## Introduction to Pediatric Mental Health

Welcome back to the conversation I have today. Dr. Elisa Song, thank you for being here. Oh, thanks, Laura. It's my always my honor. I know we're going to talk about pediatrics today and specifically pediatrics and a lot of mental wellness and mental health we're going to cover today.

And it really is important to the inflammation talks that we're having and the root causes of what's happening with our kids and why we're seeing this rise of anxiety in our children and and depression and suicide attempts and all these things.

So this is really important that we're covering this. You are America's pediatrician. You're an integrated pediatrician, pediatric functional medicine expert.

So you integrate both Western and functional medicine and you have an integrated pediatric practice called Whole Family Wellness. And you've helped thousands of kids.

And I would say your reach is so far because those are just the kids that are hurt that you've seen. But the multi thousands that whose families you know, tune in to learn from you and listen to you and you really help families get to the root cause of their health concerns.

And you empower parents. And that's a big one. You empower parents to help their children thrive on all levels. It's not just about solving an inflammatory problem in the body, but this is about helping them with their mind, their spirit.

It's a holistic approach. So I love this. I wish I would have known you when my one my my big one was a little one, which is she actually graduated from pediatrics.

She's 18. My gosh. Why? So let's start off and just talking about the mental health state of emergency that we're in right now in the United States and around the world.

But specifically, we can speak about the United States because that's where we're at. And this specifically is especially a problem in regard to what just sticks right now.

So we know that one in three teenage girls has an anxiety disorder, but it's not just girls. By the time kids are 18 one and two are teenagers is actually going to be diagnosed with any mental health disorder.

And during the pandemic, childhood mental health was considered, was called into a state of emergency. But we've really been in an emergency for a very, very long time.

And I'm just hoping that this is really the light that needs to be shined to really make it a public health priority. So the suicide attempts are really and the suicide completions are what are so devastating.

So one in five teenagers when surveyed has seriously considered suicide and one in ten have actually tried. And when we look at ER. visits to for suicide ideation, write suicide attempts during the pandemic, those numbers went up significantly.

Now, when we look at the leading causes of death, which is such a morbid thing to do, but we have to kind of put this into perspective. So among our youth are young adults, 15 to 24 years of age.

I mean, they're just barely young adults, right? Teenager to young adult suicide is the third leading cause of death. But guess what? Number one and two are number one is unintentional injury, which often goes along with the risk

taking behaviors that that go along with mental health concerns.

Number two is homicide. Number three is suicide. Right. You know, when we look at the statistics from this is from last year or actually this is from 2020, so around 6000 15 to 24 year olds died by suicide.

When we look at COVID 19, which I'm not making light of COVID 19, but 501 youth died from COVID 19. 60,000 died by suicide. Right. So where are we prioritizing our public health dollars?

And the kids who died of COVID had probably preexisting health conditions for the most part. Many did. Many did. These were not perfectly healthy children.

They had similar health problems. And this is you know, I'm so glad that you're shedding light on this and speaking about it so matter of factly and candidly, these are things we cannot ignore.

And, you know, the conventional treatment of anxiety and depression, is it working for our kids or for adults, for that matter? So if you're if you're an adult listening to this without kids or your kids are grown up listening because this is probably pertinent to you as well, I mean, pediatrics, they're just little adults, right? Yeah.

So a lot of what affects them affects us as well. But but can you talk about what's happening here? Why are treatments not working. Well, I mean, as any of the listeners know, conventional medicine, there is a time and a place for conventional medicine.

So I'm not saying that there's never a time for that.

## Why Conventional Treatments Fall Short

However, that conventional treatment doesn't look at really why and how kids, teenagers, adults got to this place in mental health crisis to begin with.

And many times when we look at it goes way back. And when we look at the main medicine used for treatment for depression and anxiety, those are SSRI selective serotonin reuptake inhibitors.

And for our youth, they have a black box warning that they can actually increase the risk of suicidality. When you start with kids and teens, that's exactly what we want to prevent in the first place.

And for many kids and many adults who have been on SSRI as they have this experience, it helps at first, it helps lift some of that depression and some of that anxiety.

But after a while, it stops working. Well, guess what? SSRI, which are meant to trick the brain into thinking that there's more serotonin around than there is actually over time can deplete your serotonin levels.

And if we're not re pleading, replenishing, building up serotonin levels, there's not anything for that SSRI to even work on. So it makes sense that there's not really a long term fix with most of our psychiatric medicines.

And then when I think of children, so most kids with one psychiatric disorder, they don't just have one. They may have anxiety and ADD. and then maybe they have OCD or even ODD.

I mean, all of these acronyms pile up. So then they're on, you know, Prozac for their anxiety and then they're on Ritalin for their depression and then they're on, you know, maybe risperidone for their OCD.

And the list goes on and on. So they're on this polypharmacy of psychiatric medicines that then may have interactions. So we don't know what the side effects are, what the kids behaviors are.

And so we can see it becomes this around and around vicious cycle. So like I said, sometimes there are cases where medications really do help and are needed, but the vast majority of the times they're just kind of slapping a

Band-Aid on what's going on.

And they're not a long term fix. And this is this is rampant in so many areas of trying to treat the human body. I mean, in this specific talk, we're talking about teens and kids with anxiety and depression and, you know, moods that aren't stable.

But if you think about the way Western medicine approaches a lot of these things, it's Band-Aids without solutions. So I'd love to actually unpack what's really going on here.

So this is what what's the beauty of your practice is that you are in integrative. So you, you have all the training and the learnings of a Western medicine pediatrician, but you also bring this functional aspect and this part of you that is, you know, curious and inquisitive about what is the root cause.

And that's what this summit is all about, is root cause. And, you know, anxiety and depression. This is an inflammatory process in the body. So what is the root cause from a functional medicine approach to child and teen anxiety?

So when we look at the root cause, I will say just as a caveat, there typically is never just one root cause. All right. There are typically many underlying factors.

And there might be one thing that stands out in that parent's mind or stands out in that child's mind as, oh, that was when this happened. And that is basically the straw that broke the camel's back.

I mean, when we think about pans or pandas where a strap infection may trigger the sudden onset of OCD, anxiety tantrums, you know, cognitive regressions, well, yes, it was an infection that triggered it.

But there was a whole background likely of immune dysfunction that was simmering underneath that inflammatory response that you can't see, because I can't look at you and see, oh, how much inflammation is inside there.

I might conjecture. Right. But but we really have to take a look and see where how far back can we go to discover some of these root causes and kind of peel back the onion and say, what can we where can we intervene?

And the first and most important root cause to understand for childhood teen anxiety, mental health concerns is really the gut brain connection. We need to figure out what is disrupting that connection, what are the nutrient deficiencies, what are the toxins that kids are being exposed to?

What are all the sources that are causing a dysregulated gut brain connection? And that's where we can do some digging. From a functional Medicine standpoint.

I would love to do that today. Can we dig? So we can dig. All right. So we've got this gut brain connection that's so important. And I know you've spent a considerable amount of time researching this and even developing strategies to support children and gut health.

I mean, you're really a leader in this area, so we're really thrilled that you can be here talking about this, too. So in terms of nutrient deficiencies, is it different than kids and adults mental health?

Is there something specific that you're looking for in kids nutrient deficiencies? So what is that and is there something unique about kids that sets them up for this? Hmm.

So you know what's interesting? I would guess that the same nutrient deficiencies that are really common in children are likely also common in adulthood.

But for kids, it's you know, we have to think about children and teenagers.

## Root Causes: Gut-Brain Connection and Inflammation

They need nutrients to grow and repair. As adults, we've mostly stopped growing. I mean, yes, our brain is plastic and hopefully, you know, we're growing in all the right ways.

But but we've kind of we stopped growing in terms of our, you know, neurodevelopment, our immune system development or our our gut development. And so now it's all about repairing that dysregulation, that can occur from living in our modern world for children.

They need to grow and thrive and also repair all of the toxic assaults that are facing us in our ultra modern, ultra processed world. So in a sense, they need even more.

I mean, when you think about kids and what they take in, you know, pound for pounds compared to adults, kids eat more food, drink more water, breathe in more oxygen.

I would say they probably think more thoughts and I think that's probably true. All right. But all of these inputs, I mean, kids just need a lot more of so you can see why it would be much easier for kids to become deficient in certain nutrients and, you know, across the board, but especially for kids mental health and teenage mental health, there are certain nutrients that we really want to focus on.

And these are the top nutrient deficiencies in children. So vitamin D, I mean, that's a common nutrient deficiency even in adults. But we know how important vitamin D, which is actually a hormone, is for brain development and mood and cognition.

Same thing with Omega threes are essential. Fatty acids are EPA and DHA, which you really have to get from fatty fish. But most kids, many, many kids don't eat a single serving of fish or seafood in in a week.

Right. I didn't eat like any in my lifetime. We didn't get food in my house growing up. It's so interesting. I mean, sometimes we have COD, maybe. Yeah, you know, that was a relatively cost effective way to feed a big family.

But we weren't eating salmon every night. And when it finally was introduced to me in my teens, I hated it. And so my mom would make it for my dad and her.

And she's like, you've been have a hamburger. And if you don't like the salmon, it's like filet mignon price, right? I was like, Give me the hamburger.

Because I didn't like it. Yeah. Yeah. And that's where we really have to introduce these flavors, right? I mean, my daughter loves Salmon Roe extra, but that's like I mean, she liked it long before I did because I didn't grow up eating it.

Right. So we just introduced her early. Another big one is iron. So it's really fascinating is even for teenage girls who are not outright anemic, their hemoglobin looks fine, but their ferritin are low or on the very low end of normal just by bringing their ferritin up to maybe 40, 50 or above, significantly reduced anxiety and depression and improved mood and cognition.

So iron is really, really important. And then we have magnesium and zinc are essential minerals that are really necessary for brain and mood and calming and neurotransmitter production and zinc in particular.

You know, a lot of kids with mental health concerns, they also sensory issues. You know, the tags bother them, the sounds bother mom chewing bothers them.

I mean, everything's just too much for them. And so zinc is really important for any sensory issues that often go hand in hand. You know, for instance, with kids with ADHD or kids with autism and zinc especially is important for teenage boys because you need zinc for testosterone and appropriate puberty.

So all of these nutrients, when we think about it in terms of kids mental health, we need to make sure kids are either getting them a supplements and measuring their levels or trying to find foods to fill that need.

I think that people listening right now are just as surprised as me. Do you mean my kid who can't handle tags and seems and the sock has to be on just right that that could actually be distinctive.

Oh, my gosh, Laura. 1,000%. I know when my son needs more zinc, when he starts complaining that his shoes aren't tight enough and he takes like 15, 20, 30 minutes to tie shoes on right.

Even, you know, sounds the kids who cover their ears because the blender, the vacuum cleaner, public toilets, kids who are picky eaters because they only like certain textures.

I mean, I'm not going to say 100% is going to, you know, fix everything for your child. But if you make sure that their zinc levels are appropriate, so many of those sensory issues melt away.

I'm just saying, I know adults like that. Oh, yeah. I'm sure they need zinc to. Just get grouchy. They just it just becomes like they're who they are right now.

No, not like the be quiet people like me. How is I mean, I can tell I need more zinc when the very same. I have a sweater that I wear when it gets chilly in the office.

When that tag starts to bother me, I'm like, Oh, okay, I need zinc because it only bothers me sometimes. Or when like my husband chewing and smacking his lips, it drives me crazy.

I'm like, All right, I need more zinc. I happen to know that I tend to run low on zinc because, you know, I run functional medicine tests on myself and I know that I'm chronically always low in zinc.

And then I ran my DNA and found out I've got these like zinc metabolism pathways that don't work. And I know like I am one of those people that gets super irritable about sounds, textures, noise is and I always just thought, oh, it's because I'm analytical and intense, right?

No, it's probably it's the zinc. We get off this, I'm going to go take some zinc. I have lots of things. Zinc is you have to take it with food. When I take zinc on an empty stomach, it makes me sick.

And I think it's true. And that could be if you ever give your kid zinc on an empty stomach, they'll never want to take it again because they'll feel like they want to throw up, right? Yeah.

So take it with food. Take it away from your iron because zinc and iron will compete, you know, for absorption. And, you know, a trick that a mom taught me.

I mean, I was watching this kid, her zinc levels when I measured they went up so incredibly well after a few months and all mom and reading no supplements because they made her tummy feel too upset she ground pumpkin seeds into fine powder and put them into everything meatballs, soups, salads, oatmeal, I mean, whatever it is.

And her zinc levels went up. Wow. So, you know, you can eat it. You can do it with food. It is possible. Okay, this is great. Now I want to shift into any more nutrients before I shift into toxins here.

## Key Nutrient Deficiencies in Kids

Those are the main ones. Yeah. Okay. So in the last 5 minutes that we have and I know I'm like putting a time if you can do this in 5 minutes, but we can keep talking.

But in this first part of our talk here in 5 minutes, if you can dig into the chronic toxins are the main scuse me the toxins that cause chronic inflammation and disrupt our kids gut microbiomes.

Because really, if it's if the brain function is so influenced by the gut, we really need to think about what's affecting that. And I think kids have some unique exposures over adults, too.

Yeah, absolutely. So there are I categorize the toxins, the three main categories. Okay. So the first is the food we're eating. I mean, the food we're eating in packages for the most part, it's poisoning us is poisoning our brains.

And we can dove into that these ultra processed foods, especially those with too much added sugar, those artificial colors are poison to kids brains. Your kids have any attention? Behavioral concerns.

Just take out the artificial colors and I guarantee you will see a lift in what's going on for them. Emulsifiers, the mono and Douglas rides carrageenan those things that keep our food together and prevent it from being in a goopy mess.

And by the way, are allowed an infant ready to feed liquid formulas. They are known to directly trigger zonealarm release cause leaky gut and gut microbiome disruption.

Can you give some examples of kid foods that have that? Because I'm thinking of adult foods like, for example, coffee creamers like nut coffee creamer, oat coffee creamer that's like full of these.

Like, it's just garbage. What about kid food? Where would we find that? Like, pudding or something? Ice cream. Ice cream? My kids wanted ice cream the other day.

And I said, sure. I said, You guys go there 12 or 14. You guys go to the freezer aisle and pick me out. Pick out an ice cream that you guys decide on the flavor.

And you know that I will be happy buying, right? And so they came back like, mom, look, this one had Bono and Diglycerides and you look, this are not the carrageenan.

I mean, you can see I've been talking with them for a while. Right. But they chose the ice cream. They chose it was organic. I think it was Strauss's vanilla ice cream.

It had sugar cream. Vanilla. That's it. Right. But there are many, many ice creams that have the mono diglycerides and the carrageenan to keep it together.

So that's one some of the protein bars that kids think are so healthy or yummy and eat them just look. They may have emulsifiers in them. What else? I mean.

Yes, puddings, but but even some of the solid foods. So you just have to look at the labels. I mean, it's astonishing how many foods have. And, you know, the FDA allows a particular emulsifier in infant formula at levels that are well above what are known to be dangerous.

I mean, it's just, you know, the regulation of our infant food, because really when we think about the gut brain connection and the future metabolic health, brain health of our of our teenagers and young adults and adults, it starts in childhood.

And so we need to be really aware of what's going on there. For teenagers and older kids, medications are probably the most acute microbiome disruptor and disruptive to the gut brain connection, especially antibiotics.

Antibiotics are I mean, they immediately they'll kill all the good stuff right along with the bad stuff. And so if you're not replenishing and restoring your gut microbiome, there's one say this showed that just one round of antibiotics could increase as acid infants could increase the risk of that child developing a mental health disorder when they're older kids or teenagers by up to 50%.

Well, yeah, 50%. And the more rounds of antibiotics, the higher the risk. And the risk was highest if that first antibiotic was given under six months of age because of the profound effects that the gut microbiome has on our babies developing brains and the downstream synapses and everything else that's going to, you know, lay the foundations for the future.

But it's not just antibiotics. So step back and think about your teenage girls. Right? Maybe they're on a little doxy cycle for their acne, right. Microbiome disruptor.

Maybe they're on birth control pills. Right. For their skin and also maybe for birth control or they're PMS. That's another microbiome disruptor. Maybe they're on an SSRI because they're anxious and depressed like all of their friends are.

So that's another microbiome disruptor. And then if they're on steroids or ibuprofen or reflux meds, those all disrupt the microbiome. Now, I will say so these are more acute.

We can see them. We we can know, all right. That your kids are on them. Let's do something to help restore their gut microbiome. But one of the hidden, most common, you know, inflammatory sources for kids and teenagers and for adults is chronic stress.

Psychological stress, right. Chronic psychological stress is what I would call the the biggest, most important chronic microbiome disruptor. And toxin. And toxin.

Yeah. We need to treat psychological stress as much as a toxin, as any environmental toxin, as much as glyphosate, mold, heavy metals, infections. And in fact, some studies show the psychology of stress triggers a higher inflammatory response than physiologic toxins.

And what's fascinating is that psychological stress can trigger Zaniolo Lin release, can cause leaky gut within a matter of hours and can directly cause gut dysbiosis.

And if leaky gut is happening, then leaky brain is happening. One thing that breaks down the gut barrier breaks down the brain barrier. That's right. We have Donlin in our brain, in our gut, in our kidneys.

I mean, so many organ systems. So guess what else, like you said, is being broken down? Everything. So let's give some, you know, I want to wrap up here on this, but I want before we let our audience go to the second half of our talk here, what are some of the psychological stressors?

And in particular, what was so big about COVID and the pandemic that really unveiled what you said has already been there. We've already been in a crisis.

But this really unveiled there was a lot of psychological stress there. Yeah, well, you know, some kids sailed through the pandemic. You know, the kids with social anxieties.

Maybe maybe that was actually better for them. But for most kids, especially for our youth and our teenagers, social connection is so important. And Zoom remote connection, it's not the same.

And so so many kids and teenagers, it's it's fascinating how many of my kids and how many other pediatricians are telling me so many of their their pediatric patients developed OCD during the pandemic.

Just being stuck in your own head, in your own world, you know, just really, really triggered all sorts of mental health concerns and that lack of connection.

I have kids who had to be sent to residential treatment because they just could not manage the psychological stress of not being in the world, with their community, with their people, with their friends.

And that's a top that off. So what did they turn to? Right. So they're texting and chatting with friends, but then social media, right. And we know that for the most part, when you go off of social media, you feel worse about yourself than when you got on.

Right. And so, you know that and the pressure there. And then for the so for boys who is mostly gaming so they would communicate on discord and game together for girls it is mostly, you know, Instagram and texting.

Right. So great ways to stay connected. Yes. However, what it does to the brain chemistry and how it changes the synapses and your dopamine centers, we need to think long term.

Okay. Now we're out of the pandemic.

## Toxins, Medications, and Chronic Stress

We need to reel back in that screen time that took a pass during the pandemic because it's not helping your kids brains at all, you know, for for development into the future.

I mean, boys brains develop at least into their late twenties. Right. And we know that the same explosion of those synapses, those brain connections that occur in infants in the first few years of life, when you turn around, you can see your baby's wheels turning and they learn a new skill.

All of a sudden, that same explosion is happening during our pre-teen teenage years. But you don't get to keep all of those synapses right. They explode.

And think about a rosebush just going crazy, right? You have to prune it, right? If you're a gardener, you know, you have to prune and just trim and, you know, just really, you know, get rid of some of those buds so that the ones that remain are filled, you know, with all the nutrients and thrive and really grow the most beautiful flowers.

However, we need to make sure that all of those synapses are laid down in the appropriate way. So think about, you know, as your kids grow, whether they're toddlers or whether they're teenagers, what connections do you want to foster and grow because they're not going to get to keep all of them. So hopefully, hopefully they grow the right ones and they keep the right ones.

Oh, my gosh. This is so I have so many comments and questions, but I need to end this right here for now. So, Dr. Lisa Song, thank you so much for joining us today for this talk on pediatrics, mental health, inflammation, gut health, all of it to our audience.

I hope you found our conversation insightful and helpful. If you're a summit purchaser, stay right here, because we're about to dove deep and deeper into this discussion with Dr.

Song. And I'd like to shift the conversation to talking about the vagus nerve. And I want to talk about tools for improving vagus nerve function in children and wherever else that we can go during the time that we have together.

And so if you're if you're not a summit purchaser, click on the button on this page to get access to a continuation of this conversation and many others, and get the tools you need to reclaim your health.

If you're watching this continuation of my Talk with Dr. Lisa Song, thank you for being a valuable member of our community. We're going to dove right back in. Dr.

Song Real quick, before we shift into Vagus Nerve, I just wanted to point something out about, you know, there's we could probably talk about the psychological distress of the pandemic for an entire hour.

But the other thing, there's that social isolation piece. But the other thing that I'm assuming had a huge impact on our kids was watching the adults be in complete fear.

There was a fear that gripped the world, not just our country and our community, but everyone was afraid of dying or their loved ones dying. And our children watch what we how we respond and when we're responding, not knowing what to do, stressed out, short tempered, disagreeing with family members each other within our household about how we should handle this.

You know, yelling at the TV or having that on. And and I mean, families were divided over this. I'm assuming that this made a huge impact on our youth.

A huge impact. And when we think about that, that secondary trauma that occurs because there is a pandemic and kids, you know, not through any fault of parents, but really, you know, many received a lot of secondary trauma, as you said, because of maybe what they were watching on the news.

Right. We had the news on 24 seven for a time or the conversation they might have heard you having, you know, with your with, you know, your spouse or the fear that they could feel in you.

Right. And so that second kids take their cues on how they should respond to a stressful event from their parents. We know this from 911. From 911, right there is that trauma.

But then there was just those weeks of repeated trauma and repeated emotional upheaval that kids could sense and feel from their parents. And now we know, okay, we need to as parents be able to model as best as we can how to manage under those stressful circumstances.

Now, the pandemic wasn't just a one off event, though. I mean, it was years, right? I mean, years, you know, two plus three years of this. And, you know, unfortunately, I still have some families who are who continue to live in fear.

You know, I this and it's it's the young kids, right? It's the kids who they grew up. They were they kind of came to be toddlers during the pandemic. And that's all they knew up until that point.

Well, maybe they're too young and they don't remember a time before when kids were and when everyone wasn't masked, when you weren't afraid to touch things or hug people or, you know, scrub your hands before you did anything.

And so, you know, for for those young kids, often, you know, some of them, they really they're afraid, you know, to take off their masks. They're afraid to touch or hug.

They're afraid I have one little kid say, well, I don't want to kill grandma. Right. And, you know, those are some of the that some of the wording, the language that that the media was saying.

Right. That that we need to undo. And it's going to take some time. And I remember my first flight once things were really kind of lifted. And I took a lot of flights during the pandemic because my mother was sick and dying of cancer.

And so my first flight, though, when I did not wear a mask, I remember it was this you just have these flashbacks. It's like this, this PTSD of going in to the terminal.

And I was like, okay, I can do this. I could do this. I mean, it was it was just wild to watch myself go through this process of really, you know, kind of exposure therapy, right?

You know, being being okay with it. But now so many kids have and teenagers have not had to have that kind of exposure therapy. And they're still stuck in this fear.

And a lot of adults are, too. So I 100% agree with you that that's going to be a lot of the trauma that we need to. And then, of course, there was the trauma of how many kids, you know, lost grandparents and lost parents.

And, you know, so there's there is trauma all around. And so, you know, it's it's now, you know, folks like you doing the summit and, you know, all the trauma work that are really going to help us move forward with that.

Yeah, well, it's going to be very interesting, you know, 15, 20 years from now when these toddlers grow up and and they're adults and we see what happens then, this is going to be a very interesting human experiment, if you will, to see what happens.

I know this is a total sidebar to our conversation, but I think it's very important because parents do shape how our children react. And something struck me when you were talking about getting our kids off of their devices.

Now that the pandemic is over, well, guess who it starts with? It starts with us and our habits. And have we picked up a habit where we sit for hours in front of a phone or iPad or a computer just, you know, mindlessly surfing when we could be connected with our loved ones?

Yeah. Are we setting the pace? 100%. And when we think about that, you know, chronic psychological stress and the trauma, you know, just to really bring it back to that inflammation piece, what's what is fascinating is that stress.

We know that these stressful events and these you know, acess adverse childhood events can change our epigenetics so they can alter the path that our genes might take that then predispose us to diabetes, metabolic syndrome, heart disease, cancers later on in life.

But guess what? I mean, just like, you know, genes are not set in stone anymore. We can, you know, as we learn the tools to reverse and, you know, heal from some of this trauma, we can undo a lot of that epigenetic imprinting.

The sooner you start, the better, though, which is why it's so important for for parents and adults at any stage in their healing process to understand it's never too late.

It just gets harder the longer it goes. And so, you know, this this is now now is the time to work on it, right? Yeah. It never, never too late. I'm so glad you're bringing this up.

We have one particular talk on this summit by Jason Prall, where we're talking about neuronal so brain neuron and patterns and rhythms that can be shifted.

We can create new brain pathways if you are someone who feels like you've been stuck and no matter what you do, you can't get better. No matter what your children that you've done, all the things that your children, but they're still stuck.

This may be a worthwhile talk to listen to because it's reprograming those brain pathways as well. Your discussion about epigenetics reminded me of that.

There's so many things we can shift. We get into these patterns, right? And we can shift that. And I'm sure you use brain retraining and rewiring with your families as well.

Yeah, with kids. Okay. So I promised we were going to talk about some vagus nerve here. So we've been alluding to the fact that the gut and the brain are connected, especially in this mental health space.

So tell us a little bit more about the vagus nerve and kids. I always think of vagus nerve. You know, parasympathetic state is healing state, right? If you can't get there, then it's going to be hard to heal.

But, you know, it's one thing for an adult to decide, okay, I'm going to get into parasympathetic sympathetic state by doing Wim Hof breathing and by doing meditation.

But that's not as easy for a kid. You're not going to have a kid do Wim Hof, you know, survival, breathing for meditation, for minutes. So I have. Some very motivated kids.

But yes, it's a bigger lift for kids. Harder. Okay. So let's talk about the gut brain axis and why this is so critical to supporting this mental health crisis that we're in.

And then what you can do as a parent to help your child get into this healing state. Yeah. So the gut and the brain communicate via a two way information superhighway called the vagus nerve, as many listeners know.

But one thing that listeners may not be aware of is that 80 to 90% of this communication actually occurs from the gut to the brain. So the vast majority of communication is happening from the gut.

So who's in charge here? Right. We really need to think about that. In fact, our gut has its very own nervous system

that looks like the brain's nervous system.

## Pandemic Trauma and Epigenetic Impact

And it's actually larger than our brains nervous system. It's called the enteric nervous system. Some of the glial cells in our gut look very similar to the astro glial cells in our brain.

So I just learned this that I was fascinating that our guts enteric system can live without our brain. Our brain cannot live without our enteric nervous system.

I mean, that is wild, right? Well, that's the opposite of what? Everybody nuts, right? So what they taught us in biology. So we're calling the gut our second brain, but really like which is first, right?

And the gut makes the vast majority of many of our neurotransmitters, which we think of as brain chemicals, but they're actually gut chemicals that influence the brain.

So, you know, 80 to 90% of our serotonin, which is implicated in anxiety and depression and sleep, is made by our gut microbiome. Same thing with, you know, dopamine, at least 50% of all our dopamine, which is our attention, focus, reward, motivation, neurotransmitter is made by our gut microbiome.

More melatonin is made by our gut microbiome than our brain and acetylcholine, which is implicated in dementia, you know, cognitive decline. Most of that is made by gut microbiome.

And so we need to really be, you know, pay really good respect to the power that our gut microbiome have to make us feel well or not. And so and as I mentioned, psychological stress also can trigger leaky gut and gut dysbiosis, which then if you don't have the right bugs in your gut to make the right neurotransmitters for your brain, there's no way your brain is going to feel good.

So when we want to improve this, communicate, right, we call it vagal tone. And another proxy for that is heart rate variability, which some people have an aura ring that measures heart rate variability.

Teenagers love their woop, you know, for athletic performance and also heart rate variability. So more, more and more wearables are measuring heart rate variability because that is actually one of the best biomarkers of health in kids and adults.

And so, you know, one thing that we know about heart rate variability is when we're in a state of stress and when we are sick with an infection, our heart rate variability declines.

Right. And our have so when I listen to a child's heart over here on the left side, when I haven't take a deep breath in and out, I'm not just listening to their heart separately and to their lungs separately.

What I'm listening for is how do they work together? So as you take a deep, deep, slow breath in your heart rate, you should speed up. And then as you exhale slowly, your heart rate should slow down.

That's the variability of your heart rate, depending on whether you're breathing in or breathing out. I mean, in simple terms, right? And so when we can engage that vagus nerve and improve heart rate variability that can improve all of our markers of health, it improves inflammation, it improves our ability to detoxify.

I mean, it just it improves. So it reduces the risk of so many chronic diseases and so the way we want to stimulate that, improve vagus nerve function is, is, first of all, to figure out how to get out of sympathetic, right?

So When we have our sympathetic nervous system, which is fight or flight, you know, flee from, you know, the saber tooth tiger. We are almost in a perpetual state of sympathetic overdrive in fight or flight, like almost every day.

Right. And almost every moment of the day, there's a deadline, there's a school project, there's school drama, there's a soccer player. Now, we want to step back and know that not all stress is bad.

Right? That's another thing that we have not done well to really help ourselves. Right. And also our kids to understand is that stress can be really good.

Stress keeps you motivated. There's a certain amount of stress that we need to have optimal performance and optimal health is just when stress gets unmanageable too hard.

So by that it gets becomes inflammatory. So by avoiding all stress, that is not a good thing, right? As a parent, do not make your child's life, quote, too easy and stress free.

That is not the way to health. Okay. Well, a lot of. Us have done that. And. Yes, that's right. And I did that, you know, especially with one of my children.

We we Gen-Xers, we kind of like screwed up. We were trying to raise ourselves. We were the large kid kids. We hung out at home alone a lot. We had lots of chores.

We had lots of responsibilities. We overdid it on the yeah. Yeah, yep. So now we want to not just enable our kids with everything they want in life, but enable our kids with the tools to manage stress that comes their way.

So but that's really challenging to do. So we also need exercises that then it can engage our parasympathetic healing state so that we can spend more time there.

And when stress comes, we know how to manage the stress, get to sympathetic, but we also know how to bring the parasympathetic up and say, Hey, sympathetic, you've done your job, let's settle down again.

And so you mentioned, you know, Wim Hof, breathing, meditation, mindfulness, all of those. Absolutely, yes. And it can take a little while for kids to get into.

Right. There are some really cute Elmo for your younger kids. Has a YouTube video that teaches kids how to belly breathe. He sings a song with rapper Common and singer Colby Kelly.

So that's that's one way to kind of get into it. There are kids apps.

## The Vagus Nerve and Heart Rate Variability

The calm app has some kids apps that can help your kids get into a flow state and meditate before sleep or do some breathing exercises. Another app that I really like is the Oak app, like an oak tree.

In fact, a 12 year old is who showed me that app has some breathing and meditation apps. Now, one of the things because we know the gut brain connection, right.

What is fascinating is that when you engage your vagus nerve and improve heart rate variability, that improves your gut microbiome independent of diet.

So while I would love for kids to be 5 to 9 servings of fruits of vegetables a day and never eat out of a package and, you know, eat whole grains and, you know, no more than 25 grams of added sugar in a day.

Well, if changing food is one of the more challenging things to think about, you can improve your child's health, lower their inflammatory burden just by working on the vagus nerve and improving heart rate variability.

So I give concrete exercises for for parents to do. There's there's one easy one called the loving kindness meditation that improves heart rate variability is basically a gratitude exercise.

It's so simple. It's just for sentences that you repeat to yourself. You extend that loving kindness out to your family, your friends, your neighbors, anyone in the world, anyone you want to.

And you just say, May you be happy, may you be healthy, may feel safe, may you live at ease just for sentences. And we always start with ourselves. So I always say, Look, first, extend that loving kindness to yourself.

This is the most important thing, because some of the meanest, harshest words we hear about ourselves are the ones we tell ourselves, right? So you always say, May I feel happy?

May I feel healthy? May I feel safe? May I live with ease? And then you do the same thing for everybody else. I mean, what a great thing to do at the dinner table or at bedtime, right?

Yes, that. Right. And you know, the other thing I do I do use and I teach I do acupuncture in the office, but I teach parents how to do acupressure. And so there's a point cost Shan men, which is on your inner risk crease just on that down by your pinky side and that is heart seven or shin men that we know can help stimulate the vagus nerve.

And better yet, there are essential oils that have been found to improve vagus tone. So lavender, essential oil, sandalwood have been found in studies.

You've put a dab on your finger and just hold it right there. Right. There are also your points that I'll use. I'll put little they have little crystals or little seeds that you can put in to stimulate those points.

So those are more passive ways to engage your child's vagus nerve so that they can more easily get out of fight or flight and practice loving kindness or practice a five centered senses meditation with you.

I do also use I have I use an Apollo neuro device. It's a wearable vibrating device on my wrists. In fact, I'm wearing it right now. But that is one one that, you know, has been studied in kids, has been found to improve heart rate variability.

It's used in adults for mood and sleep and performance and for kids. It's been found to be helpful for attention, focus and calming. And so that's another way to improve your child's heart rate variability on a in a passive way.

So we need these things in a passive way that can get kids out of fight or flight so that they're more receptive to the tools that you're teaching them.

And and they know how to access them when they are stressed. So much valuable information here. Dr. Song We are coming to a conclusion of our talk and I would love for you to have the final words here on what you would say to our parents who are feeling like they're their child, their teenager, or their or their younger one.

That something is not right with what's going on with their mental health, that they feel maybe overwhelmed, that this is a lot like, how am I going to do this?

How am I going to get my child the help they need? I know you have lots of resources. You can't possibly see every child in America, but you have you have a way for for parents to get resources and to be helped.

And of course, you see kids in your practice. Do you see kids virtually, too? I do. But they have to be seen in the office, though, first. Yeah. Yeah.

Because you because you run a standard where it's. A brick and mortar. Yeah. Yeah. So, so but there is hope and you do put out a lot of content to really help our families.

So can you share some words of hope and also share with them how they can get connected with all the work that you put out in the world? And I know you have all kinds of stuff in the pipeline.

You're working on a line of probiotics for kids you're working on. I think you're writing another book right now. Oh,

no, I'm publishing my book is launching in May. So let me get down with this one first, Laura.

Okay. Okay. So, you know, it can seem like things are spiraling. And so this is where it's really it can be really hard for kids and teenagers to open up when they're feeling overwhelmed and when they're feeling stressed.

And I find one of the best places to have a conversation, interestingly enough, is actually in the car when you're driving and maybe they're the backseat.

Right. And then you just have a casual conversation, because when you're not saying, okay, look at me and let's have a face to face conversation, which is really overwhelming. So many times kids will be more more available, more open to opening up, and sometimes it's just making noticing comments.

Hey, I noticed that, you know, that you've been a little distracted lately and then just leave it at that. Right? Or it seems like you're not enjoying the things that that you used to.

I'm here to talk with you any time. Right. So you're making these noticing comments, but you're not grilling and then you're laying them? No, I notice and I care.

## Parent Guidance, Hope, and Resources

And if you want to speak about it, I'm here to listen. Right. And eventually, not always, but eventually some little nuggets will drop. And it'll be at times when you least expect it, like when you're, you know, going grocery shopping together and they drop a bomb and you're like, what?

What did you just say? Right? Is it safer? It's open. You're not in this tiny, intimate space. That that's when they're going to drop. It is when you got one out of the things going and it feels like it could easily be ignored and maybe they'll get away with not talking about it.

Yeah, absolutely. Absolutely. And there is. And even if your children are already on medications, they may need to stay on them. But many times you incorporate some of these tools.

It it's so much easier to see them thriving and resilient and happy in the way that you want them to be and even potentially wean off of their medications.

So always moving forward. And so I do have resources on my website that's healthykidshappykids.com, Instagram. I post a lot of useful information for parents that's healthykids_happykids and I have my book is called Healthy Kids, Happy Kids: An Integrative Pediatrician's Guide to Whole Child Resilience And that is coming out May 14.

So be on the lookout for it. I love it. I love that you well, first of all, I love that you just said we need to have I noticed this conversations. I think that would go a long way for adults communicating with adults as well.

I noticed. Yeah, I love it. I love it. And the fact that you've, you know, titled this book about Resiliency as well. Interesting. Earlier today, Ari our mutual Ari Whitten and I just did a fall talk on Resilience.

That's actually a passion and a project of his right now and it's fascinating and I'm just so thrilled that you're that you're teaching about resiliency because it's so critical.

Thank you so much for always being a yes to every project we do for always being the voice for parents and pediatrics on all these summits that seem to be overwhelmingly geared towards adults.

Right? Yep. And thank you for just tirelessly creating and putting work out there and taking such good care of your families and our families. I would say America's families, because you do help so many people, your reach and your ripple effect is wide and far.

So thank you. Thank you so much for having me. It's always an honor to speak with you. Until next time, everyone

take good care. Bye now.