Introduction to Neurons and Brain Fuel

Well. All neurons. Neurons are individual functioning units of the nervous system neurons either in your brain or in your vagus nerve, or in your peripheral nerve.

They have primary requirements for them to survive. The two primary requirements for neurons to survive is fuel and activation. They fuel for neuron is glucose and oxygen.

Your neurons are super sensitive to a deficiency or less optimal oxygen status or glucose status. Right. I mean, if your brain, if you go without oxygen for 4 to 5 minutes, the brain cells start to die off to be dead within just a minute.

Not having. That's how sensitive your brain cells are to lack of oxygen. Glucose is a preferred source of fuel. Now, some people say it's ketones. Welcome to doctor talks, the podcast where every episode leads to a healthier you.

Join us as we navigate the world of optimal health, uncovering groundbreaking strategies to conquer chronic disease. In each episode, we'll bring you the latest insights from leading health experts, medical innovators, and wellness warriors.

If you're seeking to transform your health journey, or if you're looking for answers to burning questions, you've come to the right place. Get ready to unlock the secrets of lifelong health and vitality.

This is Doctor Talks, real talk from real doctors on the issues that matter to you most. Welcome back to this week's episode of back to the basics.

Podcast Intro and Guest Background

This week we're going to focus on PCOS and gut health. So about 70% of your immune system actually lives in your gut. A lot of you that listen to me know that I talk about this a lot, and gut health is actually the foundation.

I feel like a functional medicine. I also have a lot of you that follow me that have hormone issues, whether it be PCOS, perimenopause or menopause. So I've found an expert today who's going to talk with us about gut health.

So Doctor Peter Kohn is an expert. He's an expert and manages chronic conditions using comprehensive approaches by merging the, exciting advances of functional neurology and functional medicine.

He's board certified in integrative medicine, functional medicine, and a board certified chiropractic neurologist. He's the creator of neuro metabolic integration, a virtual functional medicine program that identifies the root cause of autoimmune and other chronic conditions.

So he sees people virtually, which is something that a lot of you listeners may want to look into. Over 5000 patients from across the country have come to seek out his holistic approach.

That's changing the lives of those suffering from chronic conditions. He was born in Taiwan and he immigrated to America at the age of 13. He has a deep appreciation of eastern wisdom and Western advances in health care.

He believes in the God given ability of the body to heal and regulate itself. So help me in welcoming Doctor Peter Kohn to the back to the basics podcast.

Thank you so much for having me. Yeah, so we were kind of chatting before the show and you were kind of telling me, tell our listeners what is a board certified chiropractic neurologist?

Just so people know. Yeah. So with, just like in medicine, you have, specialists, like neurologists and cardiologists and, you know, rheumatologists in chiropractic, there are subspecialties in neurology, in sports medicine and orthopedics.

And we go through extra training beyond the regular chiropractic school. Take a rigorous board exam. And, in chiropractic neurology, our focus is on brain based and neurological conditions.

Specifically, this is born out of initially helping people with strokes, stroke, rehab. You know, certain region in the brain had a stroke, how to rehab the brain so that they can gain function back.

Also vestibular rehab in people who have like, you know, balance issues, maybe from concussion, a lot of concussion work that's actually being done in chiropractic, neurology and also obviously ruling out ruling in different type of peripheral neuropathy and nerve impingement.

So that's where chiropractic neurology kind of serve as a role to help with natural ways to restore normal brain function. Now this is different from a medical neurologist where in a medical neurologist they're looking for a brain tumor.

They're looking for a hemorrhage, a stroke. They're looking for something that they can visualize on a on the scan brain MRI scan, a hard lesion, we call it, meaning you actually see something that's busted on a, on a scan where a chiropractic neurologist, we might be helping people more with what we call a functional lesion, a lesion where there's loss of function but there's no visible structural issues.

Right. We're not seeing any pathological things on the MRI scan, but yet they're still not having function in that specific nerve pathway. This is what functional neurologists do by doing very detailed functional neurological exam.

And we do specific rehab to help them regain function.

PCOS, Insulin Resistance, and Gut-Brain Connections

And so neurology just for the listeners you know nerves there's lots of nerves that you have. And so one of the ways that I think this is fascinating is you do have a lot of nerves that innervate your GI tract.

Correct. Right. Absolutely. Vagus nerve. Yes. And so the vagus nerve is very important for your GI tract. And so I talk to patients about this a lot. You know, when you're nervous system is out of balance.

Your sympathetic your parasympathetic I see a lot of people with pots. So a lot of you guys that follow me you know pods eds I tell I talk to you about how your sympathetic and parasympathetic nervous systems are not working, how they're supposed to.

And that can really affect your your nutrition. Right? It can affect how your food metabolizes. It can affect a lot of your microbiome in your gut. And so I think, you know, this is very interesting to get your perspective on nutrition and gut health when it comes to neurology and hormone health.

And so it all does play together. Correct. It absolutely plays together. In fact, you know, I have trademarked this term, which I use for our programs.

And then things that I do called neuro metabolic integration back in 2009. Okay. So that's what, 15, 16 years ago. And I trademarked that term because I already saw in research coming down the pipeline where neurologically, your brain and your metabolism are intimately intertwined, meaning your brain's going to impact metabolic function and metabolism, the nutrients and hormones and immune function down the line, and then the gut and an immune system and hormones, in turn, affect the brain as well.

So it's very difficult to rehab someone with a brain injury if their metabolism and the nutrients that is in the gut health is not good. On the same token, it may be difficult for someone's got to recover completely if they also have

a concurrent brain issue that we don't rehab.

So this is where we treat a person both neurologically and metabolically, to get better results. So tell me, how do you think people with let's start with PCOS like hormone issues.

When you have PCOS, we know it's not just a hormone issue like I had a girl ask me this today. Like so you're saying I just have hormone issues? No, that's not what I'm saying.

PCOS is a conglomerate of things. Hormone issues are one of them, but it definitely has metabolic issues. Right. So we know that you have some metabolic issues with PCOS that increase your risk of insulin resistance and diabetes and high cholesterol, things like that.

So when you have a a disease or a disorder like PCOS and we know there's insulin sensitivity issues, there's hormone issues, how does that co-mingle and play with like neurologic issues in the gut?

Great question. I'm glad you went there. So, you know, when we when we PCOS, polycystic ovarian syndrome, one of the primary cause it's not the only cause, but the, one of the primary cause is actually insulin resistance.

Right. And insulin resistance is a problem with your metabolism of glucose. And the primary mechanism there is because usually because you have high blood sugar, either through dietary choices, but for other people is actually through an inflammatory issue.

Are you at where we have a lot of inflammation? Your body may secrete a lot of cortisol to dampen that inflammation. Then cortisol also has a function of raising blood glucose.

So then that higher glucose from the inflammation and the cortisol response can lead to insulin resistance just from inflammation alone. Even if you die, it's perfect.

So I see that quite often. So when you have insulin resistance then this leads to a upregulation of 1720 layers, which is an enzyme that converts, estrogen into testosterone.

So then PCOS patients often have high testosterone. They have these hormone imbalance issue. The high twitch causes facial hair growth, perhaps acne, acne or, male pattern baldness.

Waking not to mentioned, infertility issue. And then the hormonal issue, the pain associated with that. Now the insulin resistance can tie into this brain issue that we talk about.

So let's back up a little bit though, right. We talk about vagus nerve. Right now the vagus nerve is a nerve as you say. All nerve in the body kind of have similar requirements.

So what do I mean by that. Well all neurons neurons are individual functioning units of the nervous system neurons either in your brain or in your vagus nerve or in your peripheral nerve.

They have primary requirements for them to survive. The two primary requirements for neurons to survive is fuel and activation. Okay. Fuel for a neuron is glucose and oxygen.

Your neurons are super sensitive to a deficiency or less optimal oxygen status or glucose status, right? I mean, if you're breathing, if you go without oxygen for 4 to 5 minutes, your brain cells start to, you know, die off.

You can be dead within just minutes of not having enough oxygen. That's how sensitive your brain cells are to lack of oxygen. Glucose is a preferred source of fuel for the brain.

Now, some people say, oh, it's ketones. You know, ketones are the alternative fuel when you're in starvation mode. That's not the preferred source of fuel.

It's is something that you can switch into if you don't have enough food. But in a welfare state, you in someone who's getting nourishment on a regular basis.

Glucose is what the brain uses. So if you have blood sugar issues like insulin resistance or hypoglycemia or up and down rollercoaster blood sugar level, your brain cells are going to suffer.

They don't function that well. And when we say brings up, we don't want to mean just brain. We mean any neuron which include the vagus nerve. So now you may have a decrease vagal output.

Now just remember you vagus nerve. And really every single nerve cell in the body your nervous system is organized in a way that there's a feedback loop.

Right. So every neuron gets an input from some other neuron. Right. It's kind of like a big. So your brain's a big antenna. Pick up environmental cues through sight, touch, send sound.

And in that sense, your brain and your brain generates an interpretation of that to say, hey, this is food or this is danger, or generate a response for you to either go to your food, go to a meeting, or run away from threats.

And this response is motoric, which means is skeletal muscle response and autonomic response, which autonomic response? It's also a muscle response. It's just a smooth muscle response.

Either way, you generate a motoric response that gets you to move. You either moving your muscle to move somewhere, or you moving your internal organs.

And one of those internal organs is your GI tract. Okay. So then when we have this blood sugar problem, fuel delivery problem that's going to impact our brain function.

So what I'm trying to get to is PCOS has insulin resistance is the primary root cause mechanism. And that insulin resistance carry with a fuel delivery problem to your neurons all neurons.

So if you have fuel delivery problem with insulin resistance, what might you experience in your brain. Well, are you going to feel like sleeping after you eat fatigue after meals?

The reasons? Because when you have insulin, resistance to the glucose in your bloodstream cannot be utilized for fuel. So just kind of hangs around your blood.

That's why you have high blood sugar. And this excess glucose eventually gets transported into fat cells. And that process of converting that excess glucose into fat is very, very energy intensive.

It actually takes a lot of energy for you to convert glucose into fat. So at the same time, you're getting fat, more fat cells, getting overweight at the same time, you're also getting tired, fatigued.

So that drowsiness Thanksgiving post Thanksgiving coma is really for a lot of people is insulin resistance over a too much pie? They get insulin resistance.

That's a perfect example of what you feel like when you have insulin resistance. You get fatigue after you eat another symptom. With that is sweet cravings because you insulin doesn't work, so the glucose can't enter the cell.

So it just hangs around the blood. So when the glucose can enter a cell, your cells are starving of energy. So your body's giving you a signal. Hey jam more sugar in here.

So in hopes that some sugar get past the insulin resistance into your cells so you have some energy. So there's your sweet craving, especially after a big meal.

That's why again, after Thanksgiving or you go to a restaurant, you already had this huge amount of food. Does

their menu. I shouldn't, but yes. All right.

That's what happens. That's insulin resistance. So you're eating sweets, you crave sweets. You already had a lot of food. You still want to eat more sweets now that is the center.

And then the weight gain associated with that. Because all this glucose getting converted to fat, all of this, it's all wrapped up into the mechanism of insulin resistance.

Now the thing thing is all your brain gets impacted by that. Because if you're if the glucose is staying in the blood cannot enter the cell, then that means your neurons don't have enough glucose inside the cell because all in the blood, that's what it's called diabetes.

But when the glucose not inside the cell, your neurons become unstable. Okay. What that means is if you ever spend a quarter, a spin, a coin, when the spins really fast, it looks like it's not moving your neurons does better when this firing.

When it's working good, you're always using it. They do good when the neurons start to like, not work right because it doesn't have enough fuel or it's not activated for some reason, like it's inflamed or is injured.

Imagine that quarter spinning slower. Now you can see the quarter wobble. So your neurons, when it doesn't have enough fuel, it starts to become unstable in its function.

So then you don't have good brain endurance. You used to be you know, you ward loss. You can retrieve wards. Oh, what is that thing I can't remember? Like you forget things. You may even get clumsy.

Like some people with hypoglycemia. They get clumsy. They get. They get forgetful. They get hangry, they get moody. So these are. These are all things that impact the brain.

That's part of that insulin resistance that's also causing PCOS. So I can tell you that when I meet with women who have PCOS, often time there's a brain component to it.

And if you ask, you know, if you ask yourself, the listeners, do I have brain fog? Do I feel fatigue after me, or do I have a lot of sweet cravings? If you do, then that means your brain starting being impacted as well.

In addition to the PCOS problem that you have now downstream, then we have the vagus nerve.

How Vagus Nerve Dysfunction Affects Digestion

Remember, all neurons require fuel and activation. So the vagus nerve is made up of neurons. So if you don't have proper fuel guess what. Your vagus nerve is not going to function that good.

Then you're going to have decreased digestion because vagus nerve innervate the gut innervate not just innervate the gut. In what way? Motility. Right?

We talk about how our nervous system is a big ol feedback loop. It's all about stimulating movement so we can move toward or move away. Not it's not just muscular movement, but also internal organ movement.

And that internal more organ movement involves includes intestinal mobile motility. So if your vagus nerve not firing then you intestinal motility slows down.

That means food doesn't move through your GI tract as well. One of the main things associated with this is just constipation. But you might still go every day.

But maybe it's hard and dry because things are just sitting there so all the water gets absorbed out of the colon. So you got hard dry stools like grab a pellet.

Maybe you skip days. Either way is it's not good because you're not eliminating properly. That's going to cause a lot of toxins recirculate. But most importantly though, when you have decreased motility, you can't you can't have that downward sweeping motion of the GI tract to get the bug out.

So at any given point, we have germs and stuff that's transiting through our GI tract. And the reason we don't get gut infection because we have this downward motility.

So you just poop it out on the other end. So if you're constipated, you're more likely to get small intestinal bacteria overgrowth, small intestinal fungal overgrowth.

You get all these overgrowth of opportunistic microbes that we'll see on a GI mapped as could be because you have a lack of motility. Therefore you're not sweeping things down.

So that's really important to understand about vagus nerve and this motility issue. Now on top of that there's also the secretion issue. Right. Vagus nerve also innervates the accessory organs of digestion like gallbladder pancreas and the stomach to produce stomach acid pancreatic enzyme bile.

So if you don't have good vagal output you're making less secretions. Less secretions means less digestion. So then you get gassy bloated. You may have heartburn reflux from having low stomach acid.

This is all just wrapped up all together. So it's really not just a PCOS problem at this point. It becomes a brain and a gut problem. And and last thing I want to talk about before I pass it over to you, Cassie, is that the vagus nerve actually participates in inflammatory response.

So there's a cholinergic, inflammatory reflex, which means that when you have good vagal tone, the vagus nerve is firing. It actually dampens inflammation in the body, specifically in the liver, spleen and intestine.

This is called the inflammatory reflex. And, if you don't have good vagus nerve output, you lose that ability to dampen inflammation that's innate to you.

Kind of like we have our, you know, endogenous endorphins. Like when you get runner's high, you exercise, you get endorphins. Our body has this internal way of regulating inflammation through the vagus nerve.

If you don't have good vagus nerve output, your baseline level of inflammation is going to be higher than somebody else with a better vagus nerve output.

So you get more inflamed. And this can cause people to feel like achy and stiff is, oh, I'm just getting old. No, you're not getting old. You're just getting more inflamed.

And you're also this inflammation is not just in a body because body inflammation usually leads to brain inflammation because things cytokines can cross the blood brain barrier, either because the blood brain barrier is being breached or there's actually passive diffusion that can happen.

People think you have to have blood brain barrier breached for stuff to get through. There's actually passive and active diffusion that happens with cytokines that can cross even without a damaged blood brain barrier.

So what that means is when you have inflammation in the body, invariably you get some level of brain inflammation. And brain inflammation feels like brain fog.

Depression. Memory issues can focus like a motivation neurotransmitter deficiencies that lead to, you know, the dopamine issue, serotonin issue. So now we're talking about inflammation with the vagus nerve.

We're talking about the gut with all our brains. Sometime you can see this is a big problem. Brain immune gut. And it's all related to this endocrine problem that we think that we have when there's a whole system wide problem.

If you like what you've heard so far, it's so modern. Endocrine is now able to provide telehealth services in eight states, including Arizona, Nevada, Oklahoma, Texas, Ohio, Illinois, Michigan and Georgia.

If you would like to become a patient, visit our website at Dot modern endocrine.com backslash contact. You can also email us at hello at Modern endocrine.com, or call our office at 405 286 1571 to schedule an appointment.

Please note we no longer accept insurance for new patients. However, we do have customizable membership programs available. Your first visit will include a detailed intake, and lab orders will be provided to further assist us in developing your ten stages.

The Ultimate Health plan we do offer discounted lab rates with a nationwide lab service. And now back to the show. Yeah, so that was such a good, you know, explanation for people.

And I know this as a as a physician, I see this a lot. But you know to your point. So if you're listening to this and you have PCOS, I ask patients this all the time, you know, do you go to the bathroom every day like that's so important?

You have to go to the bathroom every day. You have to go poop and you have to sweat. And the reason you have to do these things is because this is how we detox, and this is how I kind of know how sick patients are.

Like, I was talking to this girl today who has, you know, pops and EDS, and I mean, she's she's pretty sick. And her main issue, though is insulin resistance.

And I know it because she goes back to the bathroom once a week. I mean, once a week. She's not digesting anything. She although is overweight. She's very malnourished.

And I know that because she, you know, and I want you to speak to this too. You know, if you're listening to this and you have PCOS, as you get sicker, people will tell you, oh, I eat less, I eat less, I have no appetite, I eat less.

Well, that's because your body has turned your appetite off because it's not able to absorb any nutrients. Right. And so you're so chronically malnourished actually, even though you're overweight, some people, some people are not.

But you get so chronically malnourished because your vagus nerve is so, you know, destroyed from the insulin resistance, from the chronic illness that whenever you are eating, you're not absorbing your nutrients.

And so what you are absorbing, your body thinks something's wrong, right? Like it's in a scarcity mindset. It tries to hold on to everything. It slows your metabolism down.

So you do actually gain weight, but it's not it's not good. And you're also, you know, typically losing muscle as this happens because it's hard to make muscle maintain muscle when you're not properly, you know, getting nutrition.

And so what I heard you say, which are good points for people, is, you know, our vagus nerve and our nervous system, it's very important for food digestion.

And when you have insulin resistance, you know, it's causing an issue with fuel delivery. It's a fuel delivery problem. But this insulin resistance, you know, causes you to be very tired to gain more weight.

But the thing I like that you pointed out, when your vagus nerve is not working, you don't secrete things well. So like I do a ton of GI maps. And what I will tell you when people with insulin resistance, PCOS, menopause, any of this, these people have low elasticity.

They're not secreting digestive enzymes. Some of them have really high static rate. Right. They're not secreting their their gallbladder is not working.

So they're not able to digest fat. They're not able to digest proteins. They're not able to digest carbs. Well then you can't absorb your nutrients, people.

The other thing that you see is they are very constipated. And like you said, they have this small bacterial overgrowth. They have fungal, they have Candida, they have H.

Pylori. All these things are growing. And it's because things aren't moving and they're not making secretion. So they're not able to digest their food.

And then to your point, this inflammatory response like I see this on GI maps a lot as well. Their Cal protecting will be really high which is an inflammatory marker of their colon.

Sometimes their EOP EOP will be high. You know, that's a sign of inflammation. And so you see all these things, but like putting them together and getting people to realize, you know, this is actually an insulin resistance and it's going all the way back to affecting your nerves.

I think is is really important for people to understand. Right. So and and not to like put a damper on things. But we've talked about this on this podcast.

So 93% of adults are insulin resistant in this country 93% a lot of people are insulin resistant. You know, I look at a lot of labs. It is very uncommon, like I might see one person a week with a normal insulin level.

I might, but even in those people that have normal insulin levels sometimes and you can maybe speak to this if they're thinner, if they're under muscled, they still have a lot of issues.

So even though their insulin may not be high when they do eat, they, you know, they may get blood sugar spikes, they may have issues taking that glucose, and they may feel really crummy after they eat.

Because if you don't have muscle, which is what helps you absorb a lot of this glucose and you're under muscled, you get a lot of the same symptoms. Correct? Oh, absolutely.

Yeah. And I think you brought up such a good point with this, people who could be overweight but yet malnourished and not getting enough nutrients or, and often when they're overweight.

What that means they have a relatively lower percentage of muscle lean muscle mass and lean muscle mass is really important because muscle not only help you to dispose of excess glucose.

But also it's a huge, profound source. And according to the literature, that word is profound source of inflammation dampening response. So the extra kinds of the mild kinds, these are signaling molecules that the muscle produce while is being contracted.

Right. So that comes from physical activity. And so it's very I'm very glad that you brought up the muscle piece, because this is something that I really focus on in my client population, because we tend to see people who are very deconditioned.

Inflammation, Brain Fog, and Blood Sugar Effects

They just, they don't feel well, so they don't exercise. I don't put that as a priority, when in fact exercise is actually non-negotiable, especially for the insulin resistance.

Now, there's different types of exercise. Of course, you know what we want to put on muscle. But I think for insulin resistance folks, the, the aerobic exercise is really important, right?

Because we need to get them to get into a, train the body to be very efficient and fat burning. So in that aerobic exercise, they're in a, you know, in a state of energy system where they're burning more fat for fuel rather than a

glycolytic state.

When they're doing high intensity, they're burning glucose for fuel. It doesn't mean that you cannot burn glucose for fuel, for exercise. You shouldn't do any high intensity stuff.

It's just that for insulin resistance folks, doing aerobic activity is extremely important as part of their exercise routine. Yeah, I completely agree.

And, you know, sometimes when you meet these people like these PCOS patients or people that are really deconditioned, you know, you got to meet them where they are.

So it's like, okay, fine, you can't lift weights three times a week. Fine. We're going to pick one day a week, but then the other six days, I need you to walk like you've got to walk.

We've got to start somewhere. But to your point, like you know, in our practice, we focus on muscle mass. And so I tell people who come to me, we do in body scans because that's just something where we can track muscle.

It's not negotiable. In my practice, we do it. We do it every month. If you see us or every three months and you would be shocked, well, you probably wouldn't, but a lot of people would be shocked at how under muscle they are.

And so I tell people, my goal for you is for at least half of your body weight to be muscle. Like, that's a pretty good goal, right? And I mean, I will have people that weigh 250, 300 pounds that might have 50 pounds of muscle.

To put that into perspective, for people listening to this, I weigh 130 pounds. I have 62 pounds of muscle. So there are people who outweighed me by double, who have less muscle than I do.

That is highly alarming. Like, and because again, it's it's your inflammatory response, right? It's how you, you know, like so we're recording this on Halloween.

I'm going to go downstairs when we're done recording this and I'm going to have a cake bowl because I love cake balls okay I'm going to have one capful.

But before I eat it I'm going to have some protein. So I've got some chicken that I made. So I'm going to eat some chicken probably a little bit of avocado.

Have some chicken parm chicken I'm gonna have some chicken, some avocado. I'm going to put a little bit of peanut butter on my cake ball because there's liquid protein in there. Right.

And then I'm going to take my happy about on a walk for 30 minutes, my dog and my husband, so that I can absorb some of that glucose into my muscle. And but you know, but I can get away with that because I have muscle.

And so that's what I don't think people understand either, is like, it's just so beneficial for, you know, your ability to, to utilize glucose. And and so I think that's one thing that I really want people with PCOS to understand, but I do want them to understand this like brain gut connection with their hormones as well.

So now that we've kind of told you guys all the, you know, all the great things about your vagus nerve and how it might not be working, let's give some listeners at least some like some tips.

So what are some signs of poor gut health? Like how can you know that you have really poor gut health? That maybe is affecting your hormones? Like if you do have PCOS?

We talked about constipation. Like what are some other things people may think like, oh well, maybe my gut health is not where it should be. I'm tired after I eat, I'm constipated. What else?

Yeah. So I mean symptom can vary, you know. And when we say gut health and to me, you know, people always

kind of confuse or they lump together the digestive organs.

Right. Because digestion to me is involves multiple organs. We have, you know, I mean, really, for me, digestion starts in the brain, starts with the vagus nerve.

Right. So we talked about vagus nerve innervation. So you got to prime that vagus nerve. You know if you're eating like you're rushed and you're eating when you're driving, you're eating when you don't have time to eat.

I mean, you're already putting that, you know, this parasympathetic state in a back burner. You're just eating on the fight or flight. That's not going to help with digestion.

So I say digestion starts in the brain. We got to eat in a relaxed state. And then mastication chewing the food is part of digestion, right? You got to chew your food because when I snakes, when I Komodo dragons, we don't swallow our food.

We got to chew our food because that increases the surface area. So we can like break it down easier. So you're not letting your stomach doing all the chewing, right?

So you chew your food and once it gets the stomach, then we have a stomach that's got to make stomach acid. And it's got to make intrinsic factor to help you absorb B12.

Right. So there's various things I have in the stomach. The fact that it makes acid is going to prime the pancreas in the gallbladder to be able to release their secretions, kind of like a step by step process where one thing triggers another, triggers another.

So I think of digestion like kind of from North to south. Okay. So like is there a vagus nerve issue. So like yeah gassy bloated okay. Then I will start with like okay.

What other symptoms of vagus nerve dysfunction do you have. And if there's a lot there then maybe that's what we start. Then we go down the next step okay.

Do you have a lot of stomach acid problem either low stomach acid or too much stomach acid. And the cool thing about that is each digestive organ like stomach versus pancreas versus gallbladder versus small intestine, because symptoms are kind of like unique, right?

There's like different things that are different about a stomach dysfunction like heartburn, reflux that show up different than the gallbladder dysfunction where you don't process fat very well.

You probably have hormone problem talking about hormone problems. I mean, the gallbladder is really part of your, accessory organ to digestion, right?

So then it's participates in digestion. So if your gallbladder is not functioning right, you're not going to secrete bile properly. And bile is a very important component in hormone clearance.

So if you can't clear the hormone, then the hormone just recirculate and you end up getting estrogen dominance or some kind of receptor downregulation problem because you have too much hormone that's building up.

So so the way I see digestion is I'm looking at each individual part, see what the breakdown might be. And we support that specific area. Excuse me. Now if we're talking about gut gut health, if we're talking about gut microbiome then obviously that's going to be the, you know, the lower GI in the large intestine.

And certainly the gut microbiome issue can manifest differently for different people, although we often think of like constipation. But, you know, for some people it's it's loose stool because they have fast transit time because there's some irritation there in the large intestine.

Because of this, biotic states, they have too much bacteria. Either friendly or unfriendly. Just remember, your immune system is always looking for things to kill.

It's always trying to. That's the job of the immune system to kill pathogens. And the pathogen is looking for. It's both friendly and unfriendly, although it can tolerate the friendly bacteria better.

But if you have an overgrowth of the friendly bacteria, that can also elicit an immune response where your immune system kind of like trimming weeds, you know, or cutting grass.

So I, I love green grass, but if you're grass growing like to where you can't even see yourself, so you might want to cut that grass, your immune system is going to cut the grass if the even the beneficial bacteria too much.

And really, the definition of this biotic state is that you have an imbalance of the normal distribution of bacteria, this could be too much good guys or too much bad guys, or not enough good guys and too much bad guys.

So the point is, it's all about balance and we don't have that balance. You tend to create an inflammatory state for your immune system looking for something to kill.

Not to mention the gut bacteria produce a short chain, fatty acids and various metabolites. That's a very important in signaling to the immune system to create more immune tolerance, to dampen inflammation, serve as fuel in the colon, clonal sites for the intestinal cell to regrow themselves.

So the gut microbiome is truly important. Now, as far as regard to hormone, the microbiome serves a role in regulating the sex hormone binding globulins.

It serves a role in helping to, again with hormone clearance. When we say hormone clearance and detoxing excess hormone, we used to think liver, gallbladder.

But now when we talking about hormone clearance we're thinking also the gut microbiome. Like that's another piece for clearing hormones. So the gut microbiome is going to be really important for balancing your hormones.

So definitely that's something we want to look at. Yeah. And the other thing I see a lot of and I'm curious about you. So a lot of my my women with PCOS are just hormone issues in general.

When you really drill down into these people, most of them have sleeping issues, right? So they're not sleeping well. But then a lot of them are just like these.

I call them stress balls. Like they just worry about everything. They're always stressed out, you know, they're just about their job. They're stressed about things that they can't even fix, you know?

And so I find this huge correlation too, with stress. Obviously it affects your hormones. So and I tell my women this all the time, like if you're just walking around stressing about things you can't fix anyways, all you're doing is driving your cortisol up.

And when you drive your cortisol up, you're lowering your progesterone. And progesterone is a beautiful hormone that God gave us so that we can tolerate our children, our husbands, and sleep like.

I mean, it's just that's why we have it. It helps our mood and helps us leave. And you are just walking around killing your progesterone. And then, you know, when your cortisol goes up, your insulin goes up.

And when your insulin is high, then it kills your estrogen. And when you're estrogens low, you know, then that kills our gut. So there's this huge correlation between estrogen and, you know, your, your microbiome.

And so I wonder if you see this as well. But I tell my people with PCOS, with anyone, if you are chronically stressed and you kind of you talked about this, not only does it, you know, mess with your sleep, it messes with your cortisol.

It messes with your estrogen, but it messes with your vagus nerve. And so if you walk around stressed out every time you eat is actually going to affect how you eat as well.

And I find that some of my patients that are the most stressed are the ones that have some of the worst GI symptoms. I'm so bloated, I'm so gassy. It doesn't matter what I eat, I'm bloated and I'm gassy.

Sleep, Stress, and Alcohol's Impact on Health

Well, that's because like you said, when you sit down to eat, you already had your nervous system so out of whack that it's not going to accept any of that food that you give it, like it's too busy shunting blood flow somewhere else because it thinks you're actually like something's wrong with you, right?

Like you're in danger and so then it's not going to actually absorb your nutrients. Correct? Yeah. I mean, I'm so glad you brought up stress. And really, this has a lot to do with that insulin resistance pieces.

It's more oftentimes connected because when someone has insulin resistance, which is again the main driver, the main cause for PCOS is insulin resistance, right.

Or at least going to be involved in people with PCOS, even if it's not the only cause it's usually involved. So you have to ask the question, what causes insulin resistance?

And it can start with lifestyle choices, right? Often it's all starts with lifestyle choices, right? Your choice to eat, the cake pop classic keto and vegan and gluten free.

By the way, it's a vegan gluten free cake. Well, and I'm only having, like, goodness, I was worried first again. So, so you're making me feel bad about, I'm just messing with you, but, you know, it starts with lifestyle choice, right?

So, like, eating cake ball. By the way, if you're a doctor, Cassie, and you exercise and you have 62% muscle mass, it's not a problem for you. But it's more like you take it first.

62 pounds, 62 pounds of muscle. Okay. But if you if you're if you're eating cake ball more often than not as a habit, then that's when it becomes a problem, right?

And you're not having enough muscle. You have other issue that's associated with it. So but the insulin resistance issue it's usually also associated with sleep problems.

So for example if you have insulin resistance you tend to run higher blessure there. And that's a higher blood sugar may promote more these inflammatory issues.

And just so you know, if I'm a brain perspective, your brain has sensors for inflammatory cytokines, specifically in your midbrain, Meese, and cephalon.

The midbrain is a region in your brain that actually where the sympathetic fight or flight response starts. That's like in your missing cephalon. And so that that area, because it detects fight or flight means detects danger.

It has chemical sensors for inflammatory cytokines like interleukin six. So that means when you are very inflamed, you're going to have a higher level of circulating inflammatory cytokines.

And that area in the brain is going to detect that the fact that you're inflamed is going to trigger off a fight or flight response. So this means that you can literally have a fight or flight response that doesn't start with stress.

That starts with a chemical problem, like you're inflamed or having a blood sugar problem. So this is why everything's connected and you have to look at a holistically.

So now when you trigger off a fight or flight response, then you're not going to sleep very well, right? Because if

you have a fight or flight response, I mean, tigers chasing you or chewing you, your body's not going to put you to sleep if it knows the tigers chasing you, so it's going to keep you awake.

So oftentimes insulin resistance associated with trouble falling asleep. And then people who have insulin resistance usually have reactive hypoglycemia.

And then the hypoglycemia causes them to have trouble staying asleep. So then you get this problem with a circadian rhythm which further messes up the cortisol.

Because circadian rhythm controlled by the hippocampus, which is an area in a temporal lobe and the the temporal lobe in the hippocampus, regulate your circadian rhythm, the sleep, but also the blood sugar tend to damage that part of the brain very much so, as well as the cortisol damaged the hippocampus very much as well.

So then you have this vicious cycle of more inflammation, more sleep problem, more blood sugar dysfunction. So, so sleep is vitally important. And time the sleep can have a, a lifestyle issue where people just staying up too late when they shouldn't be or they're working too many jobs and they they need to take more break.

But there could be a biochemical reason or neurological reason, even like fight or flight response that's overactive, not enough vagal tone, or they have some kind of blood sugar issue, an inflammatory problem that's thrown off their sleep cycle.

So another thing I see with sleep cycle hormones. So if your hormones are out of whack when you do go through menopause, or if you know you have PCOS and your hormones are very out of balance when you have low progesterone, low estrogen, low testosterone, it can definitely affect your sleep sometimes your ability to fall asleep, but definitely your ability to stay asleep.

So that's one thing that I find a lot. I agree that like this glider fight or flight response, you know, most people are on their phone, on their computer, whatever.

And then they get in bed and they're like, why can't I fall asleep? Well, you've just been like completely, you know, messing your brain up. You need to work on some meditation, a bath or something like that.

And then the third thing I want you to speak to this because I've said some things and I've made some people angry, tell women out there, especially what alcohol does to their sleep and what it does to their nerves as well.

Like a lot of people say, well, alcohol calms me down. It allows me to go to sleep. Probably not. Maybe. But I guarantee you then 3 or 4 hours you're going to wake up because I'm asking you go ahead.

What does alcohol do to your sleep? Yeah. And first of all, you know, when people say, hey, alcohol makes me more, you know, relax so I can go to sleep.

It may be true for some people, if that's what they're noticing. That's true for them. That does make them relaxed and able to go to sleep. But you know, it's a it's a it's a symptom treatment.

Right. It's kind of like saying like, hey, when I smoke crack cocaine, I feel better. Yeah. But that's not a that's not a life advice I don't give to people.

Do not smoke crack cocaine. That is not what we're. Yeah. Don't do any substance in fact. But but you know the cocaine basically. I mean cocaine alcohol.

Right. Speaking of alcohol, you know, alcohol, ethanol, ethanol is, is a neurotoxin. Okay. So your brain is not supposed to be soaked and saturated with a neurotoxin like ethanol.

And that's what you're doing when you drink alcohol. And a long term exposure to alcohol in some research has gone as far as to show that no amount of alcohol is really safe.

Any amount of alcohol will accelerate this process of neurodegeneration, because when you give your brain a poison, you're killing off more brain cells.

And brain cells are post mitotic, which means that they don't go through mitosis, which means you don't make more of it. Now, some research shows that you can make some new neurons, but the amount that you can make from like doing exercise or doing different things is is not clinically relevant.

It's not enough to like reverse an Alzheimer disease. So it's all about prevention, right? It's all about like preserving as much brain function as possible.

And alcohol is definitely a neurotoxin that can impact that. And alcohol does a number on your sleep as well. Primarily it's because it's going to it's going to impact your blood sugar, right.

When you drink alcohol, your blood sugar is straight up sugar, right? Sugar alcohol. And so basically it'd be the equivalent. And most people know to, you know, hey, you know, don't eat right before you go to bed.

Because if you eat a big meal or too much sugar or whatnot before you go to bed, you're not going to sleep very well, because number one, you have to digest.

Number two, you throw off your blood sugar. And by the way, your blood sugar really is one of the the key things, along with sunlight and other things that drive this, you know, sleep.

So if you drink alcohol, especially if it's close to nighttime, you're really throwing off your blood sugar. And what it does is creates a high blood sugar initial response followed by a crash, a low blood sugar response.

The crash, the low blood sugar is what often wake people up in the middle of the night. And then. So that's going to be a problem. And on top of that, that alcohol really damages your gut microbiome is unequivocal that alcohol damages the gut microbiome.

So you gonna impair your ability to produce all these various metabolites to help you dampen inflammation that may have impact on your brain, that may have, impact on clearing your hormones.

So, you know, I think there's a difference between abusing it and socially drink. And I think some people think that socially drink is like two drinks a night.

One drink a night. Clinically speaking, I see that even when people have one drink every day and they've done that for years, they'll come in with cerebellar degeneration.

Like we'll see it on their finger to nose tears. We'll see it on their just outgoing manager proprioceptive tests. We'll see that a fine motor coronation has gone like I've I've seen it where people just say, oh, I got one drink a week, one drink a day.

Now, maybe they're not. They're lying about the one drink a day, maybe they're actually drinking two, but they just tell me one drink a day. But I see the cerebellum degeneration.

Whereas like the field sobriety tests, like you haven't drank, but you failed. Failing this field sobriety test anyways. That happens. I believe, at a faster rate than people think.

I think people can tolerate less alcohol than they think even they can tolerate it. The effect on their brain, on the nervous system, on the hormone, the system it's going to it's going to compound over time.

So it's going to have an effect. So my advice will be as little as possible. Maybe on the day you're married go ahead. Yeah. And the other thing like I will tell you too from a woman's perspective, you know, in her mid 30s, like what alcohol did to me, what I realized was I could fall asleep. Yes.

I would wake up at 2 or 3:00 in the morning just sweating profusely. I think I woke up sweating because my blood sugar was tanking. Like, to your point, I used to think it was, well, I can't detox the alcohol, right?

So I'll just drink less. That's what I used to think. Well, I'll just have one last drink. Well, I'm here to tell you if I have half a glass of wine, it doesn't matter.

I'm up at 230, sweating profusely. It doesn't matter what I drink. And so that's why to me, I'm just like, whatever. It's not worth it anymore. And you sleep so much better.

And I do know that people say, you know, well, I can't go to sleep without without a glass of alcohol, but. And then the other thing was my gut. I will tell you, like I completely agree with you, alcohol is so disruptive to your gut microbiome.

So if you're working with the provider and you're trying to clean up your gut and by the way, that's expensive. Like if you are really doing a true GI protocol, right, it's not cheap to do the test is not cheap to do the supplement.

So like then if you're just going to go in and give yourself alcohol on top of that and destroy what you're doing, it's just it's kind of silly, you know, and I, I really think and I may be way off, but I think in ten years people are going to look at alcohol like we look at cigarets now.

Right? In the 80s, when I was a kid in the 90s, everyone smoked, right? It was just you did Doctor Smith, like, maybe not in the 90s, but 70s. 80s, like everyone smoked.

Now people realize like, oh my God, it's actually really bad for you. So if you smoke, it's almost like people kind of shun you. I really think that's what's going to happen with alcohol, because right now you go out to dinner, right?

And it's like, drink alcohol. But if you notice this younger generation of kids, I kind of like it. They don't really drink like a lot of them. Like, especially like whenever I was a kid. Right?

I don't know if you've noticed this, but like 19, 20, 21 year olds, they're into mocktails, which I think is really cool. So it's like we have this new generation coming around with alcohol and to your point, like, I think it affects your nerves.

I know it affects your GI tract. And as a woman, maybe not so much as a man, but I know as a woman it definitely affects your blood sugar and it affects your sleep.

It makes you wake up hot. And and so I have this conversation with women a lot, like I can't sleep, I can't sleep, and I'll say, well, how much do you drink?

Well, I have a glass of wine or a vodka or whatever every night. Well, have you tried to stop it? We'll know that, silly. I've done that for years and I'm like, well, okay, well, they may not be sleeping at the very fact that they're drinking a glass of something, right?

That's the very reason why they're not. Now, if they say that, hey, I can't sleep without drinking something, well, that's a big step. We got to go fix that.

So then we can get you to the point where you don't have to drink and still be able to sleep. So it's just a clear indication that there's some dysfunction that we need to fix.

Not a not more reason to continue to drink to mass, to symptom. Yeah. And to your point, alcohol is mostly sugar. Right. So then that's probably not helping insulin resistance either.

So it's not only not good for your neurons, but it's not helping your insulin resistance. So just wanted to throw that I wanted your opinion on that. I'm not you know I'm not saying, you know, you can never have a glass of wine.

I'm just saying that I think alcohol is something that's very loosely thrown around in this country, like, oh, it's just one vodka. It's just one, you know?

But every day it it adds up. I think culturally, though, you know, certain culture like Italy, you know, they drink wine, French, the French drink wine.

So we associate that, you know, like, hey, you know, they drink wine there. Okay. Why is that? I think there's a difference, though. I think the diet and lifestyle is very different from ours.

They eat a lot more vegetables, like Italy, the Mediterranean diet. The food doesn't, is not sprayed. And it doesn't have as much chemical. They also get a lot more physical activity.

So I think they have some room to play with there. That doesn't mean like if you abuse two glasses of wine every day that it's not going to add to a problem.

I think it will still do it for them in Italy and France. But I think they have a lot of other things going for them as helping to offset that. I think also to your point, the younger generation, they may not be drinking a much, but I think they're like moving on to part as a nation.

Unfortunately, yes. That okay. So we kind of got derailed for a second, but I wanted your opinion on alcohol. So prebiotics, probiotics, should we do this to support our hormone health and improve our gut health.

What are your thoughts on that? Should we do that? Should we just really focus on diet? What are your thoughts? That's a great question. You know, I think, my my opinion is I always like people to make lifestyle change first, if they're not currently getting enough vegetables and fiber in their diet, then I like to start there.

If they have trouble processing fibers because of Sibo, because of enzyme deficiency or even vagus nerve issue causing the enzyme deficiency, then I will fix those reasons to get to the point where they can digest those things.

In the meantime, we might give them supplements like enzymes and so forth, so they can actually, in the meantime, still absorb things as far as you know, probiotic and prebiotic.

Again, if you eat plenty of fiber, you're getting the prebiotic. There's a case for there is case for someone to take a probiotic supplement. Maybe somebody just can't eat that much vegetable because they are currently sensitive to a lot of vegetables, or they have Fodmap issues and they can eat as much diversity as they need to.

So then we'll give them a prebiotic so that there's enough stuff for the bacteria to work on to produce the post biotics. As far as probiotics, you know, I'm kind of mixed on that meaning obviously in research, there's certain species of probiotic that are beneficial for even hormonal function.

Right. Like your beef, lacto bacillus arum, your daffodil bacterium. Long, these are bacterial strains that has been shown to have some benefit in improving hormone clearance and just, you know, general hormonal health.

But I don't think it's because the bacteria is making hormone for you.

Probiotics, Postbiotics, and Gut Support Strategies

Right. The bacteria just modulating there are signaling molecules that are modulating things in your gut and therefore your immune system. And therefore when you impact gut and immune system, you're impacting the brain and the hormones because everything's connected.

So it's more like an indirect effect upon an effect, upon an effect rather than, oh, the probiotics and solve all your hormone problem. That's my opinion.

Yeah. So I try as much as I can do to go upstream. Right. If they're not sleeping because they're drinking a glass of

wine every night, then I get them to cut down on their glass of wine.

They're not exercising enough. I get them to exercise more. They're being really stressed. I try to teach them stress management strategies that their blood sugar is out of balance because they're insulin resistant.

They're having too much cake balls. Then, you know, we got to reduce that right. So so I try to go off string as much as I can. And then there's a dysfunction.

Like right now they're just not making enough enzyme. Let's take some supplement with enzymes. Right now they can get enough fiber in the diet. Let's give him prebiotic even probiotics.

But what I really like to give them is post biotic, you know, a short chain fatty acid. I think that, is very helpful because we're giving them directly the metabolites that we're interested in.

Right. The whole reason for the probiotic, a big part of it, not the whole reason. A big part of it is that they produce short chain fatty acid. And these metabolites that are produced by bacteria actually serve, as, you know, dampening inflammation in the gut.

They help it is sort of a signaling molecules. They help with, you know, just providing fuel for the colon or sides. So, so I'm more in favor of giving them post biotic because some of them have such a despotic gut that giving them probiotic doesn't necessarily help, because a lot of these probiotic don't actually make it down there alive.

I do have to survive the harsh environment, the GI tract, by the time we get down there, most of these probiotics are already dead anyways. That doesn't mean they don't serve any purpose.

Even dead probiotics still serve a purpose because they can still serve as signaling molecules right in the environment. The fact that there's some bacterial cell wall there, then the other bacteria say, hey, what's going on?

Says changing how they're modulating. So I think that still serves a purpose. But not in a way where we think, oh, we're going to take a capsule, a probiotic, and want to recall innate, the entire gut microbiome.

I don't think that's how that works. So therefore I'm more in favor of giving them post biotic just directly go after the end result. And also that has a lot of other immuno modulating benefits.

So that's what I tend to do. But again, for some people probiotic just works like a charm. So it's almost like it's not like a prescriptive protocol ize everybody do the same thing.

It's going to be based on individual responses, maybe based on the history, you know, how much antibiotic they have use. You know, the GI map test result.

Maybe all of that will give us a picture of whether a probiotic will be beneficial for them. When you say post biotic, you're talking about butyrate, correct?

Like short chain. Yes. Yeah. Yeah. So butyrate. So like we use a lot of butyrate builder. I agree with you. What I find is that again, interestingly enough, the people who have the most stress when you look at their secretory IGA levels, they're terrible.

Right. So that's the immune system of your gut. And I tell people like the good bacteria kind of live in like this mucus layer of your GI tract. It's kind of gross.

But I tell people, think about your stomach as like a big fat straw or your whole GI tract, and then figure, think about that big fat straw all being covered in this nice mucus layer like a big blanket.

And that's where the good guys like to hang out and live, like in this blanket, kind of like a hammock. And then when they're ready to eat, they kind of stick their head out into your GI tract as food comes along and they pick up

the fiber in what they want to eat, and then they go back and lay in their hammock.

When you don't have any of that hammock surrounding your GI tract, when your secretory IGA is low, it's hard for those good guys to live. They don't have any mucus to live in, right?

And so you can hammer yourself with all the probiotics you want. You can take 20 million, 200 billion, 50 million. It doesn't matter if you don't have the environment for those guys to grow.

And so that's where, you know, the environment is important. And that's why I think stress is so important too. Like I see some people and I'm sure you've seen this like secretory IGA is of less than 210 on GI maps, which is like you even know how low it is because that's just as low as they'll they'll tell you.

Right. And these are the people, two that have the bloating and the gas and are stressed. And so I'm the same way you are. I have people who come in and they say, well, I've taught a functional medicine doctor.

And they said, all I need is a bunch of, you know, probiotics because my all my good bacteria are low and you look and they have no secretory IGA and they have no digestive enzymes, and you can tell their stomach acid Zarek and I'm like, okay, well, have you been taking, you know, these these, these probiotics.

Yes. Are you better? No. Well, it's because they don't have any I mean, it's not helping is my point. And so to your point, like changing your diet, I think is so beneficial.

And yes, I love butyrate. I think giving somebody some butyrate because it is hard to eat enough fiber. But, you know, if you're listening to this and you are having these symptoms, you have got to incorporate fiber back into your diet.

Like, I don't care how you do it. I don't care if it's apples, I don't care if it's beans, I don't care if it's vegetables. Like, but you've got to shoot for trying to get 35g of fiber, and nobody does that.

When you tell people that they look at you like you're you're crazy, right? Like, how do you eat 35g of fiber? But, you know, to your point, I really think that that's something people really need to work on is fixing their diet, because then that helps a lot of this, right?

Like, and this is something you can do long term because God forbid something happen and all the factories blow up and we can't get you butyrate, then what are you going to do?

You're just going to eat good food, right? I mean, so I do I mean, I agree with you, probiotics can be good for some people if you're taking an antibiotic or something like that to kind of keep that microbiome from maybe dying off.

But ultimately I think you need to look at post biotics and you need to look at food. And I think you need to look up more upstream. And that's kind of how I always think.

I'm always going more upstream. Like if you don't have enough beneficial bacteria, you got to ask why instead of just shoving some pills with a bunch of bacteria and ask, why is it not there in the first place?

All the time is insulin resistance is inflammatory, foods is stressful, lifestyle is lack of. Yeah. Antibiotic stress. Yeah. Toxins. Yeah. So if we go upstream usually that's going to give you better result.

Then taking a probiotic but still living in a toxic lifestyle. Correct. That's like a Band-Aid. That's like it's like yeah, it's trying to Band-Aid, you know, instead of turning off the kitchen sink.

It's trying to just like, you know, Band-Aid something. And eventually that kitchen sink is going to overflow and you're going to have a big mess. So you might as well just fix the leak.

You know, instead of mandating it. So what dietary changes can enhance gut health and like, help promote

hormone balance. We talked about fiber. We talked about no cake balls I get it.

No cake balls. But like, what else? I'm ruining your Halloween. You know what? It's, So fiber I absolutely like I vote that is number one. You know, I think people sometimes say like, are you kidding me?

It because they think it's like it's too simple, right? Can't be just fiber, but really is fiber. But it's, you know, the quality of fiber, right? You want to get it from vegetable plant matters.

People often say like, well, I eat this crackers got fiber in it. We're not looking for a gluten and sugar laced cracker as your source of fiber. Right.

So the type of fiber is important, usually from plant matters. That's number one. And secondarily, food wise, I think it's not really even a food. It's more like your macronutrient balance.

We talked about insulin resistance is a central topic to PCOS. So it's really like how much carb are you eating versus fiber versus protein versus carbs.

And I think a lot of people, they may not be eating enough protein. They may not know that. Right. And unless until you become more aware of it and start looking into a measure, it, they may not know that or they may not even know it's important to eat protein.

They said, well, I'm not currently lifting weights because I'm not feeling so good. So since I'm not lifting way, I don't have to eat protein like, no, you absolutely need to keep the protein intake up.

So that's really important by keeping the protein intake up and the fiber intake up, then you tend to eat less carbs so that it's going to have a consequent improvement on your insulin resistance.

So, so I look at this macronutrient balance a lot because sometimes people just go on this really super strict elimination diet, and they're forgetting to get balance into their diet.

So I believe in balance, right? I believe like, okay, what can you do on a sustainable basis to maybe a short term need to go on a strict elimination diet for a short period of time to, to change something to, to affect the change in your physiology.

But once we're done, what are we going to do for the rest of your life that we can set you free so that you can just go live your life and eat in a in a sustainable way?

So I will say that's my top two. Now, you know, number three might be might be cruciferous vegetables, you know, get the sulfur and you know the indole three carbon oils to help with supporting hormone detox and binding.

So that might be a number three. But, you know, it's I mean, again, some people might have trouble with cruciferous, you know, it may bloat them, but, you know, that's where cooking and you know, cooking methods, you know, if you steam it better than raw because you may not digest it raw.

So there's different ways to get around it. But if you're having a lot of bloating issues with cruciferous vegetables, then my concern is that you obviously have some some issue with your gut.

Right. I think you should be able to digest this. And so, yeah, I mean, I'm not saying like switch your entire diet and eat nothing but broccoli and cauliflower.

You're probably going to have some gas, but you should be able to eat brussel sprouts and broccoli and cauliflower, you know, in smaller amounts and not just have horrendous stomach pain.

If you are, then that's kind of a sign, right, that you probably need to clean your gut up. Right? Like we need to your stomach needs to be able to digest these things.

And so obviously you want to work with a provider, but that's a good sign to me that you need a stool study.

Diet, Fiber, and Digestive Enzymes for Hormone Balance

And we need to start slowly incorporating some more fiber into your diet and having your health in your body to be able to process these foods. I agree.

Yeah. I think, I think the digestion piece again everything think of stream right? If you have digestion problem, think start with vagus nerve and then stomach and work your way down.

But you know, the gut microbiome obviously is really important this piece. But the way you're going to affect a gut microbiome is by looking at more upstream problems and then feeding it properly as well.

And I think the point you brought up which really hits home with me is like the stress and thinking about like setting down to eat to your food. Don't be rushed.

Like you know, I'm a provider, you're a provider. Most mornings I'm like eating my breakfast on the way to clinic because I lift weights in the morning.

And I know if I don't eat on the way to clinic, then I won't get to eat. And then I don't get, you know, then I don't get my protein and then I'm hungry.

But like, you know, that really hits home with me, too. Like, you know, if you're eating while you're moving and walking around, like, that's probably not a great way to start your digestion.

And then, you know, especially if you're listening to this in your provider or you're somebody that has a busy lifestyle like that and you are eating on the way to work, and then you're going straight into work and you're at it all day and you've got meetings back to back.

I mean, your stress level is going to be high, so that food that you just ate is probably not going to digest very well. Right. And I actually just got back from a week of vacation, and I was just sitting here thinking, while you're talking about this and like, I don't really have stomach issues very bad.

Every now and then I'll eat something. I'm like, oh, but last week when I was on vacation and I could, like, eat when I want, I could sit down. I could cut my food up into a million pieces.

I had dinner with my husband for an hour at a time like you do feel different? Like you're. It just. I felt different. Like my stomach felt different. My, you know, you're just less.

It's interesting, like when you said that it kind of all made sense to me. You know, there's some. Yeah, subtle differences in how you feel. And then that that's a big you know, that for some people that's a big difference.

For them it's a big indicator. If you're relatively healthy, that might be just what Doctor Cassie just mentioned. Like, oh, I do feel different. But day to day she's not having any issues.

Right. So I think it's going to be very different. Some people can tolerate it. But in general, of course, you know, we all like to be on vacation all the time.

And but like we can also make a and choice to get more margin in our life and plan in more time to sit down and have a meal, with our loved ones. And if we do that, I believe the world will be a better place.

It definitely would. And here's the other thing that I've started doing since I started this podcast, because so many people talk about it that I think is really awesome, and it segways me into my next question.

So my next question is how does stress impact gut health? We've talked about that and hormone balance. But then

what can be done to mitigate these effects.

And so one of the things that I have done after talking to several people on my podcast is I make a conscious effort throughout the day, especially when I feel like I am becoming stressed.

Although I have done like, I have an amazing therapist and I've done a lot of meditation, and my stress used to be like a 12 out of ten all the time. And I would say now I walk around at a baseline of three and you might get me to a six if you really get under my.

But like, I just don't stress like I used to because I know how bad it is for you. But I will tell you that what I have done, which I think has helped a ton, is like when I feel like I am becoming stressed, whatever I am doing, even if I'm running 20 minutes behind in clinic, I make a point to go set somewhere.

My office. Sometimes it's the bathroom. I'll just go sit in the bathroom and I put my hand on my heart and I take deep breaths. And it might only be for like a minute or two.

And I tell myself I'm safe, I'm loved and I'm fine. And I just say that to myself while I'm touching my heart. And you can feel it's amazing. Like you can feel that stress.

Just like calm itself down. It's one of the wildest things. And so I also like kind of do like meditation mantra while I'm like brushing my teeth before bed.

And it's it's been very helpful to me. What are some of the things that you think can be done to like, help mitigate stress? I think those two things that you mentioned, you know, mantras, self affirmations and, breathing and relaxation practice where you can take a quick pause.

I think those are wonderful. You know, I use a lot of, heart math, where we do the, coherence training, which is similar. Right? You imagine in breathing, you slow down breathing, you imagine breathing in through the heart, inhale and exhale through the heart.

So that's kind of like the sensation of that. Right. And then also at the same time focus on compassion. Gratitude. So really it's a it's a combination of mindset change body awareness and the heart.

And then the slowing down breathing, the combination of those three that really creates a parasympathetic response that can be measure through HRV. So I used the math device quite a bit.

And in helping people and coached them into that, you know, attaining a state quicker for themselves. So I totally agree with those two. I don't have much to add to that other than, you know, I think people talk about stress management.

I think the most effective way to, to, to go about decreasing stress is actually what I call stress transformation instead of stress management, which means that you take the incoming stress because all perception.

Anyways, so if you can perceive it differently then it's going to it's going to hit differently, right? If you perceive it differently then it doesn't feel like a stress anymore.

You know for example, for me, if something if I have some kind of challenge, I see it as a challenge. I see it as an opportunity to get better. So when it when it when I then when things get difficult, I just say bring it on.

Great. Good. Let's do it. Let's go. So to me then, I'm not eliciting a same response. I'm not saying like, oh crap, I'm saying let's go. Right, I'm getting like a little hyped up and dopaminergic and right, I'm excited about it.

So therefore it's not going to hit like a stress response, like, a downer becomes an upper. So that's kind of how I think about it, right? It's all the frame that you put it through.

This is why gratitude, right? When you being grateful then you cannot. Gratefulness and stress is kind of mutually exclusive. You can be both either one or the other.

So so that's why, you know, being in a grateful state can be helpful as well. But I think that that's all just speaking of the power of reframing. If you reframe the stress as something that's positive for you, then the physiological effect is going to be less of a stress response.

Yeah, I completely agree. It's how you talk to yourself. I've learned that too. So it's not I have to go to work and do this. It's I get to go to work and do this, you know, so that and then I agree with you.

That's why I joke with people, but not really. That's why my husband and I do hard things. So like I cold plunge in the morning and I get a hundred or it's about 100°C on it, like I do things like that.

So then I'm not kidding when I say, like, if I go to work and my staff are like, oh my gosh, we have all this stuff to do today. I'm like, I've already done the hardest things today.

I've already lifted weights for an hour. I've been in the cold plunge and I've been in a sauna, so like, bring it on, you know, like what? What else is, you know.

And so I do think that, like you said, reframing your mind, showing yourself how you can do hard things, it really helps. Like it does. So absolutely.

Yeah. And then finding something that you enjoy doing too, like what I found is like, if if setting still is not something that you're good at, which I do enjoy setting still now and doing mantras.

The other thing I enjoy doing is actually set somewhere, close your eyes, and then literally think about feeling every single part of your body like, oh, this is my pinky, oh, this is my ring finger.

Oh, this is my like, go through that in your head. Because sometimes you don't even realize like oh wow. My like right shoulder hurts because you're just so like tensed up all day.

So that's another thing you can do. But or if you can't sit and just do that, find something that excites you. Like some people like to draw, some people like to listen to music.

Some people like to, you know, go for a walk, like find something that you enjoy doing that calms you. Read a book and do that even if it's for 15 minutes.

I think that that really helps. But we just live in this world where it's always just like, go, go, go, go, go. And when you aren't go, go, go, go going, you're on your phone on social media, which is just like doing terrible things to your brain most of the time, because most of the people on social media are giving you these fantasy worlds that they live in, which are not true, and making everything look like rainbows and, you know, that's not life, that's not factual.

And so we need to be cognitive of where we're putting our attention to. And some of it needs to be on yourself like a rainbow is a fact. Yeah. Rainbow is real.

Yeah. Okay. And then the last question I was going to ask you is what role does diet, the digestive enzymes and fiber play in maintaining a healthy gut.

And balancing your hormones. And we kind of talked about that. Is there anything in particular you would say as far as fiber or digestive enzymes that help with hormone balance?

Yeah, I think we already cover everything about fiber with digestive enzyme. I think, the role there will be and I think some people underestimate the, the importance of using enzyme or even just completely breaking down.

So either through normal digestive process or if you need help from digestive enzyme in the role of inflammation.

Because if you can't break down dietary proteins completely, then these dietary protein make have more opportunity to leak through your intestinal barrier, especially if you have leaky gut.

And that can set the stage for food sensitivity reactions at this stage for more information. So that's kind of a kind of an indirect way that can go from not digesting protein to you know, leaky gut to having food reaction to inflammation to insulin resistance.

And so it's many steps. But that's how the body works. It's always chemical reactions. And physiology is always many, many steps that lead to the end result.

So this is something that I look at a lot. You know, I want to make sure that people are digesting the food. And there's also age related loss of digestive secretion, just like there's age related sarcopenia.

Stress Reduction, Exercise, and Final Takeaways

So supporting digestion, if they have compromised digestion will be very important. Even if we try to improve vagus nerve function, try to get them to meditate.

Sometimes they just need some help with digestion. It's not wrong to take an enzyme to help them to break down these dietary proteins so they don't react to them, potentially.

Yeah, I completely agree. So what I kind of got from this talk with you, Doctor Khan, is what I tell people in general. We've got to go back to the basics, which is what I why I started this podcast and it's called back to the basics. You've got to sleep.

You've got to make sure your your stress is in check. You've got to make sure you've got good nutrition. You know, and you've got to make sure all these things happen because what they do is they lower insulin.

And I've said this from, you know, I've been saying this for years and people look at me like I'm crazy. Insulin is the root of all evil and chronic disease.

It causes you to to age and to die. I mean, and so what you're trying to do all day, every day is buffer, all this inflammation and all these toxins that come in.

And that's what causes issues with PCOS, is this insulin resistance leads to inflammation. And so just going back to thinking about very much like you said, move upstream.

Go to what is the root cause of your inflammation. What is causing you know, you to be inflamed and things to not work well. And so a lot of it is I think most things is tied to our gut, unfortunately, in our culture, and whether that be directly what we're putting in our mouth or whether that be how we're putting it in our mouth, like how stressed we are or the timing, you know?

But it's really gut health is really important for everything, but definitely for PCOS and hormones. I agree, I agree, I concur. Okay, awesome. Well, thank you so much for your time before we're done.

I have my three questions that I've got to ask you. So I ask everyone the same three questions. Don't overthink them. We just like answers. People love this.

So the first question is, what is one food that's most beneficial in my. One food? Gosh, you mentioned one. I would say can I say protein or that's not a food.

So you have to pick a food doctor con. It has to be something somebody can just say, oh, doctor Khan said this was a food and it's beneficial. I'm going to eat it because it fill in the blank cake ball because it makes Halloween fun.

I'm not going to lie, I didn't know. Well, you didn't mention broccoli. Broccoli is good. You did say that it helps metabolize hormones, but fine, we'll go with cake ball.

That can be your and again I'm going to preface this by saying number one I lifted weights for 45 minutes this morning. Number two, I did my 20 minutes of cardio.

Number three I'm going to eat protein and fat before that. And number four, I'm going to walk afterwards. And I don't do that very often. So you defend your thesis.

You win. You know, I'll give you a real answer. I mean, if I were to pick one, I would say, you know, I will say salmon, you know, wild caught salmon.

The reason is because, you know, you can live without carbs. Nobody, you know, your body can go without cards. Your body cannot go without protein. Your body can also not go without essential fats.

So when we take salt, say salmon while cod assuming is a good source, then you got the protein, you got the fat, we got high omega threes. And it's really a highly digestible protein.

But beef is just fine I have no problem with I have no beef with beef. But, some people just don't do well with red meat, you know, arachidonic acid pathway.

So, you know, if I have to pick a if I were to go something I would not go without as a food would be protein. And if I have to eat only one protein and that's only the thing I get to have, then salmon might be a good choice.

I would concur. And just so you know, I had salmon for lunch with brussel sprouts and broccoli. They were both steamed. So just adding to my, you know, the reason I get to have that with your cake ball.

No, I'm having chicken and avocado. But I do agree salmon is is amazing. It's got good fat. It's good for your brain. And it's I mean you can eat it in lots of different ways.

So the next question is what is one thing that anyone listening to this podcast can do that's 100% free, that would benefit their health? Do more aerobic exercise.

You can start with walking. And if you're able to do, zone two, a little bit higher intensity aerobics, then do some running if you like to run. If you can't run or walk, then you can roll.

You can swim, you can bike. There's many ways to do this aerobic exercise, but that's for the most part is free. Right? You just need running shoes. If you're running or walking, it doesn't need any training.

You don't need a personal trainer. You just need to go out and do it. I think that if they do that, especially for people with insulin resistant PCOS, you'll get tremendous benefit.

And in fact, I will go on to say that you're not going to get over your insulin resistance or PCOS without doing some type of exercise, even if you take all the right supplements, I would completely agree you cannot exercise a bad diet.

The last question is what is one thing that you wish you would have known 15 years ago that you would have done differently so that your for your health?

So like if you could go back 15 years and say I would have done this differently the last 15 years because it would improve my health, what would it be?

I would have talked to cast doctor Cassie sooner and get a consultation with her. What would you really have done? Well, I would have done that. And, you're going to help me with my PCOS.

That's great. Yeah, I would have done that. And, I would have start doing aerobics sooner, you know, meaning I used to hate running. My whole life, I've been, you know, very athletic, played a lot of sports.

So I figure that, you know, playing basketball, playing tennis was enough. And true. When I was younger, I was playing a lot of tennis, a lot of basketball, a lot of flag football.

Just everything I can get my hands on. It was hours and hours of these things, you know, most of the week. And so I was probably getting just fine amount of exercise and cardiovascular benefit.

But as I gotten older, I have kids, you know, I don't get as much chance to play sports. I kind of just favor pushing weights because I love lifting weights.

So I kind of let the cardio side go. And the past three years, I rediscover aerobics, which I never run like for distance. And now I love running for distance.

And it's actually super enjoyable. I can see the progress I'm making, and I also know what it's going to do for me. You know, as far as protection and reducing risk from all time or cardiovascular disease, insulin resistance.

So yeah, I mean, this is something that I wish I knew to do it sooner. And I wish I would have known to keep up with it and stay consistent. So if it's anything is as you get older, it's just harder and harder to maintain muscle mass.

When you lay off for a period of time, it's harder to get back to where you were before. It just takes longer. So advice will be start exercising. And if you're already exercising, don't ever let that habit drop off.

Just even if you do less, don't stop, right? Maybe there's period. You don't feel good, do less, but don't ever quit for long periods of time because it's going to take you that much longer to get back on top.

Okay, and I will put a plug in Doctor Khan, I could I could help you with hormones. I do help men with hormones too. You don't have to have PCOS. So, I'm glad because we.

I'm really struggling with mental cramps. So we, are going to link all of Doctor Khan stuff in the show notes, but tell everyone, just quickly tell everyone how they can find you if they're interested or like, are you active on social media?

What's your favorite social? Do you have a website like how can people get in touch with you? Thank you for letting me share. Yeah, I do. I make a lot of free content online so you can find me on, YouTube is my biggest platform, also on, TikTok, Instagram, Facebook, all of them.

Just search Doctor Peter Khan. You'll see the bald headed Chinese guy. Pretty easy to find. And then, my website is asked to contact. Com. Okay. Awesome.

Thank you very much. Well, thank you for your time. We appreciate it. If you have listened to this episode and you think anyone that you know would benefit from it.

So if you know anyone and you thank me and they complain of the things that Doctor Cassidy and Doctor Khan were talking about, share this with them. That's how we get the word out.

So we would appreciate that you share it. That's why we do it to be educational. And then also please follow us like leave us a review. I would appreciate that.

And then join us next week for our next episode. Have a great day. Thank you for tuning in to Doctor Talks. We hope today's episode has enlightened and inspired you on your path to optimal health.

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