Introduction and Summit Welcome

Hello everyone. My name is Doctor Richard Horowitz and I'm the co-host of the Doctor Talk Healing Lyme Summit 2.0. It's my great pleasure today to introduce to you Doctor David.

Joggers. Now, I've been following David for several years because of his amazing newsletters. David and I both share a couple of things in common, which is we both look at inflammation and how inflammation is driving different disease processes in the body.

And David, it's a real pleasure to have you on today. I think people are going to get a lot out of our talk, which today's talk is going to be on Lyme disease and autoimmunity and all of the factors that are driving autoimmune reactions in the body.

So thank you so much for joining us. Well, thank you for having me, Doctor Richard. And I'm glad that you're doing this summit, such important and critical information for people.

Yeah. Well, you know, I was watching your, fasting longevity summit, by the way, and I just bought the protein kit to start my own intermittent fasting.

So, you know, I also got a lot out of it. As I'm getting older, I'm looking at, like, how do I maintain my health? How do I, you know, keep my own longevity?

Because my whole family has died of cancer. They were smokers. They lived in Brooklyn, but they all died of different forms. So, just as you talk a lot about nutrition, you know, in your newsletters and what you do, it's the same thing for me.

If you came to my kitchen and looked at what I swallow every day, I'm swallowing a huge number of nutritional supplements just to stay alive on the planet.

Right? Yeah. I mean, I do the same for me at my age, and I'm in my early 40s. It's about optimal health, right? I want to perform at my highest level, have tons of energy, a great mental clarity.

Be the best husband, father, business owner, sports coach, coach. My son's, and my daughter sports teams. So I want to perform at a high level, and I want to get the most out of every single day.

And I think, you know, most people that are listening this, they would love that as well. Many of them are suffering, unfortunately. They're even even thinking about optimal performance is a big deal.

You know, is is is a big leap for them. Right. But, you know, that's really our goal. The goal for people is to not only get out of, you know, a health crisis, but then ultimately to get to that, that level of optimal health performance.

Yeah. No, I'm 100% in complete agreement. You know, one of the things I learned years ago, apart from getting to the sources of why people are sick, not just like label is disease and throw a drug addict, which is unfortunately what a lot of medicine does.

But getting to the underlying sources. And that's why I'm so happy to speak to you today about autoimmunity, because the vast majority of my Lyme patients have some autoimmune reactions at some point in time, because Lyme causes autoimmunity, environmental toxins.

We see heavy metals and mold all the time, in part driving it. We see leaky gut with microbiome issues, nutritional deficiencies, the wrong types of microbes from sleep disorders, trauma, all of the things that we're going to talk

about today is exactly the rivers of inflammation I find in my patients all day long.

And that's why I think people are going to get out of this talk. So great. So let's just jump in.

David's Health Journey and Nutrition Background

Why don't, first of all, tell people a little bit about yourself. How did you get into, health and, and optimum health to where you are? Because I think it's amazing what you're doing.

And I again, I've been, you know, reading your newsletters actually for the last couple of years. And I think they're very informative and really great for patients.

And at the end, we'll talk a little bit about how patients can learn more about you and, and get those. But how did you get into this yourself for sure.

Well, my mom actually, when I was growing up, my mom was studying to become a midwife. She was a nurse first, and then she became a midwife and then eventually a natural path.

So she was actually studying it. My dad was, you know, it. Health was not an interest of his at all. So it was it was complete opposites. But I was an athlete growing up and my mom would say, you know, you need to eat.

And this was back in the 90s. And so she thought back then, she doesn't teach us now, but she thought the macrobiotic diet was the right diet. Right. And so it was very low fat.

It was, you know, she would she had her own garden, she grow around food. That was a great, great, great benefit of it. But when we got sick, you know, she would make chicken soup, right, or something along those lines.

Lots of garlic, onions, things like that. We use plants as medicine. We never took antibiotics. I was an athlete, so she would say, you need to eat your kale because it's going to help you have more energy. Right?

And I was like, okay, anything that's going to help me perform better. And I would ask her questions. I'm like, what should I eat before before my game? Right?

I would ask questions like that because she taught me what I put in my body affects my performance. And so then later on I got really into fitness, right?

As an athlete. I got into fitness and, you know, 18, 19 years old. I was working out every day. And so I eventually became a personal trainer. I was influenced by other trainers, became a personal trainer, started reading more about nutrition.

Back then I was getting information from Men's Health right, which isn't isn't the best information. But, you know, at least I wasn't eating like just straight junk food all day.

And I ended up developing irritable bowel syndrome. I was eating six meals a day. From the time I woke up to the time I went to bed trying to pack in 5 or 6000 calories a day to maintain a certain muscle mass, a certain physique.

And, eventually that caught up with me and my gut couldn't handle it. And, from there, I started learning other things. In fact, chiropractor at my gym said, hey, you need to check out this book.

It was a book that Doctor Mercola had just put out. It was called the No Grain Diet. Completely changed my my diet and lifestyle. And that significantly helped me sort of getting chiropractic care that helped.

And I ended up going to chiropractic school. And I thought, you know what? I want to teach people nutrition and wellness and, what? Chiropractic school started a clinic out here in the Atlanta, Georgia area.

And, you know, I really although I enjoyed working with patients one on one, I found that I just really enjoyed creating online health content. And so as I as I opened my practice, I started writing articles for other bigger websites. And, I found that a lot of I was saying the same thing to all my different clients that were coming in.

They were saying, you know, what do I do for my thyroid? What are the best foods for my metabolism? What do I do to lower my blood pressure? And so I started writing professional articles on these topics.

And that way I could pass them along to people and they would pass them along to their friends. And I was getting all these referrals because I was writing these articles.

And then I said, you know what? I just need to start really focusing on this. And so, so I hired other doctors and, just went more or less full time into creating online health content, and that really took a life of its own, eventually sold my clinic.

And yeah, that's what I do now, is I just create videos, podcasts, you know, interviews with, with, you know, different health experts like yourself. And, you know, create, create online blog articles.

And, you know, I really enjoy it. I'm able to work from home, be around my family and influence, you know, millions of people all around the world now.

And you can tell you enjoy it because, as I said, I've been reading your articles actually for years, and it's pretty much the reason I thought we'd have a great talk is it's exactly the same things I've been telling my patients for years, but you're explaining it in very down to earth terms where people really get it.

So let's jump in a little bit to the autoimmune right reactions that people get, which is something I'm seeing. And my Lyme patients are dealing with all the time.

Maybe they just start what is autoimmunity? Maybe explain to people in simple terms what exactly it is. Yeah, auto immunity is basically when you have an immune disorder where your immune system actually will attack its own bodily tissues, right.

And so if you have autoimmunity to your thyroid gland. Right. That's, you know, could either you're that you might either put out too much thyroid hormone or too little.

We call it Hashimoto's thyroiditis. That's, autoimmune hypothyroidism and then autoimmune hypothyroidism is graves disease if you have autoimmunity to connective tissue and joints, depending on the features of that, it could be rheumatoid arthritis, right.

Or lupus or something along those lines. So there's all these different autoimmune conditions. I believe there's over 100 autoimmune conditions. You could basically develop autoimmunity to any major protein in your body.

And this is a sign that your immune system, in a sense, the way I think about it is it's kind of like if there was an alarm that went off in your city and all the police came out with their guns, but they were blindfolded.

And so there's an alarm. They know there's bad guys out there, and they but they just start shooting because they can't see anything. And that's basically what's happening in your body.

Your immune system is doing everything it can to protect you from a systemic infection. In fact, we know that infections actually killed more of our ancestors than anything else.

The reason why was our ancestors, if they got a flesh wound, they, you know, they didn't know how to sterilize it. Right? And so what happened was, you know, they got a flesh wound.

A lot of times bacteria will get in into the bloodstream and it would spread into their lungs. Cause might cause pneumonia or into their nervous system and cause meningitis or encephalitis or something like that.

And that's why people would die. And so because of that, the immune system understands that high infectious load and a high infectious load in the bloodstream is life threatening.

So it has to do everything it can to make sure that that doesn't happen, because our body, of course, it's built for survival. And so we'll live with chronic low grade inflammation for a long time or autoimmunity like you can live 20, 30, 40, 50 years with autoimmunity.

You just don't live well. And so our body will sacrifice living well to live. Right. It's a good payoff, right? From that perspective, what we gotta do is figure out what is causing all this high, pathogenic load.

Right? And toxins from seeping into the bloodstream, driving up, this, this sort of autoimmune or chronic inflammatory response. That's what we have to do and shut off that valve.

Right? So that way we can lower the overall what we call allostatic, load the overall pathogenic load, or disease causing load in our system and return our body back to homeostasis and overall balance.

What Autoimmunity Is and Why It Happens

Yeah. And, you know, for those who are listening and you know, we we're going to be having thousands and thousands of Lyme patients listening to these podcasts.

We find in our patients these autoimmune markers all the time. For example, we're finding anti-nuclear antibodies. But it doesn't mean you have lupus, right.

We need a double strand of DNA or a Smith antigen to say it rheumatoid arthritis. You brought it up. We see rheumatoid factors in a lot of our chronic Lyme patients.

But you need a CCP, a cyclic sick related peptide, to say it's true rheumatoid arthritis. Right. So what we see in our patients anti side right. Antibodies. Right.

Most of our patients there's probably the number one autoimmune marker we see is actually anti thyroid globulin anti peroxidase. You know Lyme patients because as you said when you've got Borrelia Bergdorf right.

And we've got Bartonella and we've got mold toxins and heavy metals and leaky gut microbiome. It starts attacking all of these proteins and, and different you know, cells in the body and organs.

So we'll see anti ganglia side antibodies with neuropathy. We'll see antiviral antibodies. But it doesn't mean necessarily right that they have a true autoimmune condition.

It's an autoimmune reaction and people need to differentiate it. But interestingly enough we've been able in some of our cases we've reversed, you know, Crohn's and ulcerative colitis, by getting people on healthy diets, getting them off glyphosate and the wrong types of food, giving them the right type of microbiome, healing the leaky gut, which is crucial.

We're going to talk about that. So, yeah, it's a fascinating thing because a lot of people get these autoimmune reactions from Lyme and Barton mold doesn't mean you're going to develop one of the really serious diseases.

But it's saying as you said, there's an inflammatory response in the body and ultimately inflammation, as you know, because you talk about it in the newsletters.

I talk about, it's the number one cause of all chronic disease, right? It's it's some form of an inflammatory response. So for sure inflammation I think about it like like a fire in a fireplace.

Right. So winter time right now, you know, we have we have a fireplace when the fire is burning in the fireplace. It's great. It brings warmth, you know, creates a nurturing environment.

But if I were to take gasoline and throw it on that fireplace, right. With the fire burning, now it's going to start to burn down my house. And obviously, that's a problem.

And that's what most people are doing. We all have some level of low grade inflammation is part of the natural healing response. Right. But our lifestyle can be like throwing gasoline on that fire.

And now a search burning down the house starts burning down the walls. And then we wonder why we're not feeling well. And so we've got to do is stop throwing the gasoline on the fire.

Yeah. So, you talk about in a newsletter and by the way, at the end of this, we'll make sure people have links so they know how to get there. You're really great newsletters.

One of the things that was really interesting is I talk about mitochondrial dysfunction as part of the 16 point episodes model I use, and I do talk about cell danger response.

But what I don't think most people know about is there's a relationship between the cell danger response. Right. And this autoimmunity. Maybe explain to people a little bit about how that happens.

Well for sure. Well, you know, we've we've all been taught especially, you know, in medical school and most people have been taught at some point that are listening, have been taught that the mitochondria are what produce the energy within the cells.

So for us to produce cellular energy, ATP, the mitochondria will take carbohydrates, I'll take glucose, I'll take, fatty acids and that will produce cellular energy.

And so, so basically this is what we're taught. But really the mitochondria are much more complex than that. They're kind of like the nervous system of the cell.

So they are constantly adapting their energy production and the amount of oxidative stress that's produced within them based around what's happening in the environment.

And so when they sense that there's a peace time, environment, right. When all of our potential overloads of stress. Right, pathogens, toxins, our mental, emotional stressors, physical stressors, all of those things are under control.

They're going to produce a lot of energy and just a small amount of oxidative stress. However, when our load of pathogens infectious load goes up, the amount of toxins that we're being exposed to goes up.

We're we're dealing with a lot of mental, emotional stressors, PTSD, lots of different factors like that. Or could be physical stress, like a concussion or something along those lines.

When those things happen and they build up and go beyond a certain threshold, now the mitochondria say, okay, we're in a war time physiology. They actually lower energy production and they increase the amount of oxidative stress.

And oxidative stress is like internal rusting. And it's the precursor to inflammation. Inflammation comes out to help clean up the oxidative stress. And so they're actually turning up inflammation throughout the body.

Now every single person that's listening to this has exposed this cell danger response very quickly. At some point in their life, for example, we've all gotten the flu.

And what happens, right? I actually got this in, a few months ago, I felt great. It was a Tuesday night. I felt great, felt awesome. Went to bed, woke up somewhere in the middle of the night.

I was like, oh, that's weird. I woke up, you know, and I just couldn't. I had trouble falling back asleep. And I got up the next day and I just didn't feel my best.

And as the day went on, my energy was going down further and further and further. So I went from a ten out of ten energy level to maybe like a two out of ten, where I was just completely sapped.

Right. And it was like that for like 2 or 3 days. And that was my body saying, okay, my viral load was so high, right, that we need to shut down energy production.

We're in a wartime physiology right now, and this is part of the internal detoxification system that my body need to undergo. We turned up oxidative stress, turned up inflammation.

My body needed to rest, right? I needed to rest, relax, do things to help support recovery. And then, you know, I would say a week later I was ten out of ten with my energy levels. Right.

Within three days, you know, I went for maybe a two out of ten, a five out of ten, six out of ten. Every day I would go up a little bit more. You know, after a week, I was a ten out of ten.

I was completely out of that. So danger response. I completed the healing cycle. Problem is that for many people, they get hit, whether it's a flu or maybe they eat something, you know, with a high bacterial load on it and they get salmonella or, you know, they get bit by a tick there and now they get exposed to Borrelia or some sort of, you know, co-infection.

Their body oftentimes undergoes this kind of initial acute response. Right? And they start to almost complete the healing cycle, but they never really do.

And then they never they kind of plateau in their healing process. And they never get better. Right. And over time, actually, they get oftentimes get worse.

With each passing month that goes by when they're not completing that healing cycle. And this is what many people do when their mitochondria are stuck in this cell, danger response, not producing optimal cellular energy and producing lots of oxidative stress, triggering inflammation and triggering, change in the entire function and structure of the immune system to where now they're they're putting out lots and lots of antibodies to different, you know, proteins and, that are in the body and ultimately down the road, after many years, oftentimes many years of this will be diagnosed with autoimmune condition.

And, you know, the cell danger response is something that is a real problem in our patients when they still have loads of toxins and infections that have not been cleared.

Well, you know, when I heard Bob Navajo talk about this health danger response years ago, he was talking about the need for extracellular ATP, right, to kind of get out of this cycle.

And he was talking about sermon, you know, this because I'm sure you've you've listened to Bob before, for sleeping sickness, which you can't even get the drug here.

And we have played around over the years with things like really high dose broccoli, seed extract, sulforaphane, glucosinolates.

Cell Danger Response and Mitochondrial Dysfunction

Hopkins talked about it in the autistic population because Bob was saying, hey, if you get that extra ATP going on for the cell danger, these kids, for example, with autism will get better.

And it was truly amazing. So we've tried it, but we've noticed that in our patient population, until we've used things like short term daps on combination therapy, or hit Bartonella or treated Berbizier or removed enough to the more toxins or treated the leaky gut, they won't get out of that, you know, sickness cycle to move exactly to what you were talking about with the healing cycle.

So you're right. I mean, this is it explains in part why some of our patients stay stuck. The load of the bacteria, the load of the toxins, the healing of the gut, the trauma.

I mean, I affectionately call my patients the walking wounded. Just because so many come in with trauma right over time that, it's important for people to understand this.

That was so that's a great explanation. So let's dive into the the seven major factors driving autoimmunity. Let's talk about infections. By the way, one quick thing about, flu.

And I'll just mention this. It's kind of an offshoot. When I published the first article in the world literature on Covid 19 using glutathione. And this was in April 2020, and this is before anybody really knew much about the virus we had seen in our Lyme patients when we gave them high dose glutathione, like they would come in with the BCA, they'd have a lot of cytokines and chemokines.

We give them glutathione and they're shortness of breath and everything would get better. So we published that. We found it was working for Covid and interestingly enough, in the flu, in dengue fever, in HIV, in most of these viral infections, they need to lower glutathione to be able to replicate.

So what I do with my patients when they get sick that way, apart from saying, here's Tamiflu, here's a five day course for the flu, I actually tell them to use any C and glutathione on and things to up that because every virus so far I've looked at has to lower it to to replicate.

And that will affect obviously cell danger response and everything else going on. But I just just a side point with that because I just recently also my wife had gotten sick with the flu a while back also same thing and also took a few days to pull out.

But the glutathione was just very helpful. So talk and talk to me about infections. We know Lyme disease will drive autoimmunity, but Bartonella will do it.

The process that's going on. Let's talk a little bit about it. Yeah for sure. Well you know obviously we can get infections from a bite from a tick bite a spider bite from a, from some sort of a wound.

Right. And we've all kind of, you know, that's why we if you get a wound right, what do you typically do. Put hydrogen peroxide on it or something like that to make sure that we don't have a high amount of infectious bacteria getting into our bloodstream, propagating and spreading out tons and tons of toxins that drive up inflammation in the body and cause major issues.

And so we understand that it can come from the external. But, you know, I would say where infections typically are causing obviously with Lyme, it's it's oftentimes a bite.

But we have to look at the intestines as well. So in our gut our intestinal lining is basically like the gut is like a long tube that's separating our bloodstream from the outside environment.

And so everything that's going through there is there's a protective barrier trying to protect what actually gets into the bloodstream and what stays in the gut and moves out through our feces.

And so the intestinal lining, though, is particularly in the small intestine, is only one cell wall thick. And that's because our ancestors had food scarcity at times.

And so they had a lot of times where there wasn't a whole lot of food available. So when they got when they had access to food, they needed easy nutrient delivery.

And so only passing through one cell wall allows for easy nutrient delivery. In our society today we have an abundance of food, so we all have pantries full of food.

It's pretty easy to access food in a in a first world country. And so we don't deal with that anymore. In fact, what we're dealing with now is high amounts of of infections and toxins coming in from our food supply, causing inflammation in the gut, degrading the mucus mucosal barrier.

And so along the one cell in our intestines we have mucus mucous membrane. And that's really where the the immune component of our gut lives is called.

Secretary IGA. And in order to have a healthy gut we need a really healthy mucus lining. And so the food that we're consuming, oftentimes we are causing inflammation in that and degrading that mucous membrane and damaging the actual gut lining, allowing for large proteins as well as bacteria and different pathogens and the toxins they produce, the endotoxins to actually get into the bloodstream, driving up inflammation throughout our body.

And so those infectious microbes, when kept under control, are fine. But when they get into the bloodstream, they start propagating, and releasing their toxins.

That's driving up inflammation in the body. And a lot of people are dealing with this. Yeah. You know interesting. My my story with it is I had allergies and asthma growing up.

But of course, nobody in med school taught me about leaky gut. And as I started testing my patients, we found, like, the vast majority at this point. Right. We'll send them to LabCorp.

They won't do it in New York with an IG for food panel, but they'll get a 95 IgG for food panel. And I'm seeing wheat and dairy and shellfish and eggs.

And I mean things you would never expect that people would be allergic to. And it's not the IgG anaphylactic. Right. It's these yeah great inflammatory.

But my allergies and asthma every time I eat dairy you know I get a pizza or whatever I would start to get mucus. I would start to get wheezing and tightness.

Once I found out I had leaky gut. And I used bovine immunoglobulins like Mega IG, mega spore and got the right probiotics. Now, I don't have the same reactions.

My asthma. I haven't had to use an asthma spray now in an extremely long time. So so you're right. I mean, those endotoxins and things going on in the gut or or problem and and even so, and you mentioned this in your newsletters, even if you're eating wheat and some of the things you think are healthy, the problem is the glyphosate. Right?

So, you know, you you don't have to have the same deal. Yeah, it's a big deal. Glyphosate is going to poison the mitochondria within the intestine. It's also going to damage the microbiome, but it poisons the mitochondria within the intestines.

And our intestines need to be basically the best bacteria so that the keystone bacteria. And for there to be microbiome researchers, when they look at the microbiome, they want to see that there's a high level of diversity in the microbiome.

And the best short chain fatty acid producers, which are basically short chain fatty acids, are what really help feed and strengthen the mitochondria within the intestine so that they're stress resilient and they keep that intestinal barrier functioning well.

And that our goblet cells are producing the right amount of mucus. We need these short chain fatty acids, particularly butyric acid, probably most well-studied of them.

Infections, Lyme, and Gut-Driven Autoimmunity

And so the types of bacteria that eat fiber and polyphenols and produce butyric acid and produce things like your olefin A that really strengthen the mitochondria, they are what we call obligate anaerobes, meaning that they really they, they are not able to survive in a oxygen based environment, whereas the more pathogenic histamine producing bacteria and microbes in general, the more pathogenic microbes they are either, facultative anaerobes, meaning that they can survive with oxygen or without or they're aerobic all to begin with.

Right? Meaning that they really like oxygen. And so the mitochondria, when they're functioning well, they're able to produce a lot. They're able to take oxygen out of the intestinal environment and produce cellular energy through oxidative phosphorylation and produce high amounts of cellular energy and bring the oxygen content down in the intestines, which means these more pathogenic strains, they're going to die down in the obligate anaerobes that produce the butyric acid are going to rise, and we get this natural diversity that takes place.

And our gut microbiome is really good at producing these, short chain fatty acids that strengthen the mitochondria. And so this is kind of the cycle that keeps the mitochondria healthy.

But if we're eating, you know, if we have a bad diet, if we're taking in a lot of toxins like glyphosate, which is the most ubiquitous toxin that we're all being exposed to at some point, going going organic, eating organic foods really helps reduce glyphosate load and of course, not spraying your yard and things like that, will help reduce your load, but we're still being exposed at some level.

But keeping it up, keeping that exposure down is so critical. And then of course, eating the right foods, so critical for allowing the mitochondria within the intestinal cells to function well.

And when those mitochondria are functioning well, it's they're they themselves by pulling the oxygen out will help regulate that microbiome and create very stress resilient tight junctions in the small intestine.

So, keeping that barrier intact and preventing against leaky gut. And the reason this is so important is because they've now shown clearly that certain bacteria are responsible for autoimmunity, right?

They found it with rheumatoid arthritis. They found it with Alzheimer's, with Ms.. I mean, what we do personally, I take a whole bunch of different probiotics, but mostly for the short chain fatty acids.

You know, I'll have an organic teaspoon of organic flaxseed, a teaspoon of organic black seed, teaspoon of organic hemp seed right in my yogurt in the morning.

Apart from probiotics with Bifidobacterium and the rest. And you're right, I mean, as a species, if pregnancy or the really beneficial bacteria, it's stopping disease.

But if you get too much clostridium, too much of the wrong type, it's now absolute association with autoimmunity. So you're right, I mean keeping down the sugar I mean we it's probably a good segue to talk about this.

You also talk about insulin resistance and sugar in your, your diet, with the autoimmunity. It's also one of those things going to help to keep down that, that inflammatory process.

So I've been a little bit explain because obviously insulin resistance is napping, whether it's nonalcoholic fatty liver disease or Alzheimer's or you know, diabetes that's showing up really kind of all over the place.

Explained a little bit about how this relates to autoimmunity and why people need to be so careful with their simple carbohydrates. For sure. Well, blood sugar, sugar in general are basically any sort of carbohydrate other than fiber.

So starch and sugar, our body turns that into glucose. And we can measure that on your blood glucose levels. And you have to you're always going to have some level of blood glucose, because there are cells in your body that can only run on glucose, right?

In fact, the brain cells need a certain supply of of glucose. They can also run off of something called ketones. And

we can come back to that. But we always have to have some level of blood glucose.

But we need it in this tight range. And when blood glucose goes too high, like, for example, somebody that has, somebody that's diabetic, right. What happens?

The glucose molecules will actually bind to proteins in the body and create a sticky protein. We also call these advanced glycation end products AG. These these eggs are like shrapnel going through the bloodstream.

These sticky proteins drive up inflammation in the body, particularly in the endothelial lining of the blood vessels, and they damage the blood vessels.

And so when you think about somebody that has uncontrolled diabetes, where their blood sugar has been really high for a long period of time, what happens?

They develop peripheral neuropathy where they've damaged their nerves and they can't even feel their feet. Sometimes optic neuritis, they lose their vision.

They typically they're dying from heart disease. Right. Because the blood vessels have been so damaged or kidney disease, right, where they're, you know, oftentimes, you know, their kidneys shut down, they need dialysis, right?

They have fatty liver disease. And so basically it's damaging all these major organ systems. And so insulin is this superhero hormone. Its job is to take sugar out of the bloodstream and put it into the cells, can now be used to produce energy and also pulls out other other key compounds like like magnesium.

It helps shuttle magnesium into the cells for for energy production and and for utilization. And so we really need good we need insulin production, but we need our cells to be very responsive to insulin.

And so what happens every time we eat we're producing some level of insulin. And the more there are certain foods that are more in slow genic meaning when we eat certain foods, particularly ultra processed foods, your candy chips, you know, all the middle sections of the, the grocery store, those are the are highly in slow genic.

So when we eat those, we produce high amounts of insulin when we eat real foods. Right. If we eat, you know, a, you know, a, let's say a cucumber, right?

Or, a big salad or a steak or, even just, you know, potatoes or something like that. We're not going to produce a ton of insulin because these are whole real foods.

They've got natural fibers, natural protein, things like that. They're less insulin genic. Okay. So we are going to produce insulin. We're not going to produce a whole lot, whole lot of it.

And so that's why a real food diet is so critical here when we're eating the ultra processed foods, things with added sugar, added starch in them, we're producing high amounts of insulin.

When we produce high amounts of insulin, our cells stop, responding well to the insulin. We stop getting a lot of sugar getting into the cells. And that's because the more sugar we're driving into the cells, more oxidative stress goes up in those cells, the more internal rusting process takes place.

Also, when insulin gets elevated beyond a certain threshold in the blood, it stops natural cellular healing processes. It drives up cell reproduction without so without good cellular healing.

When insulin goes down, like for example, every night we should be fasting overnight. We should, you know, we stop eating at a certain time and we shouldn't eat.

You know, until, you know, later, you know, let's say, you know, mid-morning or, later in the day, and insulin will go down beyond a certain threshold.

And when it does that, the body actually triggers natural self-healing processes. We call this autophagy, where the cells will actually break down old damaged mitochondria or damaged proteins and actually recycle them, take the raw materials and produce new, healthy, more stress resilient mitochondria, new, healthy, more stress resilient, cellular organelles and that allows a cell to function better.

This is normal. This is what should happen. But when insulin is elevated in our blood, like most people in our society are walking around with, we don't burn fat for fuel and we don't undergo autophagy effectively to repair the cellular organelles.

And so now we're not in a state where we're not healing, right. We're not internally healing, and we actually start storing fat. As long as insulin is elevated, we can't burn fat for fuel.

We get stuck in this kind of chronic sugar burning mode, and we're producing high amounts of oxidative stress, damaging all the cellular mechanics. And, you know, again, we can't burn fat for fuel.

Fat is where we store toxins. It's an energy storage that we all have right. But we want to be great fat burners. We want to be burning through fat, as our primary energy source for most of the day, particularly while we're sleeping at night.

And that's super critical for a healthy metabolism. It's also critical for detoxification and for keeping inflammation under control.

Blood Sugar, Insulin Resistance, and Diet

The more these fat cells start to grow, or the more we're feeding the fat cells, and in particular, we start developing visceral fat, which is this type of fat that surrounds the organ systems.

And we used to think fat was just a storage form of energy. And that is an important component of fat. But fat is also an endocrine organ, meaning that it will actually release cytokines, cytokines. Right.

And it's in a sense part of the immune system. It's actually releasing compounds that, that drive up inflammation in the body and also reduces oxygen delivery to major systems of the body, like when we develop fatty liver.

That's not just fat on the liver, it's actually liver cells that are becoming damaged because they can't produce they're undergoing high amounts of oxidative stress.

And so we're actually getting damaged liver cells. And so now the liver is not able to do what it needs to do filtering, detoxifying the blood, creating key proteins.

All the different things that it needs to do. And we've got excess fat building up around it. Which is going to create a vicious of a, a, vicious cycle.

Right. Where it's going to further reduce oxygen and nutrient delivery to the liver cells. So this is a significant issue. We need a tight zone for blood sugar.

So we want to be eating foods. Right? I always recommend eating 2 to 3 meals a day. High protein. Right. Lots of colorful fruits and vegetables, some healthy fats.

That's what you want to do. That's going to create blood sugar. Stability. Do everything you can to reduce the ultra processed foods. Right. And really stick with whole foods.

And, and this for you for like you hear people talk about the autoimmune diet. So what you really talking about is the Mediterranean diet has basically been holding up at this point is one of the healthier diets.

And because probably at least half of my patients have reactive hypoglycemia, where, you know, mid-morning, all

of a sudden they start yawning, they get tired, they get hangry, right?

The emotions start doing or mid-afternoon. That goes along with sometimes their adrenal dysfunction. And of course, that's associated with high insulin secretion.

So the diet you're talking about is like 40% good quality protein, 30%, you know, complex carbohydrates, 30% healthy fats. Is it mostly like organic olive oil, avocados you're using and whole grains, are those the one you're recommending to your patients?

Yeah, absolutely. A high polyphenol extra virgin olive oil. One of the best things you could possibly put in your body. So powerful for reducing inflammation in your body with your meat.

You know, I always say there's a couple changes with your nutrition. Number one is you want to reduce your consumption of, you know, processed foods like I talked about and seed oils.

Right. That's number two. So anything with corn, soybeans, safflower, cotton seed, peanut oil, all of those types of canola oil, all those types of processed seed oils.

You want to avoid the fruit oils like avocado right. Or avocado oil and extra virgin olive oil or olives in general. Very good, very healthy. They're lower in inflammatory omega six, fats high in Anti-Flag dietary mono unsaturated fats, also high in polyphenol antioxidants.

And so their olive oil, for example, is high oxidative stability. It's really, really good in the body. Lots of lots of antioxidants. So that's really, really good.

And then with the meat you want to make sure you get going organic, grass fed, pasture raised, wild caught because you want to do everything you can to reduce chemicals and toxins.

And so when we're eating, you know, your typical grain fed, conventionally raised animal products, they're feeding them grains, which skews their fatty acid ratio.

And then on top of that, those grains are covered with glyphosate and other chemicals. And so they're bio accumulating that inside of their body. So they're dairy products.

They're eggs. They're you know, their meat is going to be full of that stuff. And so to, to reduce your chemical load, you want to go as organic as possible, especially with meat products.

Now when it comes to produce, ideally you're going organic, but there is, the clean 15 and dirty dozen. So the general rule is if a, you know, if you're going to eat the outer layer of something, you really should go organic, like a blueberry, for example, you're going to eat the whole berry, right?

You're not going to peel the outer layer. You definitely want to go organic. It's easy for pests to eat to to to bite into a blueberry as well. So they use more pesticides, more herbicides on that.

Whereas something like garlic, for example, or a banana or avocado, you're going to peel that outer layer right and eat the inner layer. It's harder for pests.

They have a hard skin that makes it harder for pests to get in and penetrate. So there's going to be lower amounts of chemicals on the, conventionally grown avocados or banana or garlic.

And so those would be the ones that would be okay to get non-organic. Although if you do have the option, and it's somewhere close, you know, in price point, it's always best to go organic, you know.

And in fact, that's pretty much how I eat. I mean, we have organic blueberries, organic raspberries, organic strawberries are almost every morning, right.

The polyphenols, those are just shown to have such great health benefits. You know the problem of course, though, with even the Mediterranean diet with fish, because they talk about omega three is anti-inflammatory too much omega six inflammatory.

You were talking about it is I've had to really cut back on my fish consumption, because when I checked my heavy metals for mercury years ago, it was off.

So I was eating fish probably 5 or 6 times a week because I love it, right? But now it's not even the metals, it's the nano plastics and the microplastics that are getting in.

And it's a real problem. So I think it's a good segue talking about autoimmunity. Let's talk a little bit about the toxins because we're we're finding heavy metals.

I'll do it in the serum, but I'll do a six hour urine DMZ challenge occasionally. Hair analysis. We're finding it in the vast majority, whether it's low level, sometimes high and mole toxins.

I'm finding all five mold toxins with aflatoxin citric thickens and sealer unknown and all the rest and glial toxins immunosuppressive in 80 to 90% of all the patients I am now testing.

So, what are you doing for these patients? I mean, we have specific protocols. We're using phosphor that'll choline push it out of the cell membranes, bind with glue to iron with charcoal, clay, use a little bit of, glucose in to bind.

Try Co thickens the right type of Saccharomyces. You know we have protocols we give. But it's a real problem with autoimmunity and the fact that it's affecting the cell danger response. Right.

It's affecting your immune system. It gives you the same symptoms in fact, as Lyme. And we have found probably at least 25% of our patients, we detox them and some of the symptoms they thought were due to Lyme or tick-borne was actually due to the toxins where the mold and the metals.

You're finding the same thing in a lot of your patients when you're you're asking them. 100%. I you know, I think that's one of the big differences, you know, in in helping people get well today than it was, you know, maybe 20 or 30 years ago is the amount the overall toxic load is much higher.

We're all being exposed to toxins. And some people have a stronger reaction to toxins than other people. And so, so some of it's individual istic, but in general, everything we can do to avoid toxin exposure is going to be critical, right?

So, you know, if you know, there's mold in your house, get out of the house, test your house every, you know, every year, we even pro prophylactically we dry fog our house.

Right. So we'll get that done, like once a year, which, is good for cleaning any sort of potential mycotoxins that are in the place. Now, if there's still, like, an active water leak or something like that, it's just going to come back. Right.

But, but there is, a technology called dry fogging. And there's companies trying to think of the name of the company that we use, pure maintenance. I believe it's called pure maintenance.

If you go to their website where they use, you know, all natural ingredients, you go out of your house for about a half a day and they just dry fog it.

You come back in later and you just you feel a lot better, right. So that's where they can just focus on a room. Right. Depending on, you know, what you want to focus on. You.

And so that's really helpful. Do you know what they're using for it. Because I mean, in the past I've heard people like, take a little bit of ammonia, something, close the door, try and get the mold spores done with it. I this that's.

A good question. I have to look at that again. I'm not exactly sure. I think they've got, like a grapefruit seed extract or, you know, some sort of like a proprietary formula.

But I think that they tell you like an ingredient or two that they've got in there. But, but with that said, you know, that that is a strategy getting air purifiers in your home.

Obviously a really good idea as well. So you want to clean up as much as possible, the air you breathe, the water you drink, and the food that you're consuming and the things you're putting on your skin.

So having an air purifier going outside, right, particularly if you live in more of kind of a rural area, you know, the solution to, to pollution is dilution, right?

So getting outside, typically, unless you're in a very strong industrial area, you're going to have cleaner air there where you can breathe. And if you are in an industrial area on the weekends or wherever you have opportunity, go drive to the mountains, right, go drive to the beach.

Go drive to an area where you know you can get more in nature. Go out in the woods, you know, get forest bathed. They call it right in Japan, right? It's actually a really great, thing for your mental emotional health, right?

Actually connects you to to nature better. It's great for the for pulling you out of a cell. Danger response or getting out in nature, I think, is really key.

Getting good water, water purification is really important as well.

Toxins, Mold, Heavy Metals, and Nutrient Deficiencies

So a good reverse osmosis water system or distilled water, is, is really good. And then making sure of course, we talked about organic foods, trying to eat, you know, a pure healthy diet as much as possible, and you got to poop your way to good health, right?

So drinking a lot of water, right, will help you do that. It's going to help dilute things and move things through your body. You want you want things moving through like a river, not stagnant like a pond.

And most people are chronically dehydrated. They're not drinking enough water. Hydrating well is key. In fact, you know, back when I was working with patients full time, it was like every single day I'd hear people say, you know, you know what, doctor?

I feel so much better, but I gotta pee like, every 45 minutes or an hour. And I'm like, that's good. Like, that's that's helping you get better, right?

You should be moving your bowels two to sometimes three times a day. Right. Moving your bowels at least once a day, 2 to 3 times a day. Basically, if you're eating three meals a day, you might poop two big ones or three right a day.

Right? To get all the waste products out of there. You need to be peeing right on a regular basis throughout the day. You should be peeing every 1 to 2 hours, right?

Obviously we don't want to do that at night. So you start stop drinking as much in the evening. But in the morning, I super hydrate my body. I make sure I'm very well hydrated early in the day.

It's actually going to help your cellular energy and help your body detoxify. So gotta pee and poop your way to good health. And of course, make sure that any sort of skin products you're using are as nontoxic as possible.

So whether it's, you know, skincare lotions or things like that make up, there's more varieties now of natural, low chemical or chemical free products now than ever before.

Right. So there's almost everything can be mimicked now in a, in a much safer, natural way. You are going to pay a little bit more, but it's certainly worth it when it comes to your overall health.

So reducing your toxic load is super critical here. And you know, when speaking about nutrition that we find in our patients, when we do nutritional profiles, serum, magnesium, RBC magnesium, serum copper RBC copper, serum zinc, RBC zinc, iodine.

At least 18 to 20% of our patients are showing deficiency. So the problem is, even when you're trying to get in a great diet, like eating the kind of Mediterranean diet we were discussing, the problem is, is because they haven't turned over the soil and we've not been taking care of the land properly. Right.

I have to use a multi mineral supplement. I take, you know, metrics from Xamarin to make sure I'm getting enough mag because you need magnesium for 300 detox ification enzymes.

You need copper for superoxide dismutase to handle the free radicals. You need zinc for, your immune system to function properly. Keeping that is key for us as well.

Yeah. So, so, you know, we recommend I do have my my wife does it, I take it, and I recommend, supplements. And I know you have bundles you put together for people because otherwise, like me, they're they're swallowing 70 pills a day.

You've made it kind of easy for people. And we'll get to this in just a second of how they can, look at some of those bundles that you put together for people.

But but it's really key because talking about immunity. Yes. The infections do it. Yes. The toxins will drive it. Leaky gut will do it. The wrong type of microbiome will do it.

Nutritional deficiencies will do it right. Whether it's vitamin D, right. I take K to D3 every day because I can't get out enough, and sleep. Right. You you also talk about sleep and circadian rhythm.

Right. Being an issue and and like patients don't sleep. They have a circadian rhythm disorder called DSPs the late sleep phase syndrome. Maybe talk a little bit about that and what you do with these people and why it's also important for autoimmunity.

Yeah. Sleep is so critical. Right. So basically our master hormone melatonin. So when we're sleeping at night right. Let's say as, as the sun goes down at night and it gets dark and our ancestors would have gone to bed shortly after that if they were exposed to any light. It was fire.

And that which is more of like an orange reddish light. And that kind of light doesn't block melatonin levels, whereas the light we're exposed to in our homes or, you know, if you're working, it's this blue light, very bright blue light.

And that blue light inhibits melatonin production. Normally at night as the sun goes down, melatonin rises. Melatonin is our number one endogenous mitochondrial antioxidant, right.

So we know it as a sleep hormone. But it's an incredible antioxidant within the mitochondria can slip in and out of the double membrane of the mitochondria and really help clean it up and help, help basically pull us out of a cell danger response and help protect the mitochondria from oxidative stress.

So melatonin is key. And then also we get this rise of human growth hormone. And growth hormone is this superhero hormone that tells us to burn fat, preserve lean body tissue, helps balance the immune system, helps improve our skin hair, nails.

Right. They call it the anti-aging hormone. Because it has all these anti-aging, natural healing, mechanisms. However, when we're exposed to blue light at night.

So let's say we're on devices or we're just in front of lights, that is going to lower our melatonin production and growth hormone production. And so then later, you know, we finally fall asleep and we go to sleep, but we're not producing the melatonin and the growth hormone that we need to really heal and regenerate. Well.

And then oftentimes, you know, most people are not going outside much during the day. So we actually set our natural circadian rhythm when we go outside, particularly getting outside, getting some sun exposure early in the day.

We know infrared, which is actually part of the sun exposure, the sun that we don't see, it's non-visible light. But infrared actually stimulates mitochondrial melatonin production, right, to help clean up the mitochondria.

So we're out in nature. When we're out in the sun. We are getting this infrared exposure all throughout the day. And that's setting that circadian rhythm.

In fact, early in the day when you get out and get sun exposure, that tells the, that tells the circadian rhythm. Yeah. You have your brain's circadian rhythm, and you have your peripheral circadian rhythm within all the cells in the body that it's daytime.

And let's produce energy. Let's produce lots of cellular energy. And we know that, you know, within 12 hours or so, we're going to start to get ready for sleep.

So it actually tells the body when it helps set a timer so your body can wind down later in the day. And you can get the right hormone secretion for optimal recovery.

If you're just sleeping random times and you're exposed to blue light and then you go to bed, you weren't you are sacrificing the amount of melatonin and growth hormone that you're going to get.

And so your body is aging faster than it should if you have proper melatonin, a growth hormone. And of course, you're going to feel it, you know, you're going to have less mental energy, less energy in general.

Your immune system's not going to function well because you're not healing and regenerating the way you should be each night while you sleep. So circadian rhythms super critical. Yeah.

And you know, the thing that's really fascinating about melatonin, even small doses, is when we're looking to block some of these inflammatory pathways that are leading to chronic disease melatonin effects.

And I know you know this, but I'll tell it for the people listening. It affects a pathway called NLRB three inflammasome, which has now been associated with Parkinson's and Alzheimer's and and Covid.

So when we were creating initially our Covid protocol, we were always using small doses of, melatonin. Apart from using vitamin D and any C alpha lipoic acid, glutathione shown to block NF kappa B tumeric, broccoli seed extract, resveratrol.

And for stimulating the NRF two receptors but also using low dose melatonin. All right. And so all the things we're talking about that, you know, lower inflammation.

So yeah, it's even more that's. Actually also one of the great benefits of infrared sauna. So not only do you get infrared exposure from the sun, which is, you know, the way that our ancestors all got it from.

But now you can actually also use technology to get this infrared exposure. So I actually have an infrared office chair. Right. So I have an office chair that puts out PMF and infrared.

Sleep, Circadian Rhythm, and Trauma Recovery

Right. So right now I'm standing. But when I'm sitting I turn that on. So I'm getting some level of infrared exposure

there. You can get an infrared sauna.

So you're taking off you know your clothes right. You're getting the infrared sauna. So it's getting right into the skin cells, you know, and right it and infrared penetrates deep into the body and it's stimulating that mitochondrial melatonin.

And so you're getting that breakdown of Nlrp3 right. The inflammasome. So you're shutting down these inflammatory vicious cycles of inflammation in your system when you're exposed to that.

So it's a great healing technology getting that regular infrared exposure. Yeah we have one in our basement. And we just got a place a small place in Saratoga.

We put an infrared sauna. That was one of the first things we did. I mean, apart from detoxing, you're getting all these chemicals out of your body, right? You're right.

I mean, for mitochondrial regeneration, even healing in part, you know, the rest of the body, even the autonomic system. Yeah. And if you're in a region of the world where, you know, you can't get a whole lot of sun exposure, you're in a northern climate or something like that.

During the wintertime, you're not able to get much sun exposure kept in that infrared sauna. Don't just take vitamin D, vitamin D, definitely take it.

So you can optimize your vitamin D levels, but you're not getting the benefits of the infrared. So getting an infrared sauna or have an infrared blanket, I mean, there's there's low cost infrared sauna blankets too.

So if you don't have room in your house for an infrared sauna, which I totally understand, it takes up space. It's expensive. You can get an infrared sauna blanket for a fraction of the cost.

That's portable. Right? And you can just kind of fold it up, put it in, in the corner. So you're getting that you can kind of wrap yourself in that heats up super quickly.

Do that for 20 or 30 minutes or whatever, right. Every day or as often as you can. And that would be really beneficial. No, it's a great suggestion. I recommend it when people are detoxing all the time with more.

But you're right, it's a great suggestion for people who don't have room actually, you know, in their place. So the last of the seven we're discussing with autoimmunity today is trauma.

Which I'm seeing in a lot of my patients. And I don't think many people actually associate trauma, even with autoimmunity. They just were finishing up this, this amazing talk we've had today.

You and I go through this very quickly, to just talk a little bit about why healing trauma, limbic dysfunction. I mean, I'm, I'm talking to my patients all day long about how important it is.

Just explain a little bit about why it's so important to get to the source, of the trauma in the limbic system. Well, for sure, if you've had, you know, early childhood trauma or PTSD, like maybe you're a military, you know, former military, you know, little things that wouldn't normally trigger a normal person are going to trigger you to go into fight or flight.

And, you know, basically we look at the nervous system, the part of our nervous system we don't control, like our heart beating, our lungs breathing, our digestive system.

You know, we call that the autonomic. Or you can also think about the automatic nervous system. And it has three main branches. One is, optimal connection and joy and optimal life expression.

Right. And that's from the ventral part of the vagus nerve. Right. Is kind of the main conduit of that. And that's, you

know, and its main function is rest and digest and optimize, right?

Optimize the healing response. Then we have the fight or flight response. And the fighter flight's great as well. Like we fight or flight is what allows us to exercise is what allows us to perform at a high level.

You know, it allows us to have excitement. And so there's great components to that. But what happens is when you are so easily triggered and put in fight or flight and you're stuck there because of trauma, over time, your nervous system starts to wear down and then you get then basically, you start moving into kind of more of a freeze mode, right where your body actually starts to almost shut down and go into like a state of shock.

And so chronic fight or flight or in this kind of, dorsal vagal, component where you move into this, this, this, this freeze the nervous system entire nervous system starts to freeze.

That doesn't allow you to heal. Okay. And so we want to spend most of the time with our nervous system in a state of healing. And so people that are dealing with chronic trauma are in chronic fight or flight or, you know, even worse, their nervous system is almost completely shut down.

And so we've got to obviously figure out figure that out. And reroute new neural networks, right? New ways of processing information and processing experiences.

So we take joy in things. Right? There are some people like the best athletes, for example, when they study the best athletes and the way that they respond to stress, some of them get stronger and more resilient under stress.

You look at somebody like a Tom Brady, you know, probably the best quarterback that's ever played, or a Michael Jordan. And when the game was close on the line, it was like they got into kind of this zone.

Right. There's they were we talked about I just got in the zone right where their entire nervous system was activated and functioning at such a high level, and they were able to perform at such an incredibly high level.

And so this was something that didn't just come automatically. They trained it into their system. These people practice things like visualization. You know, they say affirmations over themselves.

They like literally trained their nervous system and their sports psychologists work with athletes doing this all the time. You may not be a professional athlete, but I say we're all occupational athletes.

We all have to perform at some level and the things that we do. Maybe you're a mom, maybe you're a, you know, an entrepreneur. Maybe you are a teacher.

You know, whatever it is that you do, right? Maybe you're a wife, maybe you're a husband. Whatever it is that your role is, you got to perform in that role.

Right? And so, retraining your nervous system to be able to perform in that level is so critical for your overall well-being and health. But ultimately also for your long term health in shutting down these inflammatory cycles.

Yeah. We, you know, I, I recommend to people regularly things like the any hyper dynamic neural retraining or the AI amygdala insula retraining. I love primal trust.

My wife has actually looking at it now, I'm probably going to do it with her because, I mean, I've had my trauma like anyone has had in this lifetime.

So so you're right. And it goes back to the cell danger response. You know, the the unfortunate thing about the wildfires that have been going on, you know, in the United States that sets off the cell danger response from trauma.

And if they've got Lyme and they've got Barton, they've got toxins and leaky, got all of those inflammatory

pathways. It's very difficult to get better when you're in that fight or flight mode with trauma.

So, I teach people meditation. I've been working with Tibetan Buddhist teachers for over 40 years at this point. So, you know, I have my own spiritual practice and I, I know you you do your own practices too.

But you're right. This this is really, it's a very important piece. So, David, this was amazing. We got through all seven points. Yeah, that was fabulous.

So, yeah, this was fab because, you know, I think these are the basics of inflammation, of how it affects the body, how it affects autoimmunity. How can people learn more about you.

Where can they, learn about these, you know, these tools that you have to get people better you newsletters. What's the best way for people to contact you?

Yeah. Best way is doctor jackers.com. That's my website. You can also find me on YouTube, Doctor David Jokers, Instagram, all the social media channels, and I have a popular podcast as well.

Doctor talkers, Functional Nutrition podcast. That's great. David, I really want to thank you for taking your time today to do this. I know the line community is going to get a huge amount of, really good information out of this and, you know, it and it reinforces because the things I've been doing getting in my sauna, I exercise seven days a week, I'm on my treadmill, I'm hydrating like crazy.

I mean, these are all the things I do. And the fasting component, as I said, we just finished actually the summit with the fasting and longevity. I'm about to start autophagy by I got the protein kit.

I'm in. I'm about to do it. It's not something I've regularly done, but I recognize as I'm getting older, I'm almost 70 years old. I recognize I've gotta start doing this because I want to make it to 100 and, you know, keep benefiting the world in the way I am.

And obviously, you've got a very busy, world around you as a, as a father and coach and everything else. So we all want to have optimum lives with this.

So 100% here in your wisdom. It was really great. Thank you. I appreciate that, Doctor Richard. Yeah. So everyone, thank you for tuning in today. My name is Doctor Richard Horowitz.

I'm the co-host of the Doctor Talk Healing Life Summit 2.0. We've been discussing with Doctor David Joker's The Seven Causes of Autoimmunity, which are affecting a large percentage of the line population.

So thank you again for tuning in and looking forward to seeing you another episode soon. Bye bye.