



EVERYDAY IMMUNE RESILIENCE

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Hi, everyone. Today, the topic is going to be how the vagus nerve impacts chronic gastrointestinal problems or have impacts to gastrointestinal system. If you're not familiar with the vagus nerve, it's basically part of the autonomic nervous system and it's really the nerve that's involved with helping your digestive tract release digestive enzymes and also for gastrointestinal motility. So, one of the things that we see with people that have chronic gastrointestinal issues or ongoing gastrointestinal issues is there's sometimes dysfunction in the vagus nerve. What happens with that is we have patients that and people that suffer from chronic constipation.

In the clinical setting when I see them, they typically come in, they have to be on laxatives or some kind of magnesium to softer stool to have regular bowel movements. They have to take digestive enzymes. They've been doing that for a very long time and they're trying to find this cause for their chronic gastrointestinal issues and they don't really realize that it may not have to be a pathogen or a dietary food issue, but it's actually a neurological mechanism, a so-called brain-to-gut access issue that may be the cause.

So, I'd like to share that with you. I first discussed these concepts in my book that I wrote called the *Why Isn't My Brain Working?* at a specific chapter on the brain-gut access and if you're interested in this with more than just this talk today, I have written articles at Dr. K. News and I do have an online brain program that talks about the brain-gut access with more details than I can share with you here, but I'm going to give you a lot of the fundamental information that you need to know. However, there's just a lot of other things that are important for the brain in the *Save Your Brain Program* that I have online is well if you're interested in that. But please check out my website, Dr. K. News and you'll see lots of articles related to this topic and many others.

Okay, so let's get into the vagus nerve. So, the key thing is before we get started, what I'd like to do the first 15 minutes is to really give you a basic review, maybe 15, 20 minutes of the vagus nerve and what does, how it can impact your gastrointestinal issues and if that's the mechanism, what you can do for it and once I get through that, then I'll be able to take on some questions. So, the key thing is that when you look at the nervous system, the nervous system has its own separate division, which is called the autonomic nervous system and the autonomic nervous system is involved with activating the neurons without your volitional control, so it does it automatically, uncinat autonomic nervous system.

And there is a parasympathetic and sympathetic, and the sympathetic is your fight or flight, getting your heart rate up, getting blood flow through your muscles, basically, giving your body what it needs to run away from an attack or under amounts of stress, it gets activated to give you greater blood flow and circulation and raise your blood pressure, that's all sympathetic. And then there's parasympathetic activity, which is where the vagus nerve comes in, and that's

really involved with getting your heart rate down and really impacting your digestion and really impacting just general overall organ function.

Now, when you're looking at the vagus nerve, it's really involved in what's called... it really stems from the vagal vagus nuclei and vagus nuclei or the cluster of nerves that then branch out into nerve and the vagal vagus nuclei is found in the brainstem. And I'll explain to you why this is important to you to understand, I don't want to just go over some random anatomy, but when you're looking at this vagus nuclei that's in the brainstem, it's getting input from the brain, and it's also getting input from the gut, and then it sends out input out to the gut and back to the to these nuclei through the vagus nerve, so that the cluster of these nerve, some mem cells, are right in the lower parts of the brainstem and then this vagus nuclei then has these branches to the gut and back into different organ systems and that's the vagus nerve.

Now, the vagal nuclei, the areas that really control this vagus nerve in the brainstem, there's two of them. There's the dorsal vagal motor nuclei, which is involved with contractions of the smooth muscles, and for today's discussion, I really just want to focus on how the vagus nerve impacts the gut because the vagus nerve impacts the respiratory system and it impacts the cardiovascular system, but the focus today is really just on the gut and chronic gastrointestinal disorders that may be related to vagus nerve dysfunction. So, when we look at the nuclei in the brainstem of the vagus, the dorsal vagal motor nuclei, that's involved with causing smooth muscle contractions to really get the intestines to work, to get your gallbladder to contract to really close valves between the small and large intestine in your gut. That is all involved with the motor and the term motor is used Neurology, meaning for muscle contraction and muscles in your gut and your gallbladder are called smooth muscles and the vagus nerve activates them to contract and move.

So again, because of that, this is why when the vagus nerve is not working people have issues with gallbladder function because they can't contract the gallbladder, they have issues with chronic constipation, and a lot of that may not actually be due to diet, but it may be due to the neurological input from the vagus to the gut, the so-called brain-gut access. And then another part of the vagal nuclei is an area that's called the nucleus ambiguus, not that these terms really matter, but it's another part of the vagal nuclei that really controls parasympathetic function and specifically to the gut, it does two major things that are really critical. One is it helps activate digestive enzyme release. So, it's really important for us to have healthy digestive enzymes release to have healthy gut function and to have a healthy microbiome, so it controls hydrochloric acid release in the stomach to digest protein, it controls and activates pancreatic enzyme release to digest starches, and fibers and it also releases, causes the gallbladder contract, so we can release bile to help digest most of high fats.

Now, the other second thing that this nucleus ambiguus does for the guide is that it gets blood flow to the gut and you have to have blood flow that's healthy to go to the gastrointestinal tract to allow the gastrointestinal tract to heal. So, if you don't have healthy blood flow to the gut, it's going to be impossible to really repair things like intestinal permeability with many people call leaky gut syndrome. And one of the things that and the reason I'm reviewing these things is

so you can understand the big picture of the clinical presentation of abnormal vagal function. And as a summary, let's just review them really quickly again.

So, the key thing is the motor function to the gut is impaired, so the small muscles don't contract. I'm sorry, the intrinsic muscles of the gut stop contracting and that's where you get chronic constipation and movement issues. And then the other functions of the vagus to the gastrointestinal tract, the enzyme level shut down and there's lack of blood flow. So, if you take any healthy gut and you decrease parasympathetic activity to it and you stop contraction the muscles of the small intestine and food can't cross, you're going to cause dysbiosis, you're going to change the microbiome, you're going to change the environment.

And if you take a patient that has these neurological-based dysfunctions happening from a brain-gut access dysfunction, if they get a comprehensive that use of stool analysis, they're going to show up with lots of animal things. They're going to show low digestive enzymes. They're going to show yeast overgrowths, bacteria overgrowths because you have to move food across to prevent these overgrowths, you have to have enough digestive enzyme release to help neutralize the pH of the gut and change the environment of the microbiome. And you also will see clear findings on if you do laboratory tests to look at leaky gut, you will definitely see intestinal permeability.

Now the problem is when these patients have this, it just looks like, "Oh, I just have a leaky gut," or "I may just have to change my diet to make a difference," but it doesn't make a difference for them because changing the diet isn't going to necessarily impact the brain-gut access. So for me in my clinical practice, whenever I see a patient come in and I see them on a great diet, they're eating lots of plants and plant foods, lots of fiber, they're drinking lots of water, they're even taking lots of digestive supplements and they're doing everything right for their gut. They're off inflammatory foods. They're not eating gluten, dairy, soy, eggs or the autoimmune paleo diet. They're just on a really clean healthy gut diet. They're eating lots of fermented foods, and they have chronic gastrointestinal issues? It's a red flag that the brain-gut access may not be working and they may actually have some dysfunctions in their vagus. The most important one is ongoing chronic constipation since the vagus nerve is so important for motility or the movement of food across the gut.

Now, another big clue that the vagus nerve fear isn't functioning well is that person will start to notice it's harder for them to swallow, so swallowing is also a function of the palatine muscles of the vagus and sometimes in the clinical setting, you'll hear patients say, "I really don't like to take a lot of supplements, is it possible to take powders? I have a really hard time swallowing." And if that's the case, especially if it's gotten worse over time, it's a really strong clue that the vagus may not be working. So those are all the clinical presentations when the vagus nerve isn't doing its job and patients that actually have dysfunction in their brain-gut access from this vagus nerve pathway, they go and get constantly overlooked in the healthcare system and people don't know what to do with them.

Now, in an exam setting, what we do with them to really confirm that this is happening is we check their gag reflex, their palate response and people that have their vagal nuclei not working

very well, what will happen with them is their gag reflex will sometimes just be absent, other times they'll just be really, really weak. One of the things you may have done if you've had a physical exam is when you go to your doctor you go, "Ah," and they check the little arches in the back of your throat that's called palatine muscles, those are acted by vagus. Usually when we see people that their vagus isn't working very well, there's not much movement. You really should look at these arches and see really jumps in movements. Sometimes with people who have sluggish vagal system, you don't see it move at all, you just see it kind of bunch up a little bit.

And also if you listen to their gastrointestinal motility with the scope that goes up on their abdomen, you hear very weak contractions of their bowel. They're there, but they're just really, really weak. So, when you see those in a symptom of chronic gastrointestinal issues and a chronic need for a person to take digestive enzymes and having to take magnesium and laxatives to function, that is the clinical presentation of a patient that has some vagus impairment.

And over the years, I've seen many, many cases like that, and then the question that then comes up is, "Okay, if that is the mechanism then usually for patients for the first time in their search for health, they finally are looking for something different," and a lot of these patients that have these chronic vagal issues, they have taken every digestive supplement in the world. They come in with bags full of supplements, they tried it all and they've tried every single diet. And here's the thing, those things do help them because when they don't have enzyme production, taking enzymes does make a difference for them. When they don't have proper intestinal motility, they may have to cut off sugar to function well, because they're prone to yeast overgrowths. They may have to eat a lot of fermented foods. They may have to do things to really improve the microbiome to function better, so those things do have an effect, it's just that they constantly have to do them to make a difference for them.

So then the question that comes up is like, "Well, what's the cause of it then? So if someone has a poor vagus issue, what's the actual cause?" So, if there's a vagus issue, then there's two possibilities. Either the brain is not firing to the vagal nuclei or there's something wrong with the vagal nuclei in the vagus nerve pathways into the nerve plexus in the gut, right? And there's a few things you have to look at clinically to determine what's going on.

Now, one of the worst scenarios of a vagal presentation where you have poor gut function, worst prognosis is actually patients that have early Parkinson's disease and Parkinson's disease is a disease in which there's a buildup of something called alpha synuclein aggregates and there's these proteins that start to build up in the gut and throughout the nervous system. But in Parkinson's disease, most of the research is now showing that actually, this buildup of protein starting in the gut and then it goes from the enteric plexus within the gut, all the way up the vagus nerve and into the brain, then eventually hits the dopamine centers of the brain and that's when you start to see things like tremor and that process can take 10 to 15 years, but the initial presentation of that is really these constipation vagal patterns.

As a matter of fact, the two earliest symptoms of Parkinson's disease are chronic constipation and loss of smell because the alpha synuclein also starts to build up in the area of the brain called the olfactory bulb and they lose smell. And then the third symptom that starts to show up aside from their loss of smell and chronic constipation is just they start to get stiffness and rigidity, usually in one limb versus the others and then they start to notice that their movements are just floored. And this happens many, many, many years before tremor. So, in the clinical setting, sometimes I'll see a patient walk in and I just see them, it's just they're moving really slow, everything is slow, and right away, we're concerned about a parkinsonian pattern if their chief complaint is chronic gastrointestinal issues.

Now, so that's, that's one of the most important things and then they've actually done some animal studies where they've cut the vagus nerve, they see the dysfunction in alpha synuclein buildup and they got these animal studies and then they cut the vagus nerve and they don't see it's written to the brain. So, this is very fascinating because some of this new research is really showing that Parkinson's disease neuropathology of these protein aggregate buildups are actually happening in the gut and they are really impacting the nerve plexus and then going up to the brainstem and brain through the vagus nerve. Now, there's other mechanism Parkinson's unrelated to vagus nerve, but this is one of the mechanisms that has been studied.

So, another cause of people that have these chronic vagal issues is really a traumatic brain injury they've had that has caught up with them and one of the things to understand about the brain is that the brain has different lobes, it has different regions and all the different regions of the brain as they execute their activity like the frontal lobe is involved with the executive function, the parietal lobe is involved with you feeling where your body is in relation to space, your temporal lobe is involved with, for example, hearing and recall of memory, your occipital lobe is involved with vision and seeing. All these different areas of the brain are constantly firing because of stimulation by the environment, but they all get activated and they have to fire into the brainstem, and when they fire into the brainstem, that's where our autonomic, what they call nuclei are, that the controller things like heart function, gut function, respiration and so forth.

But when there's a brain injury, sometimes we get lack of input to these areas of the brain and whether it's a traumatic brain injury or early signs of neurodegeneration, when the brain is not working well, there's lack of input to the vagus nerve and then you see all these gastrointestinal manifestations. Now, let me go back to traumatic brain injuries that the old model traumatic brain injury was you got hit in the head, something happened, and then you recovered within the next few days or a week and then everything was fine. And then that was it, and that was your brain injury, but that's really shown to be not the case.

So, lots of studies have been done on what they call post traumatic encephalopathy. There's been studies done on what they called neuroglial priming and what they have found is when someone gets in a traumatic brain injury, especially if they've lost some degree of consciousness, there is a serious injury to the brain and activate cells in the brain called microglia, and these microglia stay inflamed and activate chronic inflammation in the area of

the brain and then that promotes neuro degeneration of the brain that then goes on at an accelerated rate for the next few years.

So, it's not uncommon to see someone has these chronic gastrointestinal issues and then five years, 10 years later, they start to have chronic gut issues then when you track things back, you see history where you see symptoms of brain function that's compromised and then you see that they had a car accident or some kind of injury and that really impacted their health and especially if they lost consciousness and now, that's a common thing you'll see with people that have vagus gut issues, that they have this dysfunction in their brain-gut access. So, whether it's traumatic brain injury to the brain or early neurodegeneration of the brain, those are common mechanisms to cause this brain-gut access to be involved.

Now, if you look through the internet and the vagus has become really popular these days, and for the most part, there's lots of things about the vagus they start to see on the internet, where it's just to meditation, just to breathing, just to do cold contrast therapy, just chew gum, and those are okay, but they're not going to have much effect on the gut. And generally speaking, for the most part, calming down our sympathetic system and improving a parasympathetic system by getting a respiration and heart rate and doing breathing and just taking a break from being in a fight or flight is always good for everyone's health, no question about that, but blood actually have an impact on the gut. And I'm going to tell you, no, it's got a very little impact on actually activating the vagal motor nuclei divisions that directly fire into the gut.

I'm going to give you some things that do, but the key thing is, I don't know how to say this. Basically, there's, I don't know, online experts that have never actually worked with patients and don't understand these things and they just read one thing or another and they've compiled these different lists of how to simulate your vagus and it's not clinically real. So, of course, it's good to meditate. Of course, it's good to get a massage and relax. Of course, it's good to laugh, because if you look on the internet, they'll have all these things that really are there to come attack your parasympathetic and yes, they do activate your parasympathetic, but in a not enough aggressive enough a way to just specifically impact the vagus activation of the gut.

So, in a clinical setting, and this is what I share in my book, *Why Isn't My Brain Working* and also my brain online program, *Save Your Brain Program*, Dr. K. News, D-R-K-N-E-W-S.com. I'm going to teach you some of the things that I share in that program, and there's three really effective ways to activate the vagus directly to impact gut function. And one of them is aggressive gargling, so we'll have a patient or a person in need of activating their vagus, just get a glass of water, and then and then put in water and have a sip of water and just gargle as hard as they can, "rah," and you really want to hear that sound. It has to be very aggressive gargling, almost at the point where you have tearing, and if you have tearing, that means you're also activating your parasympathetic response, which is important. There's an area of nuclei right above the vagus called the superior salivatory nuclei that when you gurgle activates that as well and then you'll start to tear, so you'll know you're actually firing your vagus when you start to tear.

For some people that have really compromised vagal activity, they're not going to tear. They may have to gargle for a long period of time to start to then tear and then once they start to tear then that's a sign that the vagus and parasympathetic system is starting to improve. So, a lot of patient get like two or three glasses of eight ounces of water each day and just take a sip, gargle, swallow, and then go through the glass of water. It may take them, let's say, three to five minutes to go through eight ounces of water gargling, and then they do that preferably two or three times a day. And that just start to make a difference for some people within a week to 10 days to some degree. Now, it's just like anything else. It's like working our muscle. As you activate the neurons, neurons branch, they get proteins, they get plasticity and things may take time, but that's one of the ways to activate the vagus.

The other one that a lot of patients do is to do gag reflexes with the tongue blade. So, typically gag reflexes are done in the back of the throat with those palatine muscles, but that really can hurt you if you're trying to do that. So, we'll have patients, they just go to Amazon buy a box of tongue blades and just put the tongue on the back of their tongue, and then push down until they gag. And then they'll also definitely notice tearing when they do that and that will start activating the vagus and they'll just do that several times a day. They could do it while they're watching TV, they can do it as often as they like to, but getting that in multiple times a day can start to activate that vagus.

And then the most aggressive way to actually activate this is vagal pathway, this brain-gut access pathway for the vagus nerve is to do a coffee enema with bowel suppression. So, let me explain what I mean by that. So, coffee has caffeine and caffeine activates what are called nicotinic acetylcholine receptors and these are smooth muscles in the gastrointestinal tract. And we'll have patient just do a coffee enema, so they get an enema bag, they make coffee, they put it at the enema bag and then they lie on their right side. They lift the enema bag up and they do an enema.

Now, coffee will start to activate those smooth muscle pathways in the gut and the key thing to do then is to suppress it, so you really want people that are trying to improve their vagus to not just do an enema and release their bowel content because that's what enema will do and some patients that have vagal issues have to do that regularly just to evacuate their bowel, but to really hold the bowel urgency for as long as they can. And sometimes people have to increase their caffeine concentration and find the dose of caffeine it takes to really make them struggle. I joke with my patients and I say, "If you feel like you're planking, you should be shaking." And you're really trying to control those muscles in your gut, in your rectum to avoid having a spill. And when they do bowel suppression, that's activating this cortical pontine vagal pathway through the vagus to really activate those nerve plexus in gut and just like doing bicep curls to build your biceps, those can help those branches in the gut.

So these are techniques that I've developed and used with traumatic brain injury patients for many years and they seem to be effective. Now, do they always work? No, they don't always work because when you're looking at any type of injury or degeneration to the brain or something impacting the brain-gut access, when you do these activities, you're having neurons grow, you're building proteins and neurons, you're having them branch and you're trying to

improve their vagus nerve at a greater rate that things are degenerating or not working. So, if their vagal function is down, let's say the vagal function is down here and they're gargling and getting plasticity to get up here then yes, they should start to notice something and that may take a few weeks. It may not happen overnight.

For other people, they may be doing gargling exercises and doing all these things, but let's say they have a pretty aggressive parkinsonian pattern or Parkinson's pattern or a neurodegenerative pattern and the rate of neuro regeneration is just faster than what they're building, so they never really get any significant change. However, I still feel those exercises are very therapeutic and that they can be helpful in improving gut function.

So, those are the basics of vagus specifically for gut function. I really hope you can share this with people that have chronic gut issues. In my career, I've seen so many chronic gastrointestinal patients that have gut issues and this whole brain-gut access mechanism was never identified for them. And also if you identify it, it lets you know that person may be at risk to have some dysfunction in their brain or have early Parkinson's patterns, or have some early neurodegenerative issues where the brain freeze caught up, so those are all really important to know. Now, let me try to take some questions. My wife, Dr. Andrea Reyes, is here

Dr. Reyes. Okay. You just change my name all the time.

So, she's going to help me and hopefully, and by the way, thank you all for joining. And we do this regularly if you want to follow us on Facebook that would be great and we do also put these on YouTube, so we have a YouTube channel if you want to see all the... as soon as we make these videos, we put them on that on the YouTube page, so if you subscribe to our YouTube page, you should be able to get all the videos even if you've missed attending these talks. Okay.

Okay. Okay from CJ.

CJ.

Can there be over activation of the vagus nerve, too? If so, what are the symptoms and how do you address it?

Yes, there can be over activation of vagus nerve, but it's actually a really bad sign, so let me explain this in a little more detail. When neurons start to really degenerate, they get what's called epileptic form activity, which is a neurological term for that there's spontaneously firing on their own. So, neurons have something called the resting membrane potential, which is a lot of electrical activity they have and with neurons, there's a level of electrical activity that is called threshold. So, neurons are at rest, but then when they get stimulation, they fire to threshold and then you have a response.

So, what happens in neurodegenerative changes and this could take place in the brain, in the vagal nuclei in the brainstem, or in the nerve plexus in the gut. If these neurons in these areas start to really degenerate and get unstable, then the resting membrane potential gets really close to threshold and they spontaneously fire and we see things like nausea with everything

they do, so everything makes them nauseous. Looking to the left, looking to the right makes them nauseous. What they eat makes them nauseous. Any bloating makes them nauseous. Those are really signs of really progressive neurodegeneration in these pathways to the point where they're getting what we call epileptiform or spontaneous firing activity.

And what we'll also see in the clinical exam like they have an exaggerated gag reflex. Sometimes just when they open their mouth, you'll hear their palate contract, click, click, click, click, click like they're spontaneously firing. So, those do happen all the time and it just means it's much, much worse. And if that person has those really aggressive hyperactive vagal responses like that, they have to be very careful with how much gargling exercise they do, because they can really fatigue those neurons. Those neurons are really unstable, so they have to kind of go slow and if they go too aggressively, they may actually feel worse, so they have to kind of pace themselves. But thank you for asking that question. It's one thing I didn't talk about, which is really important.

Okay, so Robert.

Robert.

How do I know if my vagus nerve is the issue for my symptoms? Parkinson's runs in the family, too. So, I guess how do you differentiate?

Yeah, so if Parkinson's run your family, you do have increased risk for developing Parkinson's disease. The biggest clue that the vagus is an issue for you just looking at your symptoms is your gastrointestinal motility. Do you have constipation and do you feel like you need to take enzymes? Do you feel better when you take digestive enzymes? So, those are clues that your gut just may not be healthy. Now, if Parkinson's runs your family, you have to look for a few key early symptoms. You want to check your sense of smell and research has shown that parkinsonian disease patients lose three smells first before any other. It's peppermint, coffee and anise, so if it runs in your family, you definitely want to have a little piles of peppermint, coffee and anise and check your smell regularly and see if you're starting to lose them.

That's one of the earliest symptoms of parkinsonian disease when you lose the sense of smell, especially those three first and then if you also start to notice constipation with that, that is just difficult to figure out and then you also start to have stiffness and rigidity in one limb and slowness then you're in the early stages and you have to take a really aggressive protocol and approach to really treat your brain from all the different mechanisms whether it's neuro inflammation, blood sugar issues, brain-gut access issues, blood flow circulation issues. I try to cover all those main concepts in my brain book. You may want to check that out, but those are the key concepts there.

Okay. Lynette. **Is POTS, P-O-T-S, vagus brain related?**

Yes. So, POTS, which is Postural Orthostatic Tachycardia Syndrome where as they stand up and then they start to have their autonomic dysfunction and they feel like they pass out many times is a vagal dysfunction. And what actually is happening is you typically see POTS, it can happen

with some destruction to the autonomic nerves themselves and certain autoimmune diseases have been shown to do that, but one of the most common causes of POTS is actually degeneration of the cerebellum or of vestibulopathy where vestibular isn't working. So, the vestibular system, an area of the brain called the cerebellum, which controls your positioning and where body is in space and your balance directly fires to the vagus. That's why if ever go on a rollercoaster ride and you're moving and going at all different directions, you can throw up or feel nauseous or if you're in this windy road and you feel nauseous, those are the pathways from the vestibular and cerebellar system that's directly to the vagus nerve.

And different animals actually have like alligators if you see them, they chew meat, they have to shake their head to swallow and eat, they have to activate the vestibular system to be able to fire their vagus because the vestibular then fires into the vagus nerve, so they can start to digest their food. So, people that have degenerative changes there can start to get this POTS syndrome. And if it isn't vestibular or cerebellar issue, the biggest clue of that's happening to you is that you have a problem with balance. If you close your eyes, your balance is off. You have a hard time going downstairs. You may not know that until you actually close your eyes. A lot of patients that have vestibular issues think they're fine, but they're using the visual systems as soon as they close their eyes, they're only using their vestibular and cerebellar systems, and some proprioceptive, but mostly the vestibules and cerebellum and that's when things will really come out.

And if you had been getting carsick and seasickness and that's been getting worse, those are all clues that they you have the cerebellum mechanism as a cause of your POTS syndrome, so definitely to consider that. And if you do have POTS syndrome, you're guaranteed to have some vagal dysfunction to your gut and one of chronic gut issues may be related to this brain-gut access mechanism itself.

Okay, John. **Will vagus nerve exercises alone help with SIBO and/or Candida or do we need to take antifungals, et cetera?**

Sure. So, many people that actually have small intestinal bacterial overgrowth actually have a vagal issue because what happens in small intestine bacterial overgrowth is the bowels between the large and small intestine aren't working well, which is under vagal control and... it's just making so much noise control.

[crosstalk 00:33:18], sorry.

It's under vagal control and then bacteria from the large intestine moves into the small intestine and it overgrows, so these exercises are very helpful and useful. Now, obviously, if a person has SIBO, they're going to be prone to yeast overgrowths or bacterial overgrowths, and digestive enzymes and their entire intestinal microbiome is can be imbalanced and they're going to have to follow things like a FODMAP diet and they'd probably benefit from taking oxygen intraceuticals to help their GI function on an ongoing basis. But these vagal exercises are really important for the patients that are suffering from SIBO also.

Okay. Rachel. **Can the vagus be infected or autoimmunity occur in the gut or brain directly affecting the vagus that you also need to treat in addition to activating it with exercises you mentioned?** Okay.

That was too long. I couldn't follow. Sorry.

I'm sorry. Can the vagus be infected or autoimmunity occurring in the gut or brain directly affecting the vagus?

Okay. Can the vagus nerve be infected, meaning, can there be an inflammatory response in vagus?

That's what I think that is, yeah.

Yeah.

Sorry.

So, I think... okay, let me try that. I think that's what you're asking. Yes. So, you can actually have neuro inflammation injury impact the vagus. People sometimes get infections that get into their brain that can damage to the vagus nerve. People sometimes have neuroborreliosis where they get Lyme's disease and have an immune attack against different regions of the brain, the vagus could be impacted there. Really common issues, people that have hypertension and they start to get microvascular disease of the brain, they start to get really tiny sound strokes throughout the brain and sometimes those little strokes impact the vagus nerve directly.

So, you can actually have inflammation injure the vagus nerve, nuclei, pathways or projections from the brain into them and you can also have autoimmunity cause antibodies to demyelinate which happens to cause an autoimmune response in the lower areas of the outer brainstem, you can get some vagal dysfunction.

Okay, from Germaine. Oh my gosh. **What is it that caused the vagus to cease functioning in the first place?**

Well, what is it that causes the vagus to cease function in the first place? That was the whole list, either the brain is not working because there's an injury and trauma, either there's damage to the vagal nuclei or nerves, stroke demyelination, autoimmunity, or there's a parkinsonian pattern where there's buildup of this aggregate, protein aggregate called alpha synuclein Lewy bodies, which then start to get in the way of neuro synapsis with them. So, those are the main mechanisms.

Okay, Rita. **Does peripheral neuropathy relate to vagus nerve dysfunction?**

Yes, it can't. So, the vagus nerve is actually not a central nervous system, it's a peripheral nerve and it's peripheral coming off the brainstem and if someone has any type of peripheral neuropathy, it's very possible that the peripheral neuropathy also can include the vagus. So, anytime someone has diabetic neuropathy being the most common, there's a possibility that those injuries happening to the vagus nerve itself.

Okay. Bhaktar. **Any supplements to help the vagus nerve?**

This is not a supplement game. Okay? Now, you have to actually activate the vagus through the exercises to get it to grow. Just like if your muscle is weak, you'd have to actually strengthen it. It's the same concept. You cannot take a supplement to act the vagus. I'm sorry, you can't take it, you're not going to change this stuff in a real clinical setting with the supplement, with homeopathic, with oil. You're just not, I'm sorry. But you definitely can use nutraceuticals for the underlying mechanism that may be involved.

You can use nutraceuticals to try to decrease the expression of parkinsonian syndrome with high amounts of antioxidants, glutathione, lifestyle changes. You can do the same thing with traumatic brain injury and brain inflammation or autoimmunity or microvascular disease. So, if you find a vagal dysfunction, once it goes deeper into the cause of it, then you definitely want to support those pathways, so it doesn't get worse and if you can slow down it at getting worse and then you can do the exercise to activate it, it can make a change, but there is no direct supplementation for the vagus.

Okay. Gale. **How often in a day and how long do you recommend these exercises?**

So, these vagal exercises like gargling, gag reflexes, and coffee and bowel suppression with coffee enema with patients that they want to do this, I would say, that should only be done like, you can do that once a day. Some patients have to do it twice a day to really have motility depending on how compromised they are, but they can be done daily. And then the gargling, to be quite honest, the more frequently a person does it, the faster, the more gains they have. So, three glass of water is going through like three eight-ounce glass of water and taking a sip and gargling and swallowing and going through three times day is pretty good. If you the person needs more, that would be even better.

And same thing with the gag reflex is they can do gag, you can have a person that does a gag reflex every time they're watching TV, a commercial comes in or whatever. They schedule gag reflexes through different parts of the day and that way, they can remember to do them. So, the more frequently you do them the better, but with the coffee enemas, they can be done once or twice a day. Typically, most people do it once a day if they have to stimulate their vagus.

Okay, kind of off, but, Eloy. **Are there practices to improve the cerebellum?**

Yes, so cerebellum, like if you have cerebellar issues, any kind of balanced rehab protocol would be great for you. So, there's lots of online things on how to improve your balance. They're called vestibular rehabilitation. If you're working with a physical therapist, you want to find someone that does vestibular rehabilitation and anything you do with vestibular rehabilitation is going to immediately impact the cerebellum. Now, the basic stuff is like standing on your foot, getting a balance board, seeing how you're doing with that. If you have BOSU balls that people exercise with, which are like those half balls, standing on those, they could be useful. So, basically it's balance and stability exercises.

Okay. And Ana asks, **where do you find the exercises to correct vagus nerve function?**

In my book? You can find out your exercises? Well, I think I explained it to you. I hope that was helpful enough, but if you want a written format, then please go to my book Why Is My Brain Working. And then we'd also talk about this in more detail in the Save Your Brain course in the Dr. K. News.

Okay. Darlene. **Do singing and humming improve vagus nerve and will this improve the gut?**

Yes, the singing and humming have an impact on the vagus and they do have an impact specifically to the gut itself, but they're not going to be as aggressive as gargling or gag reflex on the tongue or coffee and with bowel suppression, but they do have similar effect for sure. It's just sometimes if you don't actually do aggressive nerve activity, you just won't notice anything, so it is useful. I do mention that in my book as a strategy, but gargling, gag reflex in the back of the tongue, not on the palate muscles and coffee with the bowel suppression are the most effective ways to activate the vagus for gut function.

Okay. John Witt. **"Datis, it's great to see you. The heart has neurons, can you comment on the heart-vagus connection?"**

No. I don't. There's the cardiovascular pathway for the vagus, which is its own thing. There's a new attack sick center with the lungs with the vagus nerve, which is its own thing. I really just wanted to focus today on the gut, please.

Okay. Germaine. **Is positional vertigo a symptom of vagus nerve issues?**

Positional vertigo is its own issue. Usually, it's caused by dislodged crystals kind of BPPV, but any type of vestibular disorder is going to have its impact on the vagus nerve because the vestibular system directly projects into the vagus nerve. There's the cerebellum and they have nuclei which fire into what are called vestibular nuclei. There's four vestibular nuclei and there's a direct pathway through an area called a brachium pontis and they activate that area directly. So, if you have vagal activation, you're going to have vagus activity. If you have vestibular dysfunction, you're going to have vagal dysfunction. They just go hand-in-hand.

Okay. Lauren. **Eating disorder patients versus TBI type of neurodegeneration, how does the chronic stress history impact vagus compared to actual injury?**

Well, I mean, the way to differentiate what the cause of vagus nerve is through detailed history. I'm not sure why chronic eating disorder itself would really throw off that vagal pathway, but traumatic brain injury absolutely will. So, whenever you see these symptoms and a sign of these imbalances, that's your issue. Now, sometimes when you see these brain-gut accesses your clinical goal for yourself or if you're a practitioner with your patient, is really to try to find the best way to make a difference there for those pathways. So, a detailed history and exam is really critical.

Okay. All right. Michael. **Can you touch on probiotics? I've heard most do not survive the gut, although spore probiotics are more recommended and apparently survive more?**

That's just all theory. I don't think spores are... I mean, listen, people that are manufacturing spores are saying it's better than every version of probiotics. There's really no studies that have been shown to show a comparison difference. It's just marketing. Probiotics themselves whether they're spore or not spore probiotics are going to have an effect on the gut for a short period of time.

So, as they transition through a gut, they'll have an effect and then they don't repopulate your gut, they don't change your gut microbe environment permanently, they just have that effect as you're taking them. And for people that have vagal issues, they may just feel better and have a need to constantly have to take probiotics because their entire microbiome environment is dysfunctional from not being able to move their food properly and to produce enzymes and get blood flow there. So we're going to have to end a little bit early today.

I have other questions right now.

Oh, don't you have to-

Yeah, but [inaudible 00:43:58].

Oh, okay. [crosstalk 00:44:00]

You're welcome. I have one more question [crosstalk 00:44:02].

My wife wrote questions down for me.

You got to go pick [crosstalk 00:44:06].

Thank you. Okay.

Okay. Lauren, really fast. **Is there a test you can take to determine vagus issues?**

There's no laboratory test you can take to determine the vagal issues from a blood test. The standard way to really determine the vagus dysfunction in the gastrointestinal world is to do what are called motility studies and motility studies, they can actually have a person ingest a dye, and measure the time that the dye goes through the gastrointestinal tract and that can give them a clue how active the neurological function of the gut is. So, the test to really determine if there's any vagal dysfunction objectively would be to do a motility study which should be done with a gastroenterologist and you'd have to have significant progression to have a change there.

Okay, so I think I can see them up here. Let me go through some questions here. **I've heard that singing and humming help with vagus nerve, does that help with the gut as well?** So yeah, singing and humming. I think we've talked about that. **Do you get low blood sugars in just peripheral neuropathy? Yeah, so the question is, do you get low blood sugar symptoms with these vagal symptoms?** It can happen as well, so if the vagal system is dysfunctioning, it throws up your autonomic and you can get like these patterns where you get imbalances between your sympathetic and parasympathetic patterns and that can shift off your blood sugar regulation and control.

And then I got a question here from Jenna V. **In your book, you say using tongue plate depressors, like doing pushups, like singing is like doing a sprint. What does the coffee enema and breathing exercise in terms of strength to the nerve?** So, that is something I talked about in my book. So, coffee enemas are like doing planking or doing a squat against the wall, like a sitting squat test against the wall and you're shaking and really activating the system. It really builds core activation to the vagus.

And Diddy asks, **could butyrate on a stool test be symptom of vagal nerve dysfunction?** It's possible. Everything is possible to be abnormal in a gut GI panel when there's vagal dysfunction. So, butyrate is the ability to digest fibers and to produce this short-chain fatty acid, so when there's decreased motility and decreased digestive enzymes, you can get abnormal levels of butyrate production because the gut is not doing its job. And the key thing to remember is if you have a vagal dysfunction, if you get a GI panel back, all of those changes can be whether it's a bacterial overgrowth, or yeast overgrowth or low butyrate levels, they can all be related to poor vagal pathway.

And then Sukra asks **diarrhea also related to vagus nerve function?** So, earlier we talked about neurons being close to threshold where they fire aggressively, so if the vagus nerve is really unstable, then that would be part of it.

Okay. And then a question from Lauren, **IBD flares, how do you advise patients to calm down elemental diet gaps [inaudible 00:47:34] butyrate?** Oh, I think the question from her is how do it really come down to IBD flare ups? That's a really complicated question, really unrelated topic, so let me skip that one.

Okay. The next question someone asks, Kim, **does vagal function also affect sleep? I have chronic constipation and no gallbladder. Sleep is my other issue.** Absolutely. If your vagal function is not working really well and you're in a sympathetic mode all the time, then you can definitely have issues with sleep.

And then Annika asks, **are pro kinetics required if you have SIBO and difficulty clearing it?** Yeah, so people really have these brain-gut access issues and get diagnosed with SIBO. There's a list of medications that gastroenterologist use that are called prokinetic drug and prokinetic means to really promote movement, which is kinetic of the bowel. So, there's lots of drugs that specifically activate the neurotransmitters in the gut to cause motility and movement. For some people that have significant vagal dysfunction that can be also helpful and useful for them to make a difference as well.

Okay. **Any supplements help the vagus?** I think, just making sure I got everything. All right. Okay. So question, **can essential oils be used, from Gita, along with exercise to support the vagus nerve?** Yeah. Again, you can use essential oils for lots of things, that's great. You're not going to build plasticity in the nerve with any supplement or oil. You actually have to activate it. And this is a frustration I can see in some of the patients. I see patients come in and they go, "Okay, what's my nutritional protocol?" They're happy to just take pills, but they're actually not able to do the work to build muscle contractions and regenerate their vagus and activate.

So when you do these exercises, you build mitochondria in the neurons, or I should say any exercises that activate the nervous system, put mitochondria to the neurons and they help neurons branch, you're going to need to activate those to do that. It'd be just like saying, "Hey, can you take an essential oil to build muscle mass?" Do you guys know that because we can easily measure that. So can you take an oil to see your biceps grow or your legs get stronger? And the answer is no. The same exact thing with the vagal nerve.

Okay. **Can psychological trauma cause vagus problems?** Yes. So, there's also research that does show that when people get PTSD or they get what's called the limbic loop really activated, where they get such a severe stress response that their pathways in the brain that involve the limbic system get so activated and continue to fire, they get in a chronic fight or flight response and the chronic fight or flight response is going to have a suppressive impact on the parasympathetic system including the vagus and a big coup that's happening is dry eyes, dry mouth, poor swallowing, poor gut motility. You want to see those other symptoms to really know that the parasympathetic system is being compromised from chronic psychological trauma.

The problem with psychological trauma is you can blame everything in the world on it, but the other issues it can cause, a lot of diverse symptom dysfunctions when it's there. So, psychological trauma by itself wouldn't just assume you have a vagal dysfunction. You have psychological trauma in combination with signs of poor vagal function, which include, again, dry eyes, dry mouth, difficulty swallowing chronic constipation, then I would guess that that may be the mechanism that's involved.

Okay. I think we got most of these here. Okay. Do emotional trauma... where are you? Let's go down here. Okay. All right. A question from Brooke. **Can mold paralyze the vagus nerve and if so, will these exercises still help with living mold?** So, the mold is not going to specific directly impact the vagus nerve, but if someone has chronic mold exposures and they have microtoxins exposure from the mold and it activates and revs up their immune system, and if the immune system then starts to develop neurological autoimmunity, which can happen with any kind of chronic infection, and even with chronic mold toxicity exposure, and if they progress into a neuro inflammatory autoimmune response, then you can have some impacts on the vagus nerve. But just mold toxicity itself, mold exposure itself, and the toxic mold syndrome itself doesn't necessarily shut down the vagus nerve. There has to be something that directly impacts the vagus nuclei itself.

Okay. I think, I got most of the questions. Let's see here. Okay. Anyways, let me just summarize the key things here. So, the whole point of this presentation was to really share with everyone, there is a large group of patients with chronic gastrointestinal problems that actually have a brain-gut access mechanism and this brain-gut mechanism involves vagal dysfunction. When the vagus is not working, there's lack of blood flow to the gut, there's decreased digestive enzymes, there's decreased motility of the gut and there's bowel dysfunction. Many patients that have this get undiagnosed in the healthcare system and/or they're progressing to what's called small intestinal bacterial overgrowth, where they just can't get motility, they can't control their bowels and bacteria overflows.

And if you are listening to this and you do have these brain-gut access mechanisms of vagus, like difficulty swallowing symptoms has gotten worse over time, poor motility, poor constipation and you have to constantly take digestive enzymes, you have to take stool softener then it's very likely that you, it's possible, I should say. It's possible that you have this vagal dysfunction. So once you identify that you have a vagal dysfunction, the next question is why. So, you can only have a vagal dysfunction if something impacts pathways into the vagus or the actual vagus nerve or the nuclei are injured or damaged.

So, one of the most common mechanism is Parkinson's disease, early Parkinson's disease, any kind of traumatic brain injury, any kind of neurodegenerative issue, anything that causes inflammation injury to the myelin like demyelination, like autoimmunity to the nervous system, diabetic neuropathies can actually impact the vagus nerve. Those are key factors, any kind of ongoing neurodegenerative issue. Those are all key things to evaluate. Microvascular disease that causes mini strokes in the brainstem or the brain can also lead to vagal dysfunction. Cerebellum degeneration, vestibular disorders, it would be like motion or balance disorders can cause these vagal dysfunctions.

And the ultimate thing is that when you see these vagal symptoms, it's not actually just through the exercises, those are just the ways to help plasticity, but the more important question to ask why and then you want to go into these mechanisms.

Anyways, thank you all for joining me today and I hope you found this information useful and please follow us on our Facebook page. We have a YouTube channel and check out Dr. K. News. And we'll hopefully see you next time. Thank you.

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