



EVERYDAY IMMUNE RESILIENCE

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Hi, everyone. Sorry for the delay. We've had some technical problems, which have been pretty fun. But anyways, today's topic if you're joining us, is oxygenation for better brain health and how to get more out of your pulse oximeter.

So, a pulse oximeter is something that's gotten a lot of popularity recently because of COVID-19. People worried about the respiratory distress, and they're worried about if they're having some of these patterns where they have symptoms, where they don't have fever, but they may have some compromise in respiration and oxygenation and so forth. But for the most part, if your oxygen delivery is impacted, most people are going to significantly notice shortness of breath. They're going to have some significant issues with their function when they try to go up stairs or they try to do any kind of exercise. Any kind of exertion will be very fatiguing for them. Those are clues too, that your health maybe... Your lungs may not be functioning properly. It doesn't necessarily mean it's coronavirus. I mean, you can get pneumonia or any other kind of response, and those things can happen too.

So the way these pulse oximeters work — you can purchase these off Amazon, and they're only around \$20 to \$40. The apps are definitely not accurate. So I know there's lots of different apps that people have been using, but they are not accurate. They're not very good. So the way these work is you basically, you put it on your finger in here and then it'll start to... You'll see these red lights go on. And then you're basically looking at your heart rate and you have your pulse oximeter levels are the top number. And the top number, the highest number is 100%.

So basically when you look at that, if you're seeing levels that are below 95%, then you really are a little bit concerned. If results go below 92%, 90%, then there's some significant concerns with your health. You really need to get a medical exam, go to the hospital. And that's how it typically works.

Now, I've used pulse oximeter as part of my routine patient exam for over 20 years. And you can see different levels of pulse oximeter readings, as far as oxygen saturation, SP02 levels, with different people.

So we know that there's a small number of people that just get hypoxia and they have no symptoms, but just remember that's a really small number of people that have those symptoms. And it's not a bad idea to have a pulse oximeter at your house just to see how things are. But when you're looking at your levels, ideally you should be 90% or higher. And if you start getting below 95%, then you're starting to get worried.

But I want to point out a couple of things to you. There are some people that don't have anything wrong with their lungs, but their pulse oximeter readings are not, let's say, at 98 to 100%. So there's a range of a little bit less than ideal numbers, somewhere between 98 to 95%. So, some people may have a pulse ox of 96 or maybe 95 level. And that happens with people

that have sometimes... I'll give you an example. I had a patient that had Parkinson's Disease and they were so rigid and stiff, they couldn't expand their chest. So, the fact that they couldn't expand their chest was really causing their pulse ox readings to be low because they couldn't get enough deep breaths. There are people that are just really poor breathers that have really weak diaphragmatic muscles, and they just don't take deep breaths in. So, for people that are in the 95 to 98, they're still at the peak 90 to 100 ideal levels, you can have some pulse oximeter readings with those types of patterns.

Now, a lot of times when you do a pulse oximeter reading, the most common cause for it to be below 95% is there's an underlying lung issue or underlying cardiovascular issue, where you can't breathe in oxygen through your lungs and your heart has to pump it out into your tissues and then that will reflect the pulse oximeter reading [inaudible 00:04:00].

Now, sometimes you'll have people that if their pulse oximeters are really low, for some of them, if their circulation and blood pressure are really low, you can get some false readings that way. So be aware of that. So, if you really have really cold hands and really cold feet all the time, and especially when you're doing it, you can kind of — one of the things that I always like to do in an exam is touch a patient's upper arm and compare it to their fingertips. And you can quickly see if there's a temperature discrepancy, and that's a good sign of what their circulation is like. So, lots of hypothyroid people, lots of those who have low blood pressure issues have poor circulation patterns and those poor circulation patterns can... and low blood pressure can impact these pulse ox readings.

Typically in an office setting, what you do is you'd have a pulse ox, and if pulse ox levels are low, obviously listen to the lungs, listen to the heart. And then you do a followup test, which is called a spirometric test. And with the spirometric test, I don't know if you guys have done this before, but you basically blow into a tube. And as you blow into a tube as hard as you can, and try to expel all the air out, it measures something called your forced vital capacity. And then if that's impaired, then there's something happening with the lungs.

So, if you have, for example, if you had a very low pulse ox and it was below 95, 90%, a physician would normally listen to your lungs and heart and make sure everything's okay. Probably do a spirometric test really quickly and see if there's any issues with that. And then, do a chest x-ray or a CT and so forth. Also, with a pulse ox, it's always good to just have a temperature thermometer, just to see how your temperature is altogether.

So, those are the main things that are involved. And if people have asthma, during an asthma attack, they have bronchoconstriction, they're going to have poor readings on their pulse ox. Anything that can impede your respiration can be a factor. So, that's the basic principle of these. These are nice to have at your house, especially if you're worried about if you have any respiratory concerns that really require further medical attention. So, I can understand the popularity of them as well.

Now, I also like to use these all the time, unrelated to pulmonary issues, because for me, I work with a lot of patients that have neurodegeneration or traumatic brain injuries or childhood developmental disorders. And the brain has to have oxygen to function. So, if we ever see a

person has any poor pulse ox readings, SPO2 readings, we're really worried about the brain function altogether. I've had children before that have had asthma and their chronic asthma leads to low SPO2, and they just can't get oxygen to the brain and they have some developmental issue. It's one of the factors that may be impacting their developmental issues, not just getting the fuel they need to get the brain to work. So, we have to deal with their dietary and environmental allergies and try to improve their overall immune system and health to improve their asthma. And once their asthma improves, we can see their pulse ox is returned back to normal.

There are people that have really bad circulation and poor blood flow, and they don't have any significant pulmonary diseases. And with a lot of them, a lot of low blood pressure patients, we try to have them take things like licorice root. Licorice root helps your body to retain sodium. And we have them take sea salt throughout the day. We try to look at underlying mechanisms like a functional adrenal issue, underlying blood sugar issues like chronic hypoglycemics. It's really common for a hypoglycemic patient who has their blood sugar drop all day, have low blood pressure in combined with poor circulation.

So sometimes, you have to really look at the underlying issue. And it's really hard to say, just because your pulse ox reading is low, what's going on. So if your pulse ox reading is low, make sure you don't have a fever, and then look at your temperature discrimination between your hands and feet, check your blood pressure. See if any symptoms of exertion [inaudible 00:07:59] and so forth.

There is this very rare phenomenon with some coronavirus patients where they're just hypoxic and they have no idea that they were. And because of that phenomenon, people have become really worried and measuring pulse ox to see if their oxygen saturation is low.

The other thing that happens when your oxygen saturation gets low is your heart rate goes up. So another clue to someone that they're hypoxic is that they just notice that the heart rate is really up and they're just tired as well. So the good thing with the pulse ox, is it measures your heart rate. So when you're not getting oxygen to your tissues, your heart just pumps much, much faster in an attempt to make those things work. So, those are the general concepts of the pulse ox. I hope that helps you guys to get some basic concepts and understand the principles of it.

Just remember 98% to 100% is ideal. When you get below 90 to 95, you may have some functional imbalances in how well your lung functions are and circulation are. And then if you get below 95, especially if you have below 92 or 90, you really want to get checked out, especially if you had no symptoms before. The best thing to actually do is get your baseline pulse oximeter reading, and then have that for yourself and your whole family, and then see if that drops. Because some people in the family will have a pulse ox of 96, some people will have 100%. And then what you're really looking for is to see a significant drop between your baseline — what you're normally at — and something new to be to be worried about.

So, let me try to answer some questions here. **Do we need to use a medical grade device?** There's pulse oximeter... I have actually one of my office that is very expensive and it also does

what's called perfusion index and it actually measures hemoglobin. And that's several hundred dollars. But your basic ones like this on Amazon are very reliable. And as a matter of fact, what I like to do in my practice, is I have two of these. Sometimes I'll use the complete machine to get the hemoglobin concentration. But sometimes when I'm doing the exam, I'll put a pulse oximeter... I'll put it on both fingers just to make sure my results are accurate.

And the reason I do that is really sometimes more for heart rate. I have a lot of patients that have dysautonomia. They've had traumatic brain injuries and their heart rates are all over the place. And when their heart rates are all over the place, what you see is you'll have a resting heart rate of 60, then it goes to 90, then it goes 120. Then it goes down to 110. So the pulse oximeter is also a great way to look at heart rate. So, significant heart rate variability happens with people that have what's called dysautonomia. And dysautonomia sometimes happens when the immune system attacks their nervous system. It's a feature of some autoimmune diseases, and dysautonomia happens with many people after traumatic brain injuries. So those are good ways to look at that.

Okay, Jonalyn: **For spring allergies, how much Quercetin per day do you recommend, and should we take it at different times of the day?**

So the question is for some Jonalyn. My wife is helping answer questions, we're kind of stuck with the iPhone because our computers aren't picking up the cameras. I tried switching cameras, I tried my home computer, I tried to relaunch Chrome. I tried Safari, Chrome, I updated Chrome. None of them worked, so we apologize, but we're on a phone.

Okay. The question is how much Quercetin do you use for springtime and allergies? And the answer is you really don't know. You can start with a dose of, let's say 500 milligrams of Quercetin. And then you can go up to two or three times, four times that, whatever you need to manage your symptoms. So, your histamine response may be different at different times based on other immunological factors and some types of allergens may cause more of a histamine response for you. So, the best way to take Quercetin is maybe start at 500 milligrams and see if that quenches your symptoms. And then if it doesn't, you can kind of experiment the dose.

There's really no significant side effects if you're taking 2000 or 3000 milligrams of Quercetin. You just may be wasting your money if you don't need that much. **And then the other question is, how often do you take it?** And some people will take, let's say, 500 milligrams of Quercetin and it works great for them, but it only lasts about four hours. So they'll have to do it let's say twice a day to get through the day and not have any symptoms with the environmental allergies. But Quercetin is a very powerful, natural anti-histamine nutraceutical that can be very effective. Okay.

Margot. **What is a low reading?**

So, ideal reading with a pulse oximeter is 100%. And then 99 and 98, it's still very good. Once you get into 97, 96, 95, that's not necessarily a red flag for a serious disease, but that person doesn't have, let's say, functional or ideal oxygen levels. So, people that practice functional

medicine and just people that practice preventive medicine will want to dig a little bit deeper than they usually do, and they try to figure out what's going on. Once you get levels below 95, 94, 93, it's not looking good. Once you start hitting 92, 90, you really need to get your heart and lungs checked out and make sure you're okay. So that's basically the concept with the ranges.

Okay, Mary Lou. **What's the best way to increase blood pressure?**

I mean, I've struggled with this in my practice for many years. And what I've noticed is that when patients have low blood pressure, they're just not healthy. And there's some literature that shows that if you do have low blood pressure, that you actually have more risk for chronic diseases, more risk for autoimmune diseases, you have significant health problems compared to those that have normal blood pressure.

But low blood pressure is typically ignored in the healthcare system because blood pressure is routinely checked just to see if you have hypertension. And hypertension, it puts you at significant risk for stroke. I mean, that is without question. So when people have low blood pressure, they think, oh, well that's great! Because you have reduced risk for stroke. But actually it's not. Blood pressure's important for what's called perfusion and you need your blood pressure to get blood flow to all the tissues in your body, so you can recover and you can function at your peak. And you need proper and normal blood pressure to be able to get blood flow to your brain.

So, low blood pressure is not something that is good. I mean, it only reduces your risk for stroke, but it's not good for overall health. So normal blood pressure is like 120 over 80. And then you get borderline when you start going systolic 120 over 70. Once you start getting into the systolic levels of 100 or less, or diastolic levels which is second number of the blood pressure, in the 60 range, below 70 range, so let's say someone's blood pressure that's 90 over 65 — is really low. And in those cases, the question is what's causing it.

So for a lot of people, it's sometimes just, they functionally tax their adrenal glands. It's not really a disease process. If you measure their cortisol levels throughout the day, the rhythm, their cortisol output is very, very low. And these are these functional adrenal imbalances and you have to rebuild and kind of support the adrenal glands.

Biggest cause of that is just a person who's chronically hypoglycemic and lets their blood sugar drop. And they're just eating simple fruits and sugars all day. And that's happened for them for many, many years.

Then there's another subset of people that I've found in my practice that was an eye opener. And these were patients that had antibodies to their adrenal glands. So we measure a laboratory marker called 21-Hydroxylase. And if there's antibodies that are elevated above normal, that means that their immune system is attacking their adrenal glands. And the adrenal glands are involved with releasing and producing a hormone called aldosterone, which allows you to... is a key factor in helping you retain sodium, so you can maintain normal blood pressure.

So, some people actually have some subtle adrenal autoimmunity, and those people usually get missed in the healthcare system because the disease for adrenal autoimmunity is something called Addison's Disease. But with Addison's Disease, you have to have about 80% destruction of the adrenal glands to be diagnosable. So, there's lots of people walking around with adrenal autoimmunity, adrenal antibodies, that maybe have had 20% destruction of adrenal glands, 30% destruction of adrenal glands. And that causes them to have a chronic issue fighting low blood glucose, and low blood pressure issues, the rest of their life. And in those cases, the goal is to try to just manage their autoimmunity.

But at the end of the day, the things you do to try to raise blood pressure that are effective is sea salt throughout the day. That can be very beneficial. And then also things like licorice root extract. Licorice root extract modulates an enzyme called 11β -Hydroxysteroid Dehydrogenase, which allows you to retain more sodium. And it works great in trying to raise blood pressure. So those are the key things.

How much do you use? You start with the lowest dose of a capsule you buy, and then see if that helps raise your level. And there's a point where taking more of it doesn't have any significant effect and that's kind of the dose you stay at.

Okay, Sorya. **How can you improve cortisol awakening response? And how does estrogen dominance impact this issue, if it's applicable?**

Oh, so estrogen dominance isn't an issue with cortisol awakening response. Complete independence, separate, different glands, different feedbacks, different systems. But the cortisol awakening response is called CAR. So I used to have a slide in a seminar called jumpstart your CAR, which I thought was hilarious, but no one actually did. When I wrote my seminar slide, the heading with jumpstart your CAR, I thought the entire room was going to crack up and everyone just... No one did.

So anyways, I still find it funny. So the way that you jump start your CAR is, for the most part, you can also use licorice root first thing in the morning to help you jumpstart your CAR. And licorice root does two things. It helps activate aldosterone for sodium and sea salt, but licorice root also impacts the breakdown of cortisol to cortisone, so allows cortisol to circulate longer in the system.

And the key thing is to jumpstart the cortisol awakening response, is to, as soon as your eyes open... this is the key thing: As soon as your eyes open, your cortisol awakening response is kicking in. So as soon as your eyes open, you have to get up within that first 15 minute window, and you have to increase your heart rate.

So, one five, 15 window. So in that 15 minute window, you've got to get out there and try to do some high intensity... they can do seven minutes, there's seven minute workouts, lots of apps these days. High intensity, seven workout, where you're just doing jumping jacks for a minute, as many as you can, pushups for a minute, for as many as you can. But you have to get your heart rate up. And if you get your heart rate up and take some liquid licorice root, so you don't eat on an empty stomach. Or we can even take, there's licorice creams people use sometimes.

But any way you can get licorice in without getting nauseous, first thing in the morning, and then start doing a seven minute workout in the first 15 minutes when your eyes open.

And after about three weeks, you'll see your cortisol awakening response normalize. I have worked on cortisol awakening responses my entire career. It's the only thing that works and it works great. So you basically have to retrain your circadian rhythm. The other key thing with reestablishing your cortisol awakening response is you have to make sure you start... You have to start getting into a normal rhythm where you sleep at the same time, every single night, and then hopefully your body can wake up at the same time. But as soon as you wake up, you cannot stay in bed if you want to rebuild your cortisol awakening response. You have to get your heart rate up. Okay. Next question?

Okay. So, people like your car analogy.

Thank you.

They're just being nice.

Thank you for those, I like it.

Okay. Toby. **Can poor blood circulation cause high blood pressure?**

Well, I don't think it would work. I think works the opposite way. High blood pressure can cause poor blood circulation. But low blood circulation itself... Depends how significant and serious it is. I mean, if you're looking at basic physiological function, you're not going to see someone that has, let's say, poor circulation, like a typical hypothyroid patient. They don't have enough thyroid hormones. They don't get the nice modulating effects on their vascular system, so their circulations are really bad, cold hands, cold feet, freezing. But that doesn't cause them to have a high blood pressure. So, you rarely see people with poor circulation caused by, let's say, metabolic effects, most commonly thyroid hormones, hypothyroid patients having their blood pressure go up. So you don't typically see it that way.

However, some people have significant hypertension and blood pressure. And what happens when they have significant blood pressure is that they get massive vasoconstriction of their arteries. And if they get massive vasoconstriction of their arteries, they end up with cold hands and cold feet. And sometimes that, and some other factors can get a low pulse ox reading. So, if you have hypertension and poor circulation, I would most likely think your hypertension is probably the cause of your poor... is one of the factors that may impact your poor circulation, not the other way around.

Okay, Paolo. **It's just, if cortisol is very low at night?**

So remember if you guys ask about cortisol rhythms, when you measure cortisol throughout the day, there's a cortisol level in the morning... the way the Cortisol Adrenal Profile works. Let me go back further. The way the Cortisol Adrenal Profile works is you have cortisol throughout the day. You measure it in the morning, afternoon, evening, and night time. So you split up four samples of saliva collection throughout the day, and they can measure your cortisol levels. And

this test is highly sensitive, highly specific, it is the gold standard for measuring cortisol levels throughout the day. So, salivary cortisol testing is reliable. And then what they do is that, first thing is you see is if the levels are high in the morning, and if it's not initially when you first wake up, that's where people have the cortisol awakening response issue. And we talked about earlier, but I think the question now is, what happens when it's low at night?

So when it's really low at night, typically it's not necessarily bad, because when you look at the range at night, the range at night, you have to understand is a very limited, very small range. And just because your levels are slightly off at night, doesn't mean that it's wrong for you. So if your regular cortisol profile is higher in the morning than at night, you're just a little bit low. That's just may be not be falling into the [inaudible] and you're slightly lower. So I wouldn't necessarily worry about that too much.

The only other things that you may want to consider is that you may be starting to get into nocturnal hypoglycemia at nighttime and your body can't compensate for that over time. But for the most part, it's one of the least concerning patterns. The ones you're really worried about is cortisol levels spiking up at nighttime, or morning cortisol levels dropping.

Okay. Sue, **can a congested lymphatic system cause an overactive immune response?**

Well, that's a tough question. I'll try to answer as best as I can. And I don't know how to answer that because I don't routinely in my clinical practice know how to evaluate congestive lymphatic system. I mean, there's people that have... For the most part, if there's people who have like swelling in their limbs, if you don't move and exercise and you're solitary and your whole face, and limbs, and legs get swelling, that's a sign that you may have some lymphatic congestion.

But that alone doesn't typically cause an overactive immune system. If anything, it makes your immune system dysregulate. So typically, the definition of overactive immune system is when your immune cells increase in number, so you don't necessarily... would expect to see white blood cells go up just because someone has, let's say lymphatic congestion or swelling. You would expect the immune system to be dysregulated because really what the lymph nodes are, our lymph nodes are areas of the immune system where different cells come to communicate with each other and share information. Whether it's a memory B-cell, whether it's an antigen presenting cell telling T cells and B cells what to do.

One of the things we talk about in the Immune Resilience Program, and by the way, if you guys aren't familiar with the Immune Resilience Program, if you go to Dr. K. News, D-R-K-N-E-W-S.com, we put together a free program that talks about lifestyle patterns, things that you need to do to really improve your immune resilience. I also have read lots of articles on Dr. K. News by various topics, lots of things on the immune system and brain and autoimmunity as well. So please check that out.

But in the Immune Resilience Program, we talk about how important it is just to go for a brisk walk every day. And the main reason is because as you walk, your muscles start to pump your lymphatic system, that's really how you move your lymph. And that is critical to having proper

immune functions. So long answer, but for the most part, lymphatic congestion, wouldn't activate your immune system. If anything, it would just make it not communicate as well.

Okay. John Lynn says, **some say that nervous system controls immune system, what is your opinion for this? And does that mean we should focus on the nervous system instead?**

Well, some say nervous system controls the immune system because typically, all they understand is the brain or they're focused on the brain. You can say that with any field. You can say, "It's all about the immune system. The immune system controls the brain. Most of the brain are glial cells." You can say, "The gut controls everything." That's very narrow thinking. Yes, the brain does have a significant role on all body systems, and so does the gut, and so does the immune system, and so does the endocrine system. So it's an easy argument to make if you're in that one sided view, but it's such a limited way to look at things.

We do know there're studies that show brain injuries, dysregulated immune systems, and there's immune dysfunction. So those things that do happen, but I think, you don't want.. you got to be careful with people that try to treat everything through the brain and have no idea how the rest of the body works. Because to be quite honest, some of them can be very dangerous and it works different ways too.

There's people who are just focused on hormones and endocrine, and everything they see is through the filter of the endocrine system. There's people you've seen in functional medicine, "everything's the gut. Everything is filtered through the gut."

And those are basically with my experience, just very biased clinicians and diet bias clinicians are really something you need to be careful with, because usually with chronic complex diseases, you definitely don't want a biased clinician. You want someone that can understand the whole system because chronic diseases are an integrated web. Okay, next question. I don't want to go any deeper, it can turn into trouble.

Okay. Leah, **if you have an exaggerated high awakening cortisol response, how do you support please? Tried to meditate, remain calm, et cetera. What do you do?**

If you have a really exaggerated cortisol awakening response, you may be functioning at a higher level be honest with you. We look at these lab ranges and we see them like, "You should fit the bell curve and everyone should be the same." But there are people that perform at a very high level that have sometimes a very high cortisol awakening response, like the body's ready to go, they're ready to function. As long as she's not having significant insulin resistance issues, like they eat and they immediately pass out. Then if you have a high cortisol awakening response, you may be functioning at a high level. However, if you see high cortisol awakening response and there's clinical patterns of blood sugar issues, then that is a problem.

So the way you would tell the blood sugar issues, is if you just feel tired after you eat, or if you crave sugar throughout the day, or if you eat, you feel like you can function again. Those are all signs you may have a blood sugar issue.

Now, a dysfunctional cause of high cortisol awakening response is if you're nocturnally hypoglycemic. So when you go to bed, your body is going to use the glucose you had for your past meal for a first few hours of your fasting state of when you get into sleep. But then let's say you had dinner at 8:00 and then went to bed at 10:00, somewhere like around 12:00, 1:00, 2:00 your body's going to use up its fuel source of glucose called glycogen in the liver, and the adrenal glands going to release cortisol. And cortisol is going to start climbing up.

However, if you really have a low blood sugar state, you can turn to nocturnal hypoglycemia pattern, right in the middle of the night time, you can end up with a really high cortisol awakening in the morning.

So if you see high cortisol awakening response, and you have a blood sugar roller coaster ride throughout the day, you've got to fix your blood sugar issue. And you're probably getting nocturnal hypoglycemia, the most common cause of that is you're not eating enough protein or fat throughout the day, or if you have a severe blood sugar issue, you may need to get into a state of ketosis for awhile. So if you have high cortisol, it could be highly functional or it could be that you have a nocturnal hypoglycemic response. Anyways, next question.

Okay-

Sorry. I'm answering these questions really long. I don't know why, but I'll try to make them shorter.

Okay. Margo,

What do you think is happening with the clotting issues and COVID-19?

Oh, the clotting issues COVID-19? Yes. There's a paper in New England Journal of Medicine that was done and what they're finding is that these patients have antiphospholipid syndrome disorder. And antiphospholipid syndrome disorder is when you have antibodies that turn on against alpha-beta glycoprotein and cardiolipid protein, antiphospholipid proteins. And antibodies are measured against these. When these are all elevated together, and even antibodies to platelets, when these are elevated together, that's called a collecting if they are elevate twice — two measurements — that's called antiphospholipid syndrome. And what happened to those cases, they get significant clotting.

So for some susceptible subgroups, and we don't know why they're susceptible subgroups, there seems to be this autoimmune disease process that is turning on and with this autoimmune disease process turns on, what they're finding is that anticoagulants don't really work. The key thing with COVID-19 is that it's really adding fuel to the fire of people that already have some health issues, already have some subtle autoimmunity, already have some significant underlying inflammation, don't have enough antioxidant reserves. And then when this virus gets into the system and starts binding to different tissues that have this [inaudible] protein, then all these ugly things happen.

So there could be some people that have a susceptibility to have a combination of genes associated with antiphospholipid syndrome that get activated with the virus, and that creates a pattern.

We're actually working on a manuscript right now from a study that I collaborate with Dr. Aristo Vojdani, where we're looking at molecular mimicry for whether autoimmune antibodies turn on with COVID-19. And we're hoping to get that published or submitted in the next few weeks, I don't know how long it will take to go through the review process. It could take a month, it could take two weeks. Things are expediting right now with COVID-19 research, but there was no cross-reactivity with those target proteins to that. But I don't know. I think that answers your question. I hope that answers your question.

This is kind of two part, Deedeesays, **I could not do that upon waking, like the seven minute thing. Anything less energetic you can recommend to start your CAR?** And then Susan said, **if you can't do the whole thing, start with 30 seconds in an effort to... Can you explain that?**

Deedee, thank you for asking your question. If you can't do the cortisol awakening response, like doing a seven minute high intensity workout, then just flap your legs up and down as hard as you can, or arms hard as you can, for whatever you're capable of doing, and that's it. And you kind of just work your way up into it. It's something that will change very quickly over time. So if you woke up and opened your eyes and you just started moving your legs up and down, arms and going as fast as you can for like burst of 30 seconds, a minute, you did a couple of those, your body will adjust pretty quickly. I think within a very short time, you should be able to get up and get your high intensity exercise in. So that happens actually quite often, but it's definitely something you can do.

Debbie, if a person has severe adrenal exhaustion, is it helpful/ safe for them to eat a ketogenic diet or to do intermittent fasting?

So Debbie, if you have significant adrenal exhaustion, then you may have to... If you have a significant blood sugar disorder, just ... let me go back further. If you have a significant blood sugar disorder and you have not been able to control your blood sugar symptoms, like you're constantly in a roller coaster ride with your blood sugar dropping and then getting insulin resistance. If those levels are jumping up and down, up and down... Then sometimes the only way to fix that is to get into a ketogenic state.

If you have significant adrenal exhaustion, you may not want to jump into intermittent fasting. You may have to get some degree of ketone adaption, being in a ketogenic state or being adapted in ketosis before you even consider doing that. So you might have to try to get into a ketogenic state. The reason a lot of people say they have a hard time getting to ketosis and some people very much do, but majority of people that have a hard time getting into ketosis, and what I've seen in my practice is you look at their diet and they're not eating enough fat. They're basically eating protein way, way, way too much protein and not enough fat. And that's why they can't get into ketosis. Remember ketosis, you have to have 80% of calories come from fat.

So what I would recommend for you, if you have adrenal exhaustion and you're trying to get your adrenal glands rebuilt, getting into a state of ketosis is one of the best ways to recover your adrenal glands because you're stopping the blood sugar roller coaster rides that are important for your adrenal glands to recover. That's one way.

If you have significant difficulty in actually starting to use ketones efficiently, and you start to crash getting into ketosis, then you can use exogenous ketones like betahydroxybutyrate, or even just taking some MCT oils to help get your ketone levels up until your body learns how to use them efficiently.

The only problem is if you're taking exogenous ketones, your levels of... If you're measuring to see if you're in ketosis, let's say with the blood ketone meter, the levels are going to be partly skewed.

But some people that have significant adrenal exhaustion once they can actually eat enough fat and actually get into ketosis, and as they're transitioning, starting to take some MCT oil, and some exogenous ketones — can finally transition into ketosis. And the way they would know that is they stop taking... they don't need to take the MCT or ketones to get through the day. And then if they measure their ketones, they're in a ketogenic state.

And then you would probably want to stay in that state for some significant amount of time, maybe six weeks, eight weeks, nine weeks before even consider intermittent fasting, if you have significant adrenal exhaustion. And at that point, your adrenaline is already recovering and what you'll just notice once you stay in ketosis for several weeks is that you let your body fast on its own. So once you get into a state of ketosis, you'll wake up and you just won't be hungry, and you may not be hungry till 12:00. And as your body gets used to using ketones further then it may be one o'clock. And then before you know it, you're already doing, let's say a fast, and then you're already doing an 18 hour fasting window.

And then you're starting to get some intermittent fasting. Then you can go to a 16 hour fasting window and into an 18 hour fasting and so forth. So it's something you have to move delicately. The key thing is if you have adrenal exhaustion, the summary of the question is if you've severe adrenal exhaustion, being in a state of ketosis is one of the best ways to help it recover. You just may have some problems transitioning into it. And if you do, try to eat a u fat diet, I mean, make sure that's not the reason why you're not getting into ketosis — people sometimes eat too much protein or just have sugar. And then you may need to use some exogenous ketones, and MCT to help that transition. Long, long answer. I'm sorry, but I think I had seen another question here.

For those with possible candida, is it okay to eat fruits? I'm getting mixed advice about this. If you actually have candidiasis syndrome, it's not okay to eat fruit. You just need to get off all fruit and sugar. That's just that simple until you can recover. Actually, if you start to eat a lot of fruit and sugar, you're going to have a really hard time getting rid of your cravings. So if you're at a point where you do have issues with the yeast overgrowth syndromes, whether it's in the gut, or whether it's in the upper respiratory system, or it's vaginal, or whatever the case may be, you need to just 100% stop eating anything that's sweet.

Part of the problem, half the problem is there's a sugar craving. So sugar receptors in the brain that activate dopamine. When you taste something that's sweet, and activates your dopamine receptors, and it makes you crave it. Those cravings can go away in about three days. So for most people, if they constantly just sample a little bit of low glycemic fruits, they're just going to constantly have sugar cravings, and they're going to overeat, and they really are not going to be able to fix the pattern. So the key thing is to just get off fruits and anything that tastes sweet altogether.

Okay. Marbelon, **Are there any gender differences in the keto diet?**

I'm not sure what that means also, but the only thing I know about ketogenic diet is when men do it, they lose a ton of weight and when females do it, they don't lose as much weight. And if the spouses are doing together, the wife is always upset that the husband has lost all those weight and they haven't lost as much. That's the only gender thing I've seen with ketogenic diet. Other than that, the dietary guidelines and everything is pretty much the same.

Debbie, **so getting into ketosis will not stress the body further making the adrenal tissue worse?**

Well, getting into ketosis should not cause your adrenal glands to get worse, but you are putting a little bit of...there's transition state when your body is converting from a blood sugar state, from a system using blood sugar versus ketones. And then that transition period, which could be like, I don't know, let's say a day, at the most two days, if that's happening the key thing is just to get in ketones. That's the key thing. If you can take in some MCT and take samples of... some people have taken little capsules every couple hours, and some exogenous ketones like beta hydroxybutyrate every couple of hours. And then they'll get past that window of time. And then their body, once it's in the ketosis, the adrenal glands are taking a break.

So if your diet is actually very high, in that 80% of fat intake and you're taking exogenous ketones, despite having adrenal exhaustion, you should be able to get in there. It might be rough for a day or so, but then once you get in there, you're going to have this massive recovery phase for as long as you can maintain your ketogenic state.

Okay, I got lost on my computer, I'm really sorry. **Best resource for someone wanting to get into ketosis?**

I really like Thomas DeLauer, he's got a YouTube channel, and I think he does an excellent job explaining everything about ketosis. And he's got an introduction to ketogenic diets and some great videos. So, I actually refer some of his videos to my patients. I really like the way Thomas DeLauer has put together the information I think he is a very talented and knowledgeable person when it comes to ketogenic diets, and I would recommend him.

This is kind of a two... **Is intermittent fasting okay if you have Hashimoto's? And then someone else says, what about starting keto diet, if you have Hashimoto's?** So, keto and intermittent fasting.

There's no problem. I mean, sometimes the patients that have Hashimoto's ketosis is very impactful for them, for their Hashimoto's or their autoimmune disease. And the reason why is because when sugar levels fluctuate up and down, whether your blood sugar levels drop in a hypoglycemic, or whether you get an insulin surge, there's activation of a mediator called IL-6, interleukin 6, and then activates a cell called Th17. And Th17, basically it's fuel on the fire of autoimmune disease. So there are many patients who have significant severe autoimmune diseases, and they really can't get their blood sugar stable throughout the day. They've tried to eat more frequently. They try to cut down the carbs, they just can't do it. And for some of them getting into a ketogenic state really makes the big difference for them.

I put a lot of my neurological autoimmune disease patients like patients that are suffering from MS or have antibodies to myelin, basic routine on a ketogenic diet, because what recent research has found is that ketones aren't just a fuel source, but ketones have been shown to dampen brain inflammation, and neural inflammation. And there's been some early research that it even speeds up remyelination.

So, I use ketogenic diet all the time. Now, intermittent fasting for Hashimoto's patients, again, can be good or bad. If a person jumps into intermittent fasting and their body can't adapt to get into ketosis, they can actually... the body can't adapt to get into ketosis. They can absolutely fall apart and feel worse. So I think the concept of going to ketosis first and then getting comfortable with ketosis and letting your body then start to get into intermittent fasting as the person notices their hunger. That would be the best way to do it if you have an autoimmune disease like Hashimoto's.

Okay. Margo. **Do you think it's possible for vegans to be on a candida diet, especially if they can't handle ketosis?**

I honestly don't know. To be honest, I have a really hard time with a lot of the things that we try to do in clinical model with patients that are vegan. I'm really at the point in my career, I think a vegan diet is great for some people. In my practice, working with chronic diseases, I just don't feel like I can find enough exceptions for various things to make enough difference for them. So I refer them out to health care practitioners that work with patients that are vegan. I don't have anything against it. There's some people that have a vegan lifestyle that are extremely healthy and work well. When people get a chronic disease and you're trying to get fat in and you're trying to stabilize protein and you're trying to do some food restrictions. For example, you get a vegan patient who has significant RA and lupus, and they have antibodies to lectin and they can't control their blood sugar levels.

I can't find enough options in a vegan diet to figure out a way around that. So for the most part, there's lots of health benefits for a vegan diet for general health. But for my practice, I work with a lot of chronic disease patients that react to multiple food proteins and they also have the restriction of being a vegan, it becomes extremely, extremely difficult. I don't know if I answered that question, but I don't have enough experience since I only work with chronic disease patients, I don't work with patients that are practicing a vegan diet for the past 10 years, because it just becomes more frustrating and they really need to work with maybe a

doctor that is chronically sick themselves and knows how to do things with the vegan diet. I haven't been able to figure that out.

Okay, Laurel. These talks, it seems that we have issues with hearing. Consider adding a mic to your setup. [crosstalk 00:46:23]

Yeah. We have a mic that's right here, but it doesn't work today.

And today it doesn't work and I'm actually working off my phone. Normally I work off my computer, which has a nice camera and a nice microphone. But for some reason, the updates with Facebook aren't picking up cameras or with Chrome. So I know the video and sound is not very good, but that's the backstory.

Mary Lou Peterson. **Your veggie mash is amazing.** That's nice, thank you.

Then the microbiome mashup, we made it a program called the 3D Immune Tolerance and my beautiful and intelligent wife, who's also a doctor put together that program. There she is. She's helping me with the questions. She's the one who put together the microbiome mashup concepts, and also teaches how to do it in the course. You just mix a lot of vegetables together and then mash them all up. That's just a really good way to support your health and improve your microbiome diversity. But thank you for your comment.

Okay. That was nice. Let's see. Well, people are saying it's good enough. Thanks for sticking with us. Today was -

Yeah. Thank you for sticking with me. Sorry. I was about to quit. I was so frustrated.

That happens. Okay. Let's see. Sorry. It's kind of a mess. Sorry. There's this question about air hunger. **How do you explain the air hunger?**

Air hunger.... I'm not really. I'm not sure I can answer that question.

Okay. I know. I'm sorry. I lost it. Hold on. Jonalyn... **I notice when I forget to eat, I get immediately hungry afterwards. I am more sensitive to chemicals. What's going on here?**

Jonalyn, I'm not sure what's happening with your blood sugar and your chemical sensitivity. They may be somewhat independent, but if you're getting more sensitive to chemicals more that means you're losing what's called chemical tolerance. This is one of the early features of someone transitioning into autoimmunity. The key concept with autoimmunity is you start to lose your tolerance and you start to notice reaction to more food proteins, and then you start to notice reaction to chemicals.

What's happening there is, there's regulatory T cells that are dysfunctioning. There are dendritic cells that are over-reactive. There are Kupffer cells that are dysfunctioning. These are all parts of what immunology they call loss of immune tolerance. We put together a program called the 3D Immune Tolerance, which is Diversify, Distinguished and Downregulate, which are the clinical concepts, how to improve your immune system.

You can check out that program at Dr. K News. It's a program you have to pay for, but it goes into lots of videos and workbooks and gives you diets and recipes if you're interested in it. But I also have articles on microbiome diversity at drknews.com that can really help you understand a lot of the principles and some things you may start to do yourself without having to purchase the program if that's an issue for you. But anyways, I think the blood sugar issue is probably independent and your chemical intolerance is probably just a loss of immune tolerance in you. You definitely want to pay attention that.

Okay, Jackie. **Most reliable test for possible candida, which do you reckon?**

Most reliable test for possible candida. Let me explain this. So candida is a normal part of the flora, microbiome flora, vaginal flora, and so forth.

So the key with this is it's not that it's an infection. It's an overgrowth. Something's causing your overgrowth. So whether it's immune suppression or some kind of an infection that's wiping out the immune system in that local area. And a swab, a vaginal swab or upper respiratory swab can be useful to see if there's a candida overgrowth. GI panels typically measure, they do a mycology analysis with a comprehensive stool analysis. They see if there's any overgrowth patterns, that's one way to do it.

And then you can measure your levels in blood. If the blood levels are showing you have like a systemic response, it's similar to what they call endotoxemia means like the bacteria, in this case, yeast, is getting into circulation. There's overgrowth in the, let's say the gut, and now it's getting into circulation into the blood. So you would have to have like a yeast overgrowth and intestinal permeability.

When candida gets into the blood, you'll actually have very high levels of candida antibodies on the blood test. And that is going to cause some serious inflammatory issues with the person. Most people that will have a candida overgrowth issue, will have it in that localized tissue themselves, whether it's their gut microbiome or their vaginal microbiome or their upper respiratory system. We have a chronic sinus issue with candida and those typically, or some degree of immune dysregulation, immune dysfunction, immune suppression that's allowed that to happen. Some of those cases, to be quite honest, are really complex. I don't have a good answer for where to go next. In a clinical setting, we have to work very hard to figure out how to get their immune system healthy, to change those patterns, especially when they're in the sinuses.

Okay. Stuart. **Is there a new test yet to see if you are Th1 or Th2 dominant?**

Well, the test has always been around in research settings, which is a cytokine stimulated test but the problem we have is it's not commercially available. You can measure cytokines that are Th1 or Th2 with all your conventional labs, like LabCorp, or Quest. And that's okay, but it's not a very good test because you have to have a such a high degree of inflammatory cytokines to measure if someone's in Th1 or Th2 patterns. It's really, really expensive.

What they do in laboratory studies is they do what's called the cytokine stimulated test, and they use the trigger called pokeweed mitogen and they take T cells, immune cells, and they activate a trigger to them. They see what kind of cytokines they release. That's the gold standard test. That's a test we used to have. I know, as a consultant to Cyrex, on their scientific advisory board, they're working to bring that test out soon. That will be a commercial test.

Now, you have to ask, why is this not commercially available? Because most practitioners in the world don't care. Pretty much the only ones that really care are people that do functional medicine and are really trying to balance the immune system with diet, nutrition, and lifestyle. It's not used to diagnose a disease. It's just a state of function. Since it's just a functional test that doesn't really diagnose a disease or change the treatment protocol in conventional medicine, it's not very popular for laboratories to run. Hopefully we can get some of the testing that's been well established in the research available commercially. I know Cyrex is working on that.

Okay, Kurt. **What tests must be utilized to really determine thyroid health? I'm cold, fatigued, thinning hair, feeling buzzy in my body, but the standard thyroid tests come back normal. Amy had normal results for years until you did more thorough testing.**

Yeah. There's only so many thyroid tests that are available. TSH, T4, T3, free T3, free T4, thyroid-binding globulin, T3 uptake, TPO antibodies and thyroglobulin antibodies and that's it. There are people who have all those levels normal. That's kind of the reason I wrote my first book *Why do I Still Have Thyroid Symptoms When My Lab Tests Are Normal?*.

Trying to answer your question. So I would say if I want, I want to check all those. I wrote 24 patterns of how the thyroid can go wrong in that book. I think the long answer for your question is to please read my book, my thyroid book, and hopefully they can offer you some good suggestions.

Okay. Tina, **I have been doing a detox to get rid of mycotoxins from mold exposures, which has contributed to my Hashimoto's condition. Can mycotoxins also impact blood sugar as I am now in testing at a pre-diabetic level.**

So the question is, can mycotoxins impact blood sugar?

Yes. She's doing a detox get rid of them.

Well, it's hard to say, because I'm not sure what you define as detox. Different practitioner have different definitions of it. But for the most part, mycotoxins have the ability to activate immune responses and so forth. If they activate an immune response with someone, it gives you a clue of what is ready to be activated, that's already dysfunctional. So typically you won't see that. However, we do know there's some links between chronic inflammation and dysregulation of insulin receptor sites that could be possible. So I think that's kind of happening. But it's also possible you may have some underlying islet cell antibodies or A2 antibodies.

There's a condition called LADA, latent autoimmune diabetes in adulthood. You can check that with what's called islet antibodies or GAD65 I-A2 antibodies. If any of those were elevated, that would be something to look at.

There are many people that do have significant environmental triggers that didn't turn on an autoimmune disease. When someone's dealing with environmental trigger, where they have new onset of symptoms, it gives you a clue of the potential autoimmune response. So for example, if someone was dealing with an environmental toxin, maybe they have significant mycotoxin levels that are measured and they start to have significant brain fog or dizziness.

We definitely check, number one, to check neurological autoimmune markers. For another person, if their blood pressure drops really quickly and they can't get the blood sugar back up, we might want to just look it through adrenal gland antibodies like we talked about earlier.

For someone else to get inflammatory gastrointestinal symptoms that are off the charts, for them, we might have to look at things like ASCA, ANCA, tropomyosin antibodies. So if you're having a blood sugar totally dysregulate like that with a mycotoxin load, it is quite possible that you may have an underlying autoimmune response against the pancreatic tissue. When the pancreatic tissue gets destroyed, those pancreatic tissues also have some impact in causing some blood sugar shifts.

Okay, Margo. **Does he believe in urinary mycotoxin testing? What about organic acid testing for candida and mold?**

I think when it comes to any kind of laboratory test the word "believe", I know it's just a question, but the word believe is something that is not the best way to explain it because every test has limitations. Some tests actually don't have... With any kind of laboratory tests you're looking for reproducibility. So one test that's done repeatedly you have similar results and reproducibility between not just the same lab, but within other labs. And you're looking at what's called specificity and sensitivity, and those are actually measurable and those are done for all biomarkers in healthcare.

So the question is, is the urinary mycotoxin test reproducible, reliable and so forth? And the problem is that technically, yes, it should be reliable, but there's just some really poor quality labs doing the testing. There could be some reproducibility issues from one.

So that's something to consider it. But for the most part, urinary mycotoxins could be a very good tool to determine if there are any issues with byproducts of mold. So I find it useful. I don't know if that means I believe in it, but I think it's a useful test. But there are some limitations with reproducibility, and mycotoxin levels do fluctuate as a consequence of the pathophysiology of the condition. That's the problem with measuring urinary mycotoxins.

From James. **Can a pulse ox be used as a preliminary screen for sleep apnea?**

Sleep apnea, you really should get a sleep study done. You're not going to find enough useful information from a pulse ox. However, if it's bad enough and you have a pulse ox on and, and you're asleep and someone can measure it and your levels do drop, you definitely, you still

want to get a sleep study. At the end of the day, just to see, have a baseline and what's functioning, what's not working and so forth. But I would say if it's bad enough, you might see your pulse ox SpO2 levels, oxygen levels change in the middle of the night when you're asleep, someone can look at that for you. But for the most subtle ones, you're not going to see those significant changes.

Okay, Hortensia. **Regarding oxygen levels, are the percentages different for above sea level?**

No, there's no differences between your body's oxygen capacity versus whether you're at sea level or not. That could just impact your hemoglobin concentration, but the test numbers and parameters of the test will show the same despite the altitude you live in.

Hasnick, **which neurological autoimmune markers do you look into?**

Question is, which neurological autoimmune markers do we look into? So there's general autoimmune markers where you're just looking at structural proteins in neurons. The most common ones are myelin basic protein and myeloligodendrocyte, MOG and MBP. Those are the classical markers for things like demyelinating diseases like MS, or idiopathic peripheral neuropathies and things like that. You can also look at things like synapsin, which are proteins. Alpha, beta tubulin, those are proteins that measure, they keep the structure of neurons. Sometimes you got to check all of them.

Now, then you can go deeper as you can specifically test antibodies for different targets of the brain. So you can measure things like cerebellum antibodies to look at autoimmunity specific to the cerebellum, which is very common in Hashimoto's patients, very common in celiac disease patients. Or you can look at specific receptors in the brain like dopamine receptor, or a GABA receptor, those happened with things like PANDAS or different neuropsychiatric disorders.

So you can have antibodies, different proteins or different enzymes or different tissues or to myelin. There's at least 30, maybe even more, 30 tissue antibodies for the brain. It really depends what your goals are and what the disease presentation is. The most common one tested is myelin basic protein, myelin basic protein and myelin oligodendrocytic protein, MBP and MDH, MOG.

Okay. Anna. **What is the reason for exercise triggering fatigue for days and lowering already low blood pressure?**

There could be more than one thing happening with that. So typically if a person exercises, well, the first thing to think of just far as recovery rate of any kind of any type of exercises, is your free radical antioxidant status. Our body makes antioxidants all the time and the foods we eat, especially foods really high in plant phenols, for example, help raise your antioxidant system. So really colorful fruits, super foods like berries, acai, pomegranate. Those things all really help support our antioxidant systems so we have more antioxidants.

And then we're exposed to what are called free radicals. Free radicals, these are unstable electrons within cells and free radicals help keep them stable. Antioxidants, keep these free

radicals stable, and they happen from pollution or toxins or our body makes free radicals too to fight infections if we need them.

But when you exercise, you actually have oxidative stress, muscle tissue breaks down to some degree and your free radical levels actually go up and skyrocket during exercise. But what happens is after you exercise, exercise itself activates your antioxidant-producing enzymes, and you get a huge surge of antioxidants that come in.

For some people who have lost their ability to have a healthy antioxidant system, when they exercise, they don't recover. So the first thing I think about clinically is when I see a patient that just, they can't even do a 10 minute walk or a 15 minute run, that they have some significant inflammatory free radical process happening that they cannot make enough antioxidant reserves to meet that demand. That would be the first thing. The low blood pressure throughout the day is not a normal sign. That is again, that could be a subclinical adrenal autoimmune response.

So to me, with your history of, you get exercise and you get really, really tired for days and your blood pressure drops, I would have to, as a clinician, I'd want to make sure you don't have adrenal autoimmunity and you want to check 21-hydroxylase antibodies. Something really triggering the inflammatory response, which could be the autoimmune disease itself, environmental triggers, food triggers, a combination of things that play a role.

Soria. For improving CAR, will licorice root tea work? The other question was, what if you can't take licorice root?

So the question is, for improving the cortisol awakening response, CAR, can use licorice root tea.

You can use licorice root tea, but you better like make a gallon of it. And then that's to start with. You're just not going to get enough of the active flavonoid with the tea. You're going to need to actually take in a supplemental form to really make a big difference.

So licorice tea alone would probably not be enough. If you can't take licorice, you're just kind of stuck with taking sea salt and just try diet and lifestyle strategy to support your adrenal glands, which it could be a long answer. I don't want to really go into it, but for the most part, you can just use salt and just work on getting your blood sugar stable. That would be the two most important strategies to help with that pattern.

Okay. Marylou. **How about exercise causing insomnia?**

So there's lots of different reasons that actually can cause insomnia. One of the reasons actually that's causing insomnia... we see a lot. I've seen a lot in my practice, is actually... I don't have a good... It's not a nice thing to say, but there's some people that get neurodegenerative changes in their brain, especially with their cerebellum. So early cerebellar degeneration and especially with their cerebellums. Early cerebellar degeneration. And the way you would find that is you have balance issues, and maybe when you reach out for things, you get a little bit of termination tremor. But people that have cerebellar, early sense of cerebellar degeneration... It

actually, again, also very high in Hashimoto's patients because antibodies to TPO, which are used to bind to thyroid cells, also bind to the cerebellum and they can cause that collateral autoimmune response. So we see lots of early cerebellar degenerative disease in Hashimoto's patients. The cerebellum is an area of the brain that fires directly to the autonomic centers in the midbrain that control your heart rate and your sympathetic response. And it's a pathway through the [inaudible 01:06:41] to an area of the brain called mesencephalic reticular formation, but it's a very known pathway and it just activates the sympathetic response.

So for some people, when they have too much motion and too much movement around, they just activate this area of the brain and they can't sleep. That's the most common reason I've seen exercise cause insomnia.

The other reason why exercise caused insomnia for some people is that they exercise and they burn off all of their glycogen reserves. And then they get a cortisol spike and then they can't fall asleep. So you really want to make sure you're getting enough fuel into your diet, and make sure you don't have... If you suspect you have cerebellar issues, you may want to try and do exercises that aren't as stimulating, that require as much of your balance. Like you don't want to work out in a Bosu ball or run on a treadmill that's unstable or run in a really crowded environment. May want to just do some non-stimulating exercise where things aren't moving and you're not stressing your balance system, but still raise your heart rate and see if that helps. And if it does, then that could suggest you have some early patterns of cerebellar degeneration, and you should be evaluated by a healthcare professional to help identify that.

Okay, a few more. Marty. **Is there ever complete healing with leaky gut? And post-menopause, it seems that keto diet and bioidentical hormones help. Then gut bloating inflammation comes back. I wonder if bowels will ever go back to normal.**

You can absolutely heal intestinal permeability. Actually, our team is working on finishing my third book, which is on intestinal permeability. And intestinal permeability is pretty complex. It's not as simple as just, you take a few nutrients and then it heals. It's a dynamic process and it's lots of variables and factors. But not all of your symptoms may be due to intestinal permeability. Now, there are some people that will never fix their intestinal permeability. It's because they have antibodies to their gut. They have autoimmunity. So they have incurable autoimmune response to their gut, and it just flares up off and on.

And you can measure those with antibodies to gut proteins, ASCA, ANCA, and tropomyosin. So those are some pathways that take place. But there are people sometimes that are just struggling with chronic gut issues from underlying undiagnosed things. Like some people actually have celiac. Some people actually have gluten sensitivity. So those could make a person always struggle with inflammatory... a relapsing, remitting, leaky gut pattern. So that may be what you may be dealing with, but it's hard to say.

But you can absolutely heal leaky guts. Pre- and post-testing studies have shown that very clearly. You just have to know what the cause of the leaky gut pathways are. So I think in the first draft of the book, we had 24 different mechanisms, how you can get leaky gut. So it's not just a bad diet. Lots of different factors.

Okay. Here's a question from Lauren. It gets asked a lot. **Is it true that you are able to regenerate neurons?**

Is it true you're able to regenerate neurons? Yes and no. Let me explain the concepts here. So neurons... So there's a set number of neurons that just die off. And age by itself is the factor of how many neurons we lose. And when you, I, have age, combined with traumatic brain injury and combined with inflammatory conditions of the brain in certain genes that promote neurodegenerative protein aggregation issues, and so forth, you can get different degrees of neuron loss, one person to the other. And when you lose neurons, you do have hope because the surrounding neurons can branch over the dead neurons to a healthy neuron and you can get function back. And that's what's called plasticity. So despite how many neurons you lose, you can activate plasticity and get your healthy neurons to connect around them.

So function comes back and that's fantastic. There's been some studies where they found some small degrees of STEM cells in the medial hippocampus areas of the brain, medial temporal areas of the brain, I should say, some stem cells in the olfactory bulb, where the cells can actually get regenerated. The problem is that there's such small numbers of them that they don't clinically matter. So technically there's been some research with some stem cells that have been... In certain regions of the brain that have potential for neuron growth again, but in a real clinical setting, there's not enough of them to make a clinical impact as far as what we understand with the brain right now.

Okay. Tammy. **Can Raynaud's Syndrome affect the readings on a pulse oximeter?**

Yes. If you do have Raynaud's phenomenon, you have a massive vaso... Raynaud's phenomenon where your hand has a vasoconstriction-dilation phenomenon.

And if your hands are turning blue, your pulse ox is going to be really abnormal. So you're going to see these different levels of change with it. But surprisingly, even when some people, when they go into a cyanotic state where their hands turn blue from lack of oxygen, from a vasoconstriction, sometimes their pulse ox levels are still within normal.

So as long as... understand the limitation of the pulse ox is, the pulse ox is measuring in that area, it's throwing a red light and infrared light and doing a mathematical calculation to give you an idea how much oxygen is there. So even if you... even in states of reduced red blood cells or even a vasoconstriction response, there's still enough of the red blood cells in that area where the light's going through to make things look normal.

So be aware that it may not be the same for everyone. The key thing with the pulse ox, though, is if you consistently see your levels below 95, that's a red flag. If you see your pulse ox lower than your baseline dropping really quickly, that's a red flag. And if your pulse ox is... Definitely gets in below 92, you definitely need to go have your lungs and heart evaluated soon.

Okay. Yeah. Tina. **Can you ever heal from hypoglycemia-like symptoms, where your blood sugar measures around 110, two hours after you eat, even though you need to eat again because of lightheadedness and dizziness, if you don't eat.**

Yes and no. It depends on what the mechanism is. For some people they have adrenal autoimmunity that subtle, it's progressing, and their autoimmunity is constantly causing an issue. And unfortunately, right now we don't have a cure for autoimmunity. So those patients may be suffering from this low blood sugar pattern for the rest of your life.

For other people, sometimes they just need to get their blood sugar handling system stabilized. If they eat regularly throughout the day, they have to get a normal circadian rhythm. And their adrenal function improves. It's not really disease state, but they just have better physiology, physiological functions happening. And they can see their blood pressure improve and their low blood sugar improve. But it is challenging. There are a lot of patients that are struggling with this for their whole life. And there could be some genetics that play a role with some people. But for sure, you can improve it [inaudible] with most people with diet, nutrition, and lifestyle strategies.

Everin. What dosage do you recommend for someone taking RepairVite and ClearVite by Apex Energetics? He's taking them for leaky gut and liver support. One scoop twice a day of each. Can they be mixed together?

So the question is specific to products from a company called Apex Energetics, RepairVite and ClearVite. I was involved with helping formulate those products, or I formulated those products. So I can answer a little bit. There's no... The recommended dosage is really the best thing to use in the label. You can absolutely mix them together with a drink. And there is a diet-nutrition protocol for both the ClearVite and RepairVite for over a three week period, of how to take it, where you cycle up and cycle down. If you have ordered the product, either ClearVite or RepairVite, you should have gotten that pamphlet with it. But even if you just want to take a scoop full of each of those mixed together with water daily, or even twice a day, you can have no problems and it's very therapeutic. Well, not therapeutic, but it provides a high amount of nutraceuticals that can support you based on whatever your various needs may be.

But it gives you a huge load of antioxidants and nutrients.

Okay. D.D. She's saying, **would glutathione be helpful if you don't recover from exercise? Taking glutathione.**

So when you don't recover from exercise, there's really two parts to it. You want to increase your superfoods. You definitely want to eat foods that are really colorful. You definitely want to take a lot of antioxidants. Glutathione can be one of them. You can take it... Most of the things like grape seed extract, pomegranate extract, beet extract, beet root extract, those are all things that can really support your antioxidant system. But a lot of times the underlying issue is, there's a chronic inflammatory trigger that you have to identify, whether it's environmental or just an autoimmune disease itself, or infection of some kind. Those are all the things that you have to dig deeper for to make the biggest change.

Okay. Lauren. **Do you ever get to a point with your patients where they can completely stop taking supplements, or do you feel like they will always have to take at least a few?**

Do I get to the point with my patients where they have to completely stop taking supplements? Yes. All the time. So I actually leave that decision up to my patients. So for my kind of practice, I work with patients that have chronic diseases, whether they're dealing with autoimmunity or dealing with the recovering from brain injury, or they have a neurodegenerative disease, and those conditions are not caused by a nutrient deficiency. We're just using nutraceutical compounds to modulate their physiology. So the physiology may be inflammation at some point, or the physiology may be a prostaglandin imbalance for some period of time. So we support them based on what their needs are.

And patients, they learn how to use supplements in my practice. And once they learn how to use them and they understand what they're used for, they really start to make their own decision when they feel like they need to take them. So some patients, for example, I work with... autoimmunity is a really common condition I see in my practice. And when we may work with them with diet, nutrition, and lifestyle, there's a point initially where they have lots of inflammation, lots of things to deal with, and they start to calm down and they go into a remission state, and they just don't feel like they need to take any supplements. And they don't. And then they may have something happen where they get a flare-up. And then all of a sudden they feel like they need to take some natural anti-inflammatories and they need to support the leaky gut more. Or they ate something that really triggered their gut, And they take once for a few days to help calm them down.

So, yes, because, just based on how you're using them. So the key thing with supplements, and we're not trying to do it to... "there's a low level of nutrient and we're trying to raise it." We're typically trying to use it to support physiology and function for whatever the patient's needs are at that time. So I think I answered that.

Okay. Sean. **If one has been strictly avoiding gluten, casein, soy, and egg for five plus years, but still tests positive via SIgA from DiagnosTechs, does that suggest they are unknowingly being exposed, or they have some other immune process underway?**

Gluten, egg, and soy, period for five plus years, and you still have some antibodies show up. It means you're still getting traces. It probably means you... One possibility, the testing... There's false testing that's possible always. And the other possibility is you just are getting trace exposures. So trace exposures that happen all the time. And it's possible that you may not even know you have trace exposure. So that's one issue. We also know that there's some proteins that are very similar to gluten, like grains have a similar protein structure. So even though you may be eating gluten-free grain like corn, sometimes the antibody structure is so similar that it registers as the antibody level being high. So cross-reactive foods may sometimes cause elevations, even though you're on a gluten-free diet, and trace exposures or false tests, those are the main things to think about.

Awesome. Okay. Someone wrote, **"Aren't organic pomegranates or beets better than supplements?"**

Pomegranates better than supplements. Yes and no. I mean, if you need to get a concentrated level of them, then you may need to use supplements. Also, if you don't want your entire

hands, face and body to turn red from eating a pomegranate. Sometimes taking a pomegranate extract is a nice alternative. But I understand your concept. I mean, food is better than... Food is food. Food heals. Anytime you can eat a diet rich in flavonoids and real good foods, that would be, of course, ideal. There's just some patients that have such significant inflammation that they're taking sometimes six or seven pomegranate extracts twice a day to calm down their inflammation. I mean, you can't eat pomegranates all day. That's the benefit of extracts and compounds, and what we're trying to modulate the physiological systems.

But, you should be eating the foods too.

Okay, Martha. **What types of glutathione do you consider effective? Except for liposomal, are they best taken on an empty stomach?**

What types of glutathione are most effective? So we know general glutathione supplements that you get, that the ingredient is glutathione, has a really hard time being absorbed in the gut, and it can still be absorbed and it can still have local effects. Like if you take just plain glutathione, so we look at the label, it just says glutathione. That's the only ingredient. That still gets to your gut. And if your goal is to heal a healing gut, those antioxidants reach your gut mucosa and they provide some antioxidants.

If you're trying to raise glutathione levels throughout your system, throughout your whole body, even the basic glutathione has some effects, because glutathione gets broken down into three amino acid peptides, cystine, glutamate, and glutamic acid, and then it can reform into glutathione, but it's just not very efficient. So you do get some effects still with actual glutathione. It's just not the best way.

So you want to take types of glutathione that are best absorbed. So besides liposomal, acetyl glutathione is a good way to have better absorption with glutathione. The liposomal acetyl glutathione is my favorite way to take glutathione. I like to use that. I use a product from Apex Energetics called Trizomal Glutathione, which I think is fantastic. And you can also take N-acetyl cysteine to raise your glutathione.

And there's some really good research with botanicals, like even basic milk thistle and cordyceps that have been shown to raise glutathione levels in cells. So those are all the different ways, most common ways you can raise glutathione levels. Whey has been shown to be as glutathione, but whey is so inflammatory with so many people that I tend to avoid that. But there's some evidence that whey protein can raise glutathione. But you got to be careful with it since it's so inflammatory for so many people.

Okay, last... Tina. **What is the best blood marker for measuring inflammation?**

Tina asks what's the best blood marker for measuring inflammation. So blood markers to measure inflammation are the different types of blood... the different types of markers. The most common one are called the acute phase reactants. And acute phase reactants... the most common is, C-reactive protein is a popular one. And a marker called ferritin that can measure iron storage also is an acute phase reactant. It goes up in inflammation. And interestingly

enough, with the pandemic and people that are getting COVID-19 infection, there was some research published that one of the biomarkers that can be predictive of if a person's going to have severe complications with COVID-19 is if they get hyperferritinemia, which is where their ferritin levels get really, really high, which means their body goes into a significant inflammatory state.

So ferritin and CRP. Now, with subtle degrees of inflammation, you're not going to... You may have people that have pain all over their body. Like, their joints hurt. Their body hurts. They're severely inflamed. You measure CRP and it's normal. You may just measure ferritin, it's normal. Because there are different parts of the inflammatory reaction. So ferritin, for example, activates this specific immune pathway called the Fenton reaction. And that goes up with certain immune responses against a pathogen, but it may not go up with non-pathogenic infections or just various immune responses for different people for different reasons. And then C-reactive protein is a protein that's synthesized in the liver from a combination of different inflammatory cytokines, that they get metabolized to this end protein called C-reactive protein.

But not all inflammatory cytokines get converted to CRP. So CRP can sometimes be very normal with someone who's got severe inflammation, or even severe lupus or autoimmune diseases at times. So there's limitations to all of them. And then you can actually look at the inflammatory messenger proteins, called cytokines, but that gets to be very, very expensive.

And you can also look at something called ESR to look at what's called the sedimentation rate of the inflammatory response. And again, that can be up with simple inflammation, but totally normal with people that have severe inflammation. But if you do have an inflammatory marker like CRP or ESR or ferritin, then that becomes a very good way to have a baseline, and then see if the inflammatory load is coming down. However, if those tests are negative, it doesn't mean it rules out inflammation.

Ferritin functional range, people are asking.

Ferritin functional range. There is no functional range for ferritin. So ferritin, the range is like typically 15 to 450, or 350, depending on the lab you're using. But if it's not below 15, if it's... Ferritin can show up with iron deficiency in early stages, because of iron storage. But if the range is 15 to, let's say 350, 25 is not low ferritin, okay? What's low ferritin is ferritin level of 4, or 3. If ferritin levels are 3 or 4, and you see... that could be a sign that early iron storage levels could be low. What a lot of practitioners do inappropriately is they see a ferritin level of like 25, on a range of 15 and 350 and go, "Well, that's in the low range. That means they need iron." It does not mean that. And if you give someone that has an autoimmune disease or chronic inflammation iron, you can promote their autoimmune inflammatory response.

So I would say for ferritin, just stick with the lab range for the low-end range. If it's not below 15, the lab range, or some labs have 12, then they don't have any concern with iron storage. Now, when ferritin levels go up, like, let's say 350 or 400, that's an inflammatory response. That's called an acute phase reactant response. It doesn't mean they have iron overload. The only way to measure iron overload is to look at your serum iron levels, and what's called iron

saturation levels to determine if they actually have iron overload. So, okay. Thank you all for asking questions. Happy birthday to Stephanie.

Yes.

My sister-in-law.

Happy birthday Steph. She's watching.

Oh, okay. Happy birthday. And then, thank you all for joining us. Sorry for the delays, and sorry for the sound quality. I'm trying to use my phone. And we'll do these again, and thank you all. Appreciate it.

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