So we always want to really focus on keeping sleep as healthy and optimal as possible. Okay. And then we have the five things. Remember, these are essential if you are not eating in the right way, sleeping in the right way, moving your body, hydrating right in the right way, breathing vagus nerve optimization in the right way.

What do I mean by the right way in a gut hero way that supports a healthy gut microbiome? None of the rest of this stuff is going to make much of a difference, right?

Like I said, yes, you can feel better. Yesterday gives me a better great. I've had kids for rheumatoid adjuvant, juvenile rheumatoid arthritis go into remission, but we didn't have the foundation set.

So then remission. But six months later, joint pains right back. Right. Not a remission anymore. So we want to make sure we have stations, but we also need to then seal and heal.

We got if it's leaky, the right probiotics, the right butyrate, the right foods will actually heal the leaky gut, too. Okay. That's why it's so poor. Because then your job as a practitioner, as a parent, as a child, it's less difficult to write fewer supplements, less time to heal the leaky gut if you have the right foundations.

So you should give your gut a break. And this is going to be we're hopefully working with a functional medicine practitioner. You can identify what foods your child may be sensitive to and having that variety and rotate them and adding gut repair nutrients like glutamine, zinc, fish, oil and quercetin.

These can heal that leaky gut lining. The the e and reset is eliminated despite organisms this is we're doing a functional stool analysis is really helpful because I can tell just by looking at you or your child what dysplastic organisms are in there.

I just move away. Only a still analysis can do that. That being said, sometimes if you don't have a function as a practitioner to guide you doingsomething like MCT Oil or biocidin you can be relatively safe and mostly effective way unless you have some, you know, some resistant organisms to get started.

A serum derived bovine immunoglobulin or SBI mop up if they kind of bind to these LPA. So Lipopolysaccharide in your gut released from those gram negative bacteria before they can enter your bloodstream.

So if you have any and no toxic side, then this serum derived bovine immunoglobulin or SBI is really helpful. And then you might do things like charcoal or other binders to mop up some of the die off products.

And these gut microbes. Okay. So all of this is a little bit advanced, but you probably know many of you guys are familiar with this, but I sort of put this out there.

So, you know, something you can discuss with your practitioner. Okay. And the transformation piece of this is lifelong. It's the same thing with, you know, getting back to the rainbow or the whole the rainbow, but transforming the gut microbiome.

This is where, yes, you may need a prebiotic and a probiotic and a post biotic supplements. Okay. You may need to take extra probiotics in the form of maybe inulin or maybe one of my favorites is now a human milk oligosaccharides called 2FL probiotics.

Remember strain specific that can restore the gut microbiome achieving the goals that you want and post biotics. There are some post biotics now that can be used as supplement form.

The probiotics will get fermented by the probiotics to make the post biotics, but you can also take a butyrate supplements. And then this is where we double down on our brief part.

We double down on our vagus nerve work. We really get to work on improving heart rate variability for sustained healing and then might be doing acupuncture.

That might mean really that investing in a heart medicine or feedback device and doing heart math every day with your child, it might mean getting a vagus nerve stimulator.

And I use one called the Apollo neuro because for children it's the only one that's really recommended for children. There are other devices that look really promising, but when I spoke with the manufacturers, they say, oh, we can't recommend the children.

I mean, they're covering themselves. I totally get it. But we need more support for our children. But as an adult, you can look into other vagus nerve stimulation devices, which can be very helpful.

In fact, there's one device that was authorized by the Canadian Health Ministry for for treatment of Long-Covid, right? So support to use the work on the vagus nerve because that will transform your gut microbiome for life.

All right. So just in a recap, the gut reset, we have to return to the five things for microbiome magic. We are really in a gut zero way, learning how to nourish, breathe, move, hydrate and sleep.

Five things we do every day. But just do it in that hero way with the seal and heal the leaky gut. Eliminate or despite it gut microbes, microorganisms and transform the gut microbiome.

All right, let's let's here for the gut break connection for the win for your children with any mental health concerns for you, too. If this is something that is affecting you.

Vagus nerve, hydration, sleep, and long-term healing

Oh, Elisa, I'm just so thrilled that you're here to share your brilliance, because I think this is just like a perfect overview of some of the big issues facing parents, children today that may or may or may not be understood by your pediatrician right now.

And the data is all there is. Just taking a while to, you know, emerge and to reach our larger population. So I really

want to recap. I know we're out of time, but I really want to take one quick man.

Up for sure. And just underscore some of the most important points that I heard you make today. And I really want parents to look at if you're if you're seeing neurodivergent behavior in your child to become a detective.

And what is that gut brain connection? Because you could be looking at a broad range of issues, whether it's pans pandas like Dr. Elisa talked about today, autism.

She referenced, you know, the the you know, quickly getting established link between glyphosate and other environmental triggers for autism and NEURODIVERGENT issues and ADHD.

We have so many weird stuff going into our foods. We have got to be literate today. What happening to our kids? And I just love your your deep exploration, not just of the data and the problems themselves, but also what do parents have control over today?

Yeah, yeah, yeah. So is there anything that you want to leave us with? We have newbie parents in the audience, of course, and then we have, you know, are advanced parents today who are like, yes, double down on this, Dr.

Elisa. Let me let me know what what are the few gems that I missed? Because they they've heard about leaky gut and they've been trying to eat the organic foods.

They're looking out for the food dyes and things. So anything you think that often gets overlooked by those advanced parents that are deeply committed to their kids health, they're just worried.

What are they missing? Yeah, I think for the so the first thing I just want to all parents listening is no matter where you're starting from, your child is starting from there's we can always move forward.

Right. And it's just really just taking it one step at a time because all of these can sound really overwhelming to do all at once. You don't have to do it all at once.

Some of you are going to be ready to dove in and do everything. It was another. Others of You just need a little more time and that's okay, right? This really is a lifelong journey because the the steps that you implement and your child implements in their lives, these are steps that they will take with them for the rest of their lives so that they can be healthier college students and healthier young adults and healthier parents.

So it all sets that stage. So I would say one of the things that gets overlooked in is why put the debris, the vagus nerve work as their all important, all those type things.

Right. So if you want to if you worked off sleep first, that's fine. Right. But really prioritizing, we tend to I mean, in functional medicine. Yes, there is now the fifth are is the restoring that the gut brain the mind body connection.

That fifth hour when I was training function medicine was not there. It was a 4 hours right. With this finally recognition came but what we really need to do this mind body work but still it's often put to us when I get to it first let me work on the gut and then I'll get to that.

Okay. I really want parents and children to understand when you want to work on the gut, you do that. You work on the vagus nerve because that will make the rest of your job so much easier.

Okay. And it really has to be. And as practitioners, too, as practitioners listening, it's really important. I mean, you know, we spent so much of our time and I'm going to give this to you when I was first, right?

So much of our time in the office going the supplement protocol and the dietary changes and the rotation and the elimination diet and and and here's here's a bag of supplements.

Right. And I see you in two or three months as repeat some of the test. Right. And oh, by the way, yet you get into

meditation and walk in nature. Well, if we started the other way, if we really started with, you know what, start with this, right?

Start with maybe 5 minutes of, you know, loving kindness, gratitude, meditation at dinner, at the start with this breathing app, meditation that you do together at nighttime.

Okay. And then work on just removing the ultra processed foods. Why don't we start there, right, and then see what supplements we need, see how we might change the diet, but we've got what happens too much and functional medicine as practitioners and as as patients.

Right. We get still stuck in the same conventional paradigm of looking at the labs and here's a supplement to fix that. Here's a thing to fix that. And we're not looking at the patient in front of us.

We're not looking at who we are and what, you know, what's going on at a more global level, a more holistic level. So we have to really move beyond that conventional paradigm because, you know, it's still the same that. Right.

We're just switching, you know, natural natural drugs in place of pharmaceutical drugs is still the same. So, you know, shifting that I think will make the biggest shifts in our health.

Absolutely. And that's two beautiful notes. And Don, thank you so much. As somebody who went through pediatrics stuff that did not get diagnosed, I just I hear so much of my own journey adding up and in every slide that you have.

And I just hope that folks are really who are recognizing themselves and their families in here are really hearing, above all your message of hope. So, yes, there's always hope.

I can't wait to read your book and share it with everybody who will listen. And so I'm sending you all the good the good vibes for finishing up your manuscript, and I'm seeing you great.

Thank you so much, Elisa.