



# Mind ↔ Body

## & the Vagus Nerve Connection



### **Symptoms and Root Causes of Vagus Nerve Dysfunction**

Guest: Dr. Navaz Habib

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**Dr. Eva Detko:** Hello and welcome, thank you for joining me for the Mind Body & the Vagus Nerve Connection Summit. I'm your host, Dr. Eva Detko, and my guest for this session is Dr. Navaz Habib.

Dr. Navaz is the founder of Health Upgraded, a functional medicine and help optimization clinic in Toronto, Canada, working with high performing professionals, athletes, and entrepreneurs in identifying the root causes of health imbalances, and addressing them naturally. These patients experience optimal health the way their bodies were meant to feel. Dr. Navaz is the author of Activate Your Vagus Nerve, which is a simple to follow guide to help you optimize your productivity, focus, and energy levels, and to allow you to experience the effects of upgraded health. So Dr. Navaz, welcome to the summit!

**Dr. Navaz Habib:** Thank you so much for having me. I'm excited to be here.

**Dr. Eva Detko:** I am excited as well because I personally think that you're an ideal person to open this summit, because you've got a brilliant book on the vagus nerve, Activate Your Vagus Nerve, as I said in the intro. And I think it's one of the best books out there on the vagus nerve. So I'm very excited that you're here and you're going to talk the viewers through the different aspects so we can have a bit of an overview before we go deeper into all of those aspects of the vagus nerve with speakers in those separate sessions.

But what we're going to do here today is to give people this sort of bird's eye view of what this is all about and why we're doing this summit. So let's start by introducing the vagus nerve, telling people what it is, and maybe anatomically where it is located as well.

**Dr. Navaz Habib:** Of course, and thanks for starting off with this. I really do think it's an important place to begin, so I'll just jump right in. The vagus nerve is that nerve that we don't realize has so much of an effect on our body, positive and negative. When it's working, obviously, very positive. And when it's not, it can have very negative consequences. The reason for that is the vagus nerve is connected to, and a lot of people don't believe this until they actually see it, but it's connected to essentially every single organ in our thorax, which is our chest area, and every organ in our abdomen, every digestive organ, every detoxification organ.

It's essentially the highway, the information superhighway, getting information to and from those organs and the brain. And so when we look at its physical location, where is it located? Well, the vagus nerve spelled VAGUS actually begins in the cranium. It's one of the twelve pairs of cranial nerves. So we have 12 nerves that begin in the brain stem, essentially right below the brain, just at that top area of the spinal cord almost. And those nerves generally will stay within the face and the neck area, and they'll stay within the cranium. And the tenth nerve of those numbered pairs is the vagus nerve. And this is the only nerve that actually leaves the cranial cavity and goes into other places.

It has so many different effects. It's called vagus, because the word vagus comes from the word wandering. So essentially, it goes to so many different places. This was something that anatomist, when they were studying this couldn't believe, that there was a single nerve that came from either side, there's one on the left and one on the right, that came down through the carotid sheath, which was very important, we'll talk about that in a moment, and it goes down to all of these different organs and it sends information to and from.

Now when it comes down, out from the brain stem, it goes down through the neck, and specifically is attached to, or right beside, the carotid artery and the jugular vein. We have a carotid artery and jugular vein on either side of our neck. And those are the blood vessels that take blood directly from the heart to the brain, and back from the brain to the heart. Those are the most important blood vessels in regards to brain function and the ability for our nervous system to do its job. And inside that sheath are those two blood vessels, as well as the vagus nerve. So it really goes to show just how important the vagus nerve truly is in creating health and actually having optimal function in that nerve.

And actually, prior to going into the neck, it's going to send a branch to a part of the ear. It's going to send branches to the back of the throat, to the vocal cords, the muscles around the vocal cords. It's going to send branches as it comes down into the thorax, to the heart, and to the lungs. And it's going to continue on down beside all of these organs, down beside the esophagus and then pass into the gut, into the abdomen, and it's going to attach to the stomach, the small intestine, the large intestine, the pancreas, the liver, gallbladder, kidneys, spleen. And that's just how important the vagus nerve truly is. And that's just a basic overview of its anatomy.

**Dr. Eva Detko:** Excellent. And I think it was important to share that because we want people to have a very clear picture of what we're dealing with here. And that was very well explained. So thank you for that. So let's talk about the functions now, because they're so wide-ranging that it is almost hard to believe that one nerve could have these many functions, or one "anything" in the body can have this many functions.

**Dr. Navaz Habib:** Certainly, and the functions are wide-ranging, and essentially as diverse as the organs that it attaches to. Each one of the organs that it attaches to is going to have a different function. But let's talk about specifically what the vagus nerve in terms of information sends to each one of these areas. So about 80 percent of the information on the vagus nerve is actually coming from all of the organs, from the gut, from the liver, from the heart, from the lungs, and going up to the brain, telling the brain what's going on. These are called afferent, AFFERENT, signals. Signals coming from the body telling the brain, as status signals, telling it what's going on in each organ.

This is all also a really important thing to remember because that is the gut-brain connection, the physical connection of the gut and the microbiome to the brain. So very, very important function in that 80 percent of what's going up. We also have about 15 percent of the information going from the brain to each one of those organs specifically. So it's going to the heart, telling the heart to slow down, bringing down the heart rate, get to a point where it's not beating too fast. It allows us to come down using what's called the parasympathetic nervous system, which is a branch of our autonomic nervous system.

Now, dig a little bit deeper there. The autonomic nervous system is essentially the nerves and the connection between the brain and those organs that we don't consciously have to think about doing. So I'm not consciously thinking about beating my heart. I'm not consciously thinking about breathing at this moment, or detoxifying, or digesting my food. I'm not consciously thinking about those things, but they're happening anyway.

And so our body has this automatic system called the autonomic nervous system that allows these things to occur. That autonomic nervous system is broken down into the sympathetic nervous system, which is the fight-or-flight response. This is our survival mechanism. It's necessary to have. It makes sure that we are alive and making sure that we are surviving. But it's not the thriving side. The parasympathetic is the opposite of the sympathetic, and that is the rest-and-digest system. And that is mediated through the vagus nerve.

And so we get signals in that 15 percent of information that's going from the brain to each of these organs as parasympathetic innervation, or parasympathetic information, helping to decrease our heart rate, helping to decrease our breath rate, helping to increase blood flow and digestion in our stomach, our small intestine, our large intestine, our pancreas, our liver, our gallbladder. And our spleen to help filter our blood, and our kidneys to help filter out the water and the blood as well. So essentially what it's trying to do is, allow us to thrive and recover from the stressors that come up when we are under stress.

And so the functions of the vagus nerve are 80 percent coming up from the gut and all of the other organs as status information, 15 percent coming from the brain, telling the organs that we are in a rest-and-digest state, that we want to function and we want to be optimal. And then there's two other little functions, and these are the ones that are important when we want to actually activate the vagus nerve. And so the first one is about 3 to 4 percent of the information is being sent from the brain to the muscles of the back of the throat and to the muscles around the vocal cords.

Those are really important because those information signals are actually stimulating my vocal cords right now. The reason I have any pitch or tone in my voice is because the vagus nerve is working. So one of the most common signs I'll see when a patient comes in, or I'm talking to them online, is that they'll have a very monotonous voice, and not be able to really raise their pitch or tone.

That is a sign that their vagus nerve is not working optimally and that they're actually having trouble getting to that parasympathetic state, that their body is remaining in a very stressed state. And that last little bit, that last little 1 percent of information, is actually from the skin of the ear, just on the inside area of the ear. That's sending information to the brain. And this is really cool because we can use that information, we can use that innervation to help stimulate the vagus nerve using specific tools, which we can talk about later.

**Dr. Eva Detko:** Fantastic. I love it. That's a very good, clear explanation. Fantastic. I think that people are starting to get a really good idea on the importance of maintaining healthy vagus function. And what I wanted to also do is to give a little bit more of a background in terms of how the vagus nerve actually works. In fact, how nerves work, period. So what needs to happen for a neuron to have an effect on cells? That would be useful. Obviously not too much detail with that, but I think it's important to understand how it actually works.

**Dr. Navaz Habib:** Of course, that's a great place to start for those who don't have a lot of understanding of nerves and the nervous system. The way that our body send signals is from an electrical charge that comes up in a specific area of our brain. And that specific area of our brain lights up and there's electrical and biochemical activity occurring. And what happens is that electrical and biochemical activity stimulates from one cell to another, one neuron to the next through a space called the synapse.

And so an electrical charge actually passes from one neuron along its long axon, which is the really long fibers that allow it to be a single nerve that sends signals from long distances. And that electrical charge passes across the neuron. And then it comes to a space called the synapse, where it's going to send that signal using neurotransmitters from one cell to the next. And in the case of the vagus nerve, the neurotransmitter that is used is called acetylcholine, ACh.

And so what happens is as that electrical charge gets from one nerve to that synapse, it's going to stimulate release of that acetylcholine into a small little gap, where these neurons are then stimulated on the post synaptic membrane. The synapse essentially sends this information to the other cell, onto receptors. And that's how we start a new electrical charge on the next neuron, which is going to send information to the next cell.

That doesn't just happen from nerve to nerve cell, from neuron to neuron. That actually happens from neuron to any cell that it's going to innervate. So in the case of, for example, my nerve to muscles. For me to go and pick up my pen, I'm going to send a signal from my brain. I'm going to make a decision that I want to pick up my pen. And that signal is going to be sent to my motor cortex, and my motor cortex in the part of the brain is going to send a signal down through the axon to the muscle, and all of the muscles that are necessary, for me to extend my hand to pick up the pen, and to pinch it. And that's how we send a signal from the brain to the muscle.

In the case of the vagus nerve, those signals are simply being sent from the brain to the organs, or from the organs to the brain. Or in the case of muscles to the neck and from the skin to the brain as well. It requires electrical activity. It requires a charge that moves relatively quickly from one side of the nerve to the other, or from one side of the neuron to the next. And it requires the release of neurotransmitters, or biochemicals, that help to signal on the next cell what's going on.

**Dr. Eva Detko:** Yes. Excellent. Wonderful. So, yes, of course, our bodies are electric and therefore a lot of the strategies and approaches that we take to health should also be along those lines. It's not just about biochemistry all the time, isn't it? So you mentioned one of the symptoms and that is a monotonous voice. So when somebody can't project, they're trying to get their voice out, it doesn't quite happen, so we know that's one of the symptoms of vagus nerve dysfunction. But perhaps you could follow up from this and talk about other symptoms of vagus dysfunction?

**Dr. Navaz Habib:** Certainly. So when we look at essentially what would be a sign that the vagus nerve is not working correctly, what doctors are going to pick up on when they're assessing you. What I look for when I'm talking to a patient is, I'm looking for the organs that are innervated by the vagus nerve, not functioning optimally. So I'm looking for the function of the gut. I'm looking at heart rate being very high. Essentially, numbers over 70 - 80 beats per minute are signs that we're not getting enough of that activity, or that nerve information, through the vagus nerve to calm the heart down. When our breath is very shallow and generally focused on chest breathing rather than belly breathing. And we'll talk about breathing down the road.

When I see that people's gut function is a little bit slower. They're having trouble digesting food, when their stomach doesn't work. There are certain specific conditions that will have these issues occur. And what we're not able to do when the stomach is not able to get that innervation from the vagus nerve, is it's not going to produce stomach acid. And so food often just sits in the stomach. And this is a really important thing to look at. So we're not getting movement of food along the digestive tract.

The next one is peristalsis. That we have slow motion of food through the small intestine and the large intestine. Or it can be the exact opposite and be really, really fast. So one of the things that I look for is bowel transit time. I'm looking to make sure that food is moving along the gut from the mouth to the anus at an optimal amount of time. And that optimal amount of time should be between

12 and 24 hours. 16 is kind of that perfect number. If we can be at that 16 hours from when we eat to when it comes out, is what we're looking for.

The way to test this, a really simple test that I have my clients do is called the Bowel Transit Time Test, where we're going to use sesame seeds. And I highly recommend using white sesame seeds that you can get from any bulk store, organic where possible. You do your best to take a teaspoon, or a tablespoon, of it and put it into water and you're going to drink that water without chewing the seeds. Just let the seeds go. We don't have the enzymes and the ability to break down these seeds. And so they simply pass through.

So we're going to take a sip of that water with the seeds in it. And we're going to mark down the time that the seeds were ingested, that we took them in. And then what we're going to do is, we're going to look for it to show up in our stools, in the bowl. The best way to do that is to just keep an eye out. And when they're white sesame seeds, they're generally far more easy to see than, say, for example, black sesame seeds. This can also be done with corn, but I tend to stick to the sesame seeds because they're easier to take in.

And so what we're looking for is, when we first start to see those sesame seeds come out and when we last see any sesame seeds come up, when there's no more. And we're going to mark down those times. And the time between when we ingest to when we get rid of them should be around 16 to 20 hours at an optimal number. If it's anything more than 24 for anything less than 12, that's a sign that things are not working as well as they should be in the gut. So that's a really simple way to see from a functional perspective, from a functional medicine based perspective, that something is not working correctly. And those symptoms are signs that we're under more stress than we should be, and our gut is not working the way that it should be.

**Dr. Eva Detko:** So you're touching on some of the things that can indeed go wrong there. And excellent tips, particularly with the test. That's definitely worth doing. We need to know where we're at. Because too often people have actually, in fact, all sorts of digestive symptoms that they think that, this is normal. But a lot of this stuff that people experience, such as bloating, burping, things like that, they're not normal. They are a sign that something is not quite right. So fantastic tip with that one. So you started touching on the dysfunctionality, talking about the symptoms. So let's expand on this now and talk a little bit more about the different things that can go wrong with the vagus nerve. All the things, such as dysfunctional breathing and dysfunctional digestive sequence, and so on.

**Dr. Navaz Habib:** So we'll start with the most common one that I see, is dysfunctional breathing. Oftentimes people have trouble breathing correctly and I did allude to it earlier, that oftentimes people are breathing using their chest. And oftentimes people have very tight muscles, their traps, their upper back muscles are very, very tight. And that's because they're using those muscles to breathe. So a really simple test that you can do and you can literally do it at this moment, is to put one hand on your chest and put your second hand right on your belly. And what you're going to do is, you're going to sit, eyes closed for a moment, and you're going to just take three deep breaths. And what you're going to do is focus on paying attention to which hand is moving. Is that your upper hand on your chest? Or is it the lower hand on your belly? So do that for three seconds and just kind of let those breaths come in and out.

And most commonly, people are having trouble breathing because they're breathing through their chest. Most of the movement, 70 percent of people that I've found, have more chest breathing than belly breathing. Now, if you're breathing with your belly, that's a very good sign that you're in a relaxed state and that your vagus nerve is probably working well, and that you're breathing correctly. But the vast majority of people are not breathing using their diaphragm, and the vast majority of people are breathing using their accessory breathing muscles more than their diaphragm. And that can be a sign. Because what happens with our body is there are certain inputs that tell us that we're under stress.

Now, for example, let's say you're sitting down at your dinner table and a tiger was to walk into the room, or a lion was to walk into the room. Immediately your body's going to say: "Oh, my goodness, what is happening?" And you're going to go into a state of fight-and-flight. And what that means is we're going into a sympathetic state. A state of being able to survive the threat that has showed up in our lives. So what's going to happen, our pupils are going to dilate, we need to be able to see everything around us. We need to be able to make sure that we can get away from the threat. What are all of our exits? These are survival mechanisms. At the same time, our heart rate is going to just skyrocket. Get up to 100, 120, 150 beats per minute for a lot of people. That's a sign that we're out of the parasympathetic and completely shifted to the fight-and-flight mode.

What else is going to happen is our breath is going to become very rapid and very shallow, and that is when we breathe through our chest. We're going to start to almost hyperventilate. And that is a sign that we're under stress. At the same time, we're going to shut down all of the nerve information and blood flow to all of our digestive organs, because at that moment when the tiger is trying



to come at us, we don't need to worry about digestion, and liver detoxification, and blood flow to those areas. What we need is blood flow to our muscles so we can fight, and muscles to our legs so we can run away, fight and flight. It's our survival mechanism.

So when we breathe shallow, when we breathe through our chests, we're actually sending a signal to our brain that we are under stress, and we're actually shifting ourselves from that rest-and-digest state into a sympathetic state of fight-or-flight. And we're essentially giving ourselves an artificial tiger walking into the room. This happens any time, let's say, for example, if your boss is to call you into their office, or your kids are screaming around you. Things like that are going to drive you to feel like you're under stress. And so it's very important to become very aware if you are artificially acting and putting yourself into a dysfunctional breathing state, because that's going to push you into that sympathetic fight-or-flight mode. So mindfulness of that is very important. So that's where dysfunctional breathing oftentimes plays a big part of this.

Now, for a lot of people, it's not conscious. We're not doing this consciously. And no time more so than at night. A lot of us have sleep apnea and don't even realize it. Sleep apnea occurs when our airway actually gets plugged up while we're sleeping, and we actually stop breathing for a period of time. That's a sign that what's happening is, there is a collapse occurring inside the muscles of the back of the throat. Either the tongue is falling backwards or the muscles are collapsing, and they're just not strong enough to handle the airway and keep the airway patent.

That's important because hypoxic events, events where we have low levels of oxygen coming into our body, are major stressors on our brain. Major stressors on all of our organs. And that dysfunctional breathing is a sign that our vagus nerve is not working well at all. So sleep apnea, or apnea at any time when we have breathing that is actually limited by physical blockages, is a sign that the vagus nerve is not working correctly. So a really important one to look at there.

**Dr. Eva Detko:** Absolutely it is. And you know, the issue is also that people can get on this vicious loop because the breathing may have been dysfunctional for them for a very long time. So maybe there was some early childhood trauma, early life stress, and things like that. And we know that early childhood trauma makes you less equipped to handle stress. So even because of those sort of things, never mind postural issues, and stuff like that, but even that could mean that somebody may have had dysfunctional breathing all their lives.

So what then tends to happen is that they put themselves in the sympathetic state just because the breathing pattern is dysfunctional. So all the everyday stresses aside, they could be just feeling on edge all the time, just because they have that pattern of breathing. And then you go on that loop, because as you said, more feedback and then you feel more stressed, and then that again affects the breathing, affects the physiology, and so on and so on. So it's really, really fundamental to correct it if we're going to get anywhere in terms of improving vagus function, or just improving health overall.

**Dr. Navaz Habib:** Certainly, and dysfunctional breathing is one of the most common things that I'll see, whether it comes from childhood trauma, like you said, or simply just being conscious of what other people are doing around us. Oftentimes our parents don't realize, but when we're children, what we're doing is we're watching the way that they do things. And if you ever watch a baby breathe, I have a two and a half year old daughter, who is absolutely my favorite person in the world to watch because her motions and her breathing pattern is so pure.

It is just the way that we're supposed to be built. So when she was a baby, I used to just watch her breathe, and you would see her diaphragm and her belly raising. It was just the coolest thing. But over time, what tends to happen with kids is they start to actually have these conscious things saying: "Oh, my goodness, belly. My belly is a problem. I can't have a big belly." And we have sometimes these dysfunctional thought patterns that lead us to say: "No, I have to hold my belly really, really tight. I have to keep it in." And so we start to have to breathe using our chest. And so that dysfunctional breathing is actually the basis on which Pilates and yoga have been built to help people learn how to breathe properly again.

**Dr. Eva Detko:** Yeah, my PE teacher and my gymnastics teacher were the worst culprits for me in that respect because you always had to hold it in. It's true, it's true.

**Dr. Navaz Habib:** Definitely.

**Dr. Eva Detko:** So Okay, that's breathing and we just can't stress it enough that if you guys are watching and you're identifying that your breathing is a little bit dodgy, and that that pattern isn't right, to actually spend some time correcting that. It doesn't have to take an awfully long time when you actually focus on it. But once you reprogram your breathing pattern, then you're good to go because you will be breathing properly. And you mentioned breathing at night, we know some people get really good results with mouth taping.

**Dr. Navaz Habib:** It's funny you say that, I actually mouth tape every night, and I actually also make sure that I use some sort of Breathe Right strip, or something to help keep my nose open, because we should be breathing through our nose. Our nose is built as our breathing tube. Our mouth is our feeding tube. We have a back-up. The mouth is a back-up breathing tube. But we should not be consciously primarily breathing through our mouth. We should be breathing through our nose. And mouth taping is a great way to help train people to breathe correctly through their nose.

And when we breathe through our nose, it's actually a sign to our brain that we are calm. Because when we're under stress and we're running away from a threat like a tiger, we're tending to breathe through our mouth. When we're exercising at our absolute max, when I'm riding my bike, I'm breathing through my mouth. That's a sign that I'm under stress. Sometimes it's good stress, sometimes it's bad stress. But under stress, we breathe through our mouth. So if you're breathing through our mouth, we're telling our brain that we're under stress.

**Dr. Eva Detko:** Yeah, and this is the reason why I get feedback from clients who had difficulty sleeping that when they actually do this, their sleep will become more functional and they're actually able to sleep better. That's obviously the reason why, because they're now sending the right messages to their brain. Whereas before, they may have been lying in bed and not just even breathing through their mouth, but also have an overactive mind, the monkey mind, over thinking, and so on. And when they sent the right feedback through correcting their breathing with the mouth typing, everything comes down, the mind calms down as well, and then consequently sleep improves. So it's really quite a good tool.

**Dr. Navaz Habib:** Yeah, absolutely. That's a great place to look at. That when people are noticing those changes, when they're breathing through their nose, and they're more calm, and they're relaxed, and the vagus nerve actually can do its job, the parasympathetic system turns on, and our body is able to recover. Which is why people are able to sleep much more soundly, and those that sleep more soundly recover better and are able to take on more stressors the next day. So sleep is actually a really great place to see if recovery is working well.

**Dr. Eva Detko:** Yeah, absolutely. It's that positive feedback, isn't it? So talking about dysfunctional sleep, do you want to elaborate a little bit what the connection is, and why that is such a big issue for the vagus nerve?

**Dr. Navaz Habib:** Yeah, absolutely. The sleep is absolutely imperative and we know this. We don't necessarily all have the exact same amount of sleep that we need, but we all need to be able to recover. And sleep is recovery. Sleep is when our body is able to handle and recover from the stressors that we've had from the previous day. And if we're not getting good sleep, then the recovery doesn't occur, and the next day we're just going to fall further behind and have more stress added on. And our body is not able to handle that.

So our organs start to get really tired when that occurs. So for sleep, a couple of the things that I recommend to people is mouth taping is a great one, and I'm glad you mentioned that earlier. I also recommend certain sleep hygiene habits to help improve your ability to calm down and get into a calm state. So deep breathing exercises right before bed where we're really using our diaphragm, it's a wonderful way to just get ourselves calm, get relaxed, get into a state of recovery so that we can then fall asleep. We all now are starting to realize the effect of blue light on our ability to recover. And blue light is a good thing in the daytime. But in the night-time it's a sign to not produce melatonin, which is necessary for us to get restful sleep and to recover.

So blue light is good during the day for a period of time when the sun is at its highest between probably 10:00 a.m. and about 3:00 p.m. But after that, that blue light and that ultraviolet light goes away, and the light becomes much redder and warmer. And that red warm light is a sign to our body that we need to unwind, that we need to de-stress. That we need to get to a point where the serotonin that we've produced during the day shifts to melatonin at night, and that allows us to get better sleep. So I know I've shifted a little bit into the hormones and the biochemistry a little bit, but melatonin production at night is necessary for vagus nerve function, and for recovery to occur during sleep. And sleeping in an absolutely dark and cool room is necessary to get optimal sleep and optimal recovery.

**Dr. Eva Detko:** Yeah. The temperature certainly has such a massive impact, and obviously light and as well as not eating too late, not exercising too until late. Those are other factors as well. So could we now talk a little bit more about the connection with the vagus nerve and digestion? There's a major, major connection there. And not necessarily just microbiome, but also the impact on the liver, pancreas and so on.

**Dr. Navaz Habib:** Certainly. So that's the next big step when we're looking for things that can go wrong in the vagus nerve, but in any organ overall. We have to start with the gut. So when I look at the gut, what I'm looking at is function, peristalsis. Are the foods being pushed across the tubes in the right pattern at

the right rate? And making sure that that is working. In the stomach, like I said earlier, we want to make sure that there is stomach acid being produced. So there's ways to assess these things. But if it's not functioning well, then we're not going to produce enough stomach acid, and intrinsic factor in the stomach. We're not going to have optimal peristalsis and movement of the bolus of food as it goes through the intestines. And we're not going to be able to get great information from the intestines up to the brain.

So we don't really get a great status update of what's going on with our microbiome, and the balance of what's happening with those bacteria, parasites, viruses, and yeast, that are living in the intestine, doesn't get up to the brain. So really important to look at gut function. Now, why that's so important is because about 70 percent of our immune system, the cells of our immune system by volume are located in the lining of the gut. And so our immune system is like our second line of defence. It's our major defender against things like toxins, bacterial toxins, food-based issues that are coming in that we react negatively towards. The inflammation is going to make sure that those things don't occur. The immune system does that, and it does so using inflammation.

Now, low levels of inflammation are good things, and necessary against toxins entering the body. But inflammation, when it's chronic, when it's uncontrolled, becomes problematic. And what is controlling that inflammation level, funny enough, is the vagus nerve. So that 15 percent of parasympathetic activation that comes from the brain and goes down to all of these organs has a very strong piece of it that is specifically involved in putting the brakes on the inflammatory system. It's called the cholinergic anti-inflammatory system specifically, and it uses acetylcholine, the neurotransmitter that is used primarily in the vagus nerve.

So what happens essentially is, we get a status update that something is breaking down, too much toxin is picking up in the gut, and we have maybe a leaky gut, for example, and some toxin is making its way into the body. And so our body starts to produce an inflammatory response. Our immune system turns on. We send a signal to our brain saying: "Hey, this is going on. Tell us what to do?" And the brain processes that and through the vagus nerve, sends a signal to the gut to decrease inflammatory markers through using acetylcholine. So it's going to send the signal down to the gut, to the spleen to decrease macrophage activity, to decrease inflammatory cell activity. Essentially just put the brakes on it because we don't want it to be too strong.

Now, where that becomes a problem is if we have chronic inflammatory diets. If we have chronic small intestinal bacterial overgrowth, if we have completely imbalanced dysbiotic gut bacteria, when there's parasites that should not be present that are present and stealing nutrients away from us, when there is worms, or viruses or yeast, that are present that are causing breakdown of that gut lining. An over-activation of that immune system, that the vagus nerve can no longer put the brakes on and control.

Think of it like a car. If that inflammation is your accelerator, you are pushing that accelerator as hard as you can, inflammation levels are coming up excessively. And what we're trying to do with the vagus nerve is put the brakes, put the brakes, put the brakes. But the brakes and the brake pads are only going to work for as long as they possibly can. If the accelerator constantly is being pushed, then the breakdown is going to occur, and the brakes can't do the job that they need to do. And so the vagus nerve starts to have a negative reaction. And it starts to not be able to control the inflammation, it starts to not be able to send information to the rest of these organs. And that's how we get into the stressed states and decreasing function of the vagus nerve. So the gut play is really, really important. But when we get into the other organs as well, we can talk a little bit about that.

**Dr. Eva Detko:** Yeah. Yeah. Let's mention the liver and the pancreas as well, that's a good idea.

**Dr. Navaz Habib:** Certainly. So we know that the liver has so many different functions. For those who don't know, you can probably count it and it will be around 500 different functions in the liver. The liver is our master organ for making sure that things don't get in that shouldn't get in. It is our filter it is our detoxification pathway, it's our blood sugar monitor, it's so many different things all wrapped up in one. And that information that comes from the liver to the brain is imperative.

And what happens over time is, the toxins that build up, that come in from our gut, that come in from our environment, the stress that we put on ourselves, what that does is it actually causes liver function to decrease. And over time, what we see is decreased levels of glutathione, which is the most important antioxidant in the body. We see decreased ability to handle xylene exposure and plastics that are off-gassing in our environment. We see decreased ability to handle metals and environmental triggers from the personal care products that we use. And as those toxins build up, and build up, and build up on the liver, it shuts those functions down, and then the toxins end up getting to other parts of the body.

So it's very important that we limit the amount of toxin that's making its way to our body so that our liver can handle the function, so that it doesn't take on a major toxic burden. Sometimes we have genetic issues with this specifically, some of us have MTHFR gene transcription issues and we have different SNPs. So we have to be very careful with what's coming in because liver function is imperative to ensuring that we work at an optimal level that we're able to recover and we get that information to the brain. And I also talked a little bit of a blood sugar balance and the liver really is the organ that monitors blood sugar. And a lot of people are dealing with metabolic disturbances, insulin resistance, diabetes, type 2 especially.

And what we're talking about here is the inability to monitor accurately what's going on with sugar levels, blood glucose levels in the body. And the pancreas has a lot to do with that as well, because what the pancreas does is, it releases insulin in response to high blood sugar. So if the liver is not able to get that information to the brain, then the pancreas is unable to function at its optimal either. It's very important that the balance occur and that both of them are working together. So the pancreas is going to respond by producing insulin in response to high blood sugar. We're going to monitor that blood sugar in the liver, send a signal to our brain saying: "Hey, blood sugar is getting a little bit high. Let's get the glucose into the cells." So the brain then sends a signal, again through the vagus nerve to the pancreas to produce insulin in response to this.

Now, if our cells, for example, don't have the capacity to take on all of this glucose, then we're going to have trouble breaking down that glucose. We're going to have trouble reducing that blood sugar level. And over time, this leads to insulin resistance. So the vagus nerve is really important in making sure that, that function of insulin is optimal, that we're not overburdening the pancreas, and producing enough insulin to get rid of blood sugar.

So dietary levels of blood sugar are important, but also stress. And stress plays a major role in this. So when we're under stress, our bodies are producing neurochemistry, neurotransmitters such as adrenaline, to handle that stressor. But we're also producing hormones, such as cortisol. Cortisol is very important. It comes from the adrenal glands and cortisol's major effect to help us handle stress is by increasing blood sugar levels. It actually tells the liver to increase the number of glucose molecules in our bloodstream.

Now if we're doing that and we're adding on dietary glucose and sugars into our diet, then what's going to happen is we're going to raise blood sugar levels to levels that the pancreas can no longer handle to produce insulin. And the cells can't handle because they don't want to take in any more glucose. So it starts

to store that glucose by shifting it into fat. And that's how so many people have overweight issues and weight-based obesity issues as well. And so that burden can be too strong for the vagus nerve, too strong for the pancreas. And that can lead to type 2 diabetes, insulin resistance, metabolic dysfunction, fatty liver. All of these things come up because of metabolic blood sugar disturbances and imbalances.

**Dr. Eva Detko:** Exactly. Thank you so much for explaining all this so well. So the conclusion being, there are quite a few things that can go wrong with the vagus nerve. But if you have anything that is that important, and has so many functions, then yes, by the same token, you're going to have a lot of things that can go wrong there. So we're talking a lot about the function, the symptoms of the function being compromised. And let's talk a little bit about how people can figure out what the function is. You did talk about the transit test, that's one of the indicators. But I'm specifically after the different ways that we can measure the vagus activity?

**Dr. Navaz Habib:** Certainly. Vagus nerve activity is actually relatively easy to measure when you have the right tools to do so. So the Bowel Transit Time Test is probably the simplest, easiest, cheapest test for you to do to see what's going on. It's not a direct measure of the vagus nerve, but it's enough to tell us if your gut is functioning correctly, and if there is some sort of imbalance between the parasympathetic and the sympathetic side. When it comes to actually measuring vagus nerve activity, the best thing to look at is called heart rate variability. Not heart rate itself, but heart rate variability.

Heart rate itself is the number of beats per minute. Ideally, that number should be somewhere around 60 beats per minute. In a very healthy athlete, you can get as low as 35 to 40 beats per minute. And that's a sign of optimal heart function, optimal recovery. But in somebody who's not an athlete, low heart rate levels can be a sign of over activation of the vagus nerve, which can be a problem on the other side, and lead to things like syncope, for example. But in the majority of cases, heart rate should be around that 55 to 65 beats per minute, telling us that we are functioning at a good level. But heart rate variability looks at a different measure. It's looking at specifically the time between beats per minute, and how much variation there is between that millisecond of time between beats.

So what we're looking at here essentially is, either we have very rhythmic beats per minute where it's almost like beat to beat to beat, and it's happening at the exact same amount of time, which means that the time between beats averaged out has a very low variability. That's not an optimal sign. That's not a sign of



good vagus nerve function. We should have rhythms that are a little bit off. Where we're not skipping a beat, but those beats are not exactly rhythmically milliseconds apart. That those beats are slightly varied in the number of milliseconds between each of those beats. And over a long period of time we can average out that measure to see exactly how variable the heart rate is.

And heart rate variability does change over time and it's measured over a period of time. But we're looking at that beats per minute over time averaged and the variation that occurs in milliseconds. The higher the number of milliseconds, the higher the heart rate variability, the better it is for your vagus nerve, the better your vagus nerve is functioning. So there's different ways that we can test this. One of my favorite is a tool that I've used for many years, mine's just recently stopped working so I'm getting a new one very soon, it's called the Oura Ring, OURA, ring.

And it's just a ring, literally a ring that you put on your finger and you wear. Literally, you can wear it 24 hours a day, six days a week, and charge it for about 10 minutes, and it's great for a whole week. But what that tool does is, it measures your heart rate variability while you're sleeping. And at times when you can set a moment and you can set yourself into a deep breathing pattern, just to help you get calm and to improve your vagus nerve function. So the Oura Ring is one of those wonderful tools that if you can get your hands on one, if you're able to invest in one, that's a wonderful tool to use.

Another great tool to use is one that I have sitting right here, called my Core Sense Elite HRV tool. And literally, you put your finger inside it like that and on your phone you're measuring the function of the time between beats per minute. And you can actually do this at the time that you're looking at it. So you actually get feedback on what's going on with your heart rate variability. Ideally, that number should be about 5 to 10 minutes. 3 minutes as the absolute minimum to get a decent average to be able to see what the numbers are looking like.

And then the amazing tool that I use to help people get into a state of coherence, which is heart rate variability is strong, we have really strong and low levels of breath rate and heart rate all combined, is a tool called Heart Math, which is a wonderful, wonderful tool that connects through Bluetooth to your phone as well. And you can actually see in real time what level of coherence you are in. Heart Math is an amazing tool, I am a big, big fan of it. There so many different ones and the cost for them is essentially minimal, it's like 120 dollars or 140 dollars for the Heart Math tool that connects to your phone, and you never have to pay for anything again with it. It's a very simple tool to use.

Heart rate variability is one of those tools that athletes use to see how hard they should push themselves that day. The higher their heart rate variability in the morning, the more they should be pushing themselves that day. And how quickly they recover is that direct measure of their heart rate variability. So that's why I like to use HRV as a major way by which we measure vagus nerve function.

**Dr. Eva Detko:** Excellent. And what I wanted to add to that is that I'm speaking to Dr. Rollin about heart rate variability and heart variability coherence in a separate session. So obviously, we're expanding on that. But yes, it's very good that you shared all your favorite tools. I love those too, they're absolutely brilliant. And I'm also doing a separate session on exercise and heart rate variability myself. So there's definitely going to be more information people to follow on from here. But fantastic, this has been such a wonderful session.

You've shared so much. You've got such an accessible way of sharing this information. I absolutely love this. Your book, very much likewise, the same, it's written in a very accessible way. So if people want to learn a little bit more about the vagus nerve, then this is the one book that I definitely recommend. And before we end, I obviously wanted to ask you about your favorite vagus nerve hacks, if you please.

**Dr. Navaz Habib:** Definitely. I've got a few that I use personally and with my patients. I go over about 20 to 25 different ones in the book itself. But my top three that I give to people are deep breathing, cold showers, and gargling. Those are the absolute three best. So deep breathing exercises we talked a little bit about. But if you can get yourself into a calm, relaxed, deep breathing state, you're going to push yourself in that optimal vagus nerve function, into that parasympathetic rest and digest state, and calm everything down. In order to add a little bit of stress and add a little bit of difficulty to making your breath calm, cold showers are a wonderful way to do that.

So the best way to do this is to jump into your shower, go normal, keep it warm for the first ninety five percent of it, but for the last 30 seconds, what you're going to want to do is, turn that shower dial as cold as you possibly can. You're gonna put it on the most sensitive area. Everybody is a little bit different. Personally, I like to put it on the back of my neck and I let it get really cold, and all of a sudden we get really, really tight, and we start to be under stress. And immediately what tends to happen is we breathe through our chest. But what we can do is train ourselves over those 30 seconds to decrease our stress level, and start to use our diaphragm to breathe again. And all of a sudden the stress of that cold water starts to go away, starts to decrease, and we get into a very

calm zone. So I like to think of the cold shower, almost like adding weight on to doing an exercise.

So, for example, doing squats, air squats is wonderful, but adding weight onto those air squats is just extra stress and extra work so that you can build through that. That's what a cold shower is in that specific case. And then the third one, and this is probably the easiest one besides the deep breathing to incorporate into your plan, is gargling. With gargling, what I recommend to people is keep a glass beside your sink, every morning and every evening when you're going to brush your teeth, add in 30 seconds of gargling practice into that. It's a very simple thing to do. Add a little bit of warm water into that cup, maybe a little bit of salt to help break down the plaque, or the bacteria, because of its antibacterial properties. And we're going to take a sip and we're going to gargle.

We're gonna hold that water in the back of our throat, but we're going to gargle as hard as we can. As hard as you can to the point where you actually start to tears from your eyes, because that's a sign that you're sending that signal to the right part of your brainstem to get the vagus nerve activated. At the same time we have to keep our airway open. We have to make sure that that water doesn't go into our lungs.

So we're trying really hard to hold that water in a place specifically. And we're calming ourselves down because we're using the muscles that we know that the vagus nerve innervates around the vocal cords. It's almost like adding three different things onto a single basic exercise. But gargling morning and evening for 30 seconds at a time is one of the best things anybody can do to really improve their overall health, and their vagus nerve function. So those are my top three vagus nerve hacks.

**Dr. Eva Detko:** Fantastic. Well, thank you. Thank you so much for being here. You are absolutely wonderful. We appreciate you so much and everything that you shared. Any final words for the viewers?

**Dr. Navaz Habib:** Thank you very much, Eva, for this opportunity. Thank you for listening today. And thank you for taking on this challenge of really wanting to be healthier, to upgrade your health to the point where you can then function and share that health with those around you, with those that you love, with your family, with your friends. If you want more information, you can always check out my book available online, *Activate Your Vagus Nerve*. You can go to [vagusnervebook.com](http://vagusnervebook.com). I have a bunch of little interviews that I've done with wonderful people to help teach you some of the tips and tricks that you can do.

And you can sign up for our energy boost challenge as well to help you get to your optimal vagus nerve function.

**Dr. Eva Detko:** Great, well, wonderful. Thank you again. Thank you for everything that you've shared today.

**Dr. Navaz Habib:** Thank you and I hope everybody has a very wonderful day and gained a lot of knowledge today.