## Introduction and Dr. Burrascanou2019s Background

Hi, and welcome to another episode of the Healing Lyme Summit. I'm your host, Dr. Myriah Hinchey. And most of you watching understand that chronic Lyme disease is such a complex and confusing and often controversial topic.

So we are going to just dive right in. I'm so excited to have with us tonight Joseph Burrascano, JR, MD. Dr. Burrascano is one of the founding members of ILADS.

He brings over three decades of experience as well as research in the field of tick borne disease. He is an active author and educator to both patients and other medical professionals, and he wrote the Diagnostic and Treatment Guideline to treating Lyme disease and other tick borne illnesses.

So welcome, Dr. Burrascano. Please share with our listeners how you came to specialize in tick borne disease. Oh, thank you, Dr. Hinchey. Very nice to see you again.

Oh, what a long story. You know, I was raised on eastern Long Island, which is the little bit south of Lyme, Connecticut, next to Plum Island. And we found out that we had the highest rate of tick borne disease in the world out there.

80% to 100% of the ticks in our area were found to have Lyme in it. I mean, that's a very, very high percentage. So, you know, when I grew up, I didn't know any of this, and no one did before the days of Connecticut.

And when I came back there for my practice, I did not plan to be a specialist of any kind. I was an internist, primary care. And I saw all these patients with strange, complex illnesses that no one had a definition for.

And over time, I was kind of in the hotbed. I worked with Alan MacDonald and Bernie Berger and some of the people at Stony Brook and Yale, and we figured out what was going on.

And from the very early days, we learned how to test for it. We learned how to tabulate the clinical syndrome. And I was the first to try and tabulate treatment guidelines.

And that was that was back in roughly 1989. Yeah, no, earlier, like 8045. Yeah. So you've been doing this for your whole your whole career? Pretty much.

Yeah. I fell into it. And, you know, Willy Burghoff was in my office on more than one occasion. I met him many times. I mean, so we sort of shared this curiosity about this strange new illness, and that's how the whole thing evolved.

Yeah. Well, I'm glad that you did, because your treatment guidelines were probably one of the first things that I ever read when I became involved in treating chronic tick borne disease.

So thank you for that contribution. Oh, you're welcome. Okay, so let's jump in. So from a pathophysiological perspective When does chronic Lyme disease become chronic Lyme disease?

So like, where is that division between an acute infection and it becoming chronic? What's been found is that the Lyme infection, the Borrelia infection, will damage the immune system.

It'll activated, see a full of inflammation and soreness and the flu like symptoms. But at the same time it weakens it and doesn't allow the immune system to clear the infection or other infections that are concurrent.

And this change occurs somewhere between six months and one year of infection, even if it's treated if the infection

is not controlled, non-controlled infection for 6 to 12 months.

When I did my first studies, I noticed was about 12 months into it where people somehow the character changed. Illness became more difficult to control.

The symptoms were more severe. It's also in the co-infections, which were in the background, started to become more prominent. So in my experience it was 612 months.

Others have seen it in six months, and I guess that has to do with the patient themselves, a person who's more ill to begin with.

## When Lyme Becomes Chronic

I think it starts a little bit sooner, but so that's the range. Six months to 12 months. Okay. So it's not necessarily like the amount of time that you're infected.

It's the actual like disease state of the body that would define chronic Lyme disease. Kind of like when someone goes from HIV to having AIDS, would you say?

Right. But it is a time sequence. I mean, I rarely see or have seen the syndrome, if you want to call it, of chronic Lyme disease. And someone has only been infected a few months.

It's really much more than that. Again, my studies based on clinical findings was one year, but I guess it could be earlier in some patients. Okay. And can you tell us what is dissemination mean?

Well, that simply means that the infection, the bacterium that causes Lyme, Borrelia burgdorferi has left the skin and started to get in the bloodstream and travel around.

Now, it's very important to understand that that's a process that occurs as soon as the tick gets to your bloodstream. The mouthparts of the tick gets to the bloodstream when the bacteria start to enter.

And it's been shown, for example, in animal models as well as in some clinical series, that you can get infection of the central nervous system within hours, two days after the bite.

So it disseminates or spreads through the body really very rapidly. Right. And so I think it's important to point out because a lot so I've heard people use the word dissemination then in a way that is not correct.

Right. So if dissemination is just when it is spreading to basically all of the cells in the body, you wouldn't consider it to be chronic at that state because like you said, it could happen within sometimes even a few hours, whereas a lot of people talk about disseminated Lyme disease and or use that term interchangeably with chronic Lyme disease.

Well, there's a subtlety also. It's been found that certain strains of the Borrelia germ do not disseminate. They stay in the skin and that's it. So it specifically was coined the term dissemination was coined for that strain of Borrelia that does not stay in the skin but does disseminate.

Interesting. Yeah. Okay. So I want to talk a little bit about the acute infection. And I want to get your stance on this because obviously we have the state of acute Lyme disease, right.

To be able to prevent it from going into chronic Lyme disease. So when someone has acute Lyme, what is the minimum like the absolute minimum days that someone should be treated to have the best chance of eradicating that infection?

And what is the desired antibiotic or antibiotics? And we're talking you saw the tick, you got the tick off like that type of situation. Well, how many hours do you have?

You see, I'm one of the people who, from the very first beginnings of this whole syndrome epidemic, whatever made the point that, yes, it disseminates very early and even in the earliest stages of Lyme disease, you have to give a full dose of treatment with an antibiotic that's going to be strong enough and a high enough dose to penetrate all the tissues, including the brain.

Because if you don't, what's going to happen? If you use a weak treatment, you kill the weaker germs, leave the stronger ones behind the kill the more superficial ones, and leave the deeper ones deep to do their damage.

So in terms of how soon after the bite, I think the sooner the better.

## Early Treatment and Preventing Chronic Infection

I'm sure if a day or two or three goes by or even maybe a week, although that's pushing it before you get treatment, that's probably okay. But regardless of when you start, you really have to use a full dose.

I hear people say, oh, use a smaller dose because it's in the beginning. Again, I've done a lot of clinical research. I've seen 16,000 Lyme patients in my career.

I might be even more. And again. And again and again, the sickest patients were the ones who got substandard treatment in the beginning. They had the tougher germs, the deeper ones.

And that's what caused the trouble over and over again. I've seen it. Now, that's a whole another topic. How do you treat early Lyme disease? Well, you have to go back to the science.

The Lyme germ is a very slowly growing germ, but it doesn't grow steadily. It grows and cycles grow for a period of time, then go dormant and then grow again and go dormant.

And this is a cycle in lyme that's about four weeks long. So if you have an established infection, it's my contention that you need to treat for one or two bracket, one whole generation cycle.

The other words, if you start to treat it and stop while it's in the dormant phase, it's going to wake up and make you infected again. So my contention is that you need to treat to bracket that whole generation cycle.

So for early Lyme disease, even my minimum recommendation is six weeks. Now, in terms of preventing Lyme, let's say someone has an infected tick bite.

It's a descent, it's an engorged tick in your son to get a reaction at the bite site. And you want to prevent life from happening. The dose and the duration is kind of a risk versus benefit equation.

For example, if you use a medication for three weeks, you're going to have a pretty high success rate, but not 100%. If you go to six weeks, it's still not going to be 100%.

It's going to be much, much greater than what it would be at three weeks. But on the other hand, you don't know if you got the infection just because it's an infected or an engorged tick.

So what's the risk? What's the benefit? So, again, for just a bite, that's high risk. I would say three weeks is minimum. Six weeks is probably optimum.

Okay. And you talk in your guidelines about how, you know, Borrelia lives in three different forms in the body. And so therefore, you need the at least three different classes of antibiotics.

Like, at what point does that become relevant? Right. Where just doxycycline alone isn't going to be good enough. Like how far after the bite would you say.

What you can do with the very unique organism? They can change their their physiology, their makeup, and their

metabolism to try and evade if defenses and even antibiotics.

So that occurs by the time the immune system starts to develop and start to activate against the germ. The germ senses it and starts to make its changes.

So we know that I am, which is first antibiotic to appear, is not completely effective in eradicating infections. Just sort of gets the ball rolling. It's the AG that starts to attack and that doesn't really form for several weeks.

It starts actually earlier than that, but it doesn't really get good level until several weeks, maybe six weeks, 4 to 6 weeks into it. So I think I can prove this with any study, but I think that probably 4 to 6 weeks after the infection is when you start to think about it from a clinical point of view.

An infection with Lyme begins is kind of nonspecific body aches and pains like you've got a virus, but over time it starts to develop into a multi-system illness that migrates from different parts of the body to other parts of the body.

And it goes through these four week cycles that correspond to the germ regeneration. If the person has gotten to the point where it's become disseminated and multi-system migrating and starting to cycle, then you know for sure that the germ is estab, it's hiding, it's going into biofilms which can protect it.

And that's when you have to start thinking about treating the different forms. Now, when you say treating different forms, one of the things that people worry about the most are the cystic forms of Borrelia, because they'll form a hard shelled cyst.

And you can see pictures of this under the microscope that resists common antibiotics. And the only class of medical antibiotic that really has been shown to break open the cyst are the drugs called the Azores.

Metronidazole, which is fragile and tend to dissolve, which is tend to max tradition.

## Borrelia Forms and Cyst-Busting Therapy

What people have done would be they treat Lyme with one, maybe two antibiotics like a penicillin drug added to maybe clarithromycin, which is by accident and the patient improves to a level and then kind of stop improving.

And then you think, well, you know, we're hitting a plateau. We have to start to add this fragile drug. So one of my old friends, the late great Warren Levine, who's a really deep thinker, he called me up and said, you know, people do that and they get these cysts form and then you start chasing a tail trying to get rid of the cyst.

He said, What if you started the people on the Fragile with the other antibiotics? There is no chance for you to go and hide because you already got that covered.

What I did was I went back in my charts and there are few people, for whatever reason, did start that regimen for not that reason, but for other reasons.

And in fact, they did better. So my recommendation now is if you have the disseminated multi system migratory cyclic form of Lyme disease, which means it's really getting established and going to start treatment, you would add a cyst buster right at the very beginning.

And you know, nowadays, you know, verbally there are botanicals that are thought to be cyst busters as well. So whatever your approach is to treatment, I think it's wise to do that at the very, very beginning.

Yeah, just make sure you have the bases covered. And like you said, instead of chasing it, have something that's covering all three at once so it can run and hide and flip back and forth as much as it wants.

But you have it covered. That's right. Yeah. All right. So here's the million dollar question. Once you have Lyme, you always have Lyme. What's your response to that?

Oh, I have to say no. You know, again, I've treated many, many patients and I've gotten many, many, many of them well and they've stayed well. You know, I've even seen you know, I still live in my hometown, my local area.

And I see people who I've treated ten, 15 years ago or more and they say, you know, after the treatment, I go, well, and I never got sick again. What I found again through study is that if you can get someone to the point of being over the symptoms of the tick borne disease and they don't relapse and they haven't relapsed or gotten bitten within three years, then they're never going to have it come back.

Now, the problem is a lot of people don't get early treatment and they don't get aggressive treatment. They don't get appropriate treatment and they fall through the cracks.

And, you know, those are the conditions that start to happen when you're so badly infected, you get a buildup of toxins, you get overgrowth of other germs.

Germs that are hiding can reactivate. And it's a much bigger problem at that point. But if you can get all of this put together and put to bed all time, I mean, it can take months, even years of treatment, but you will get the patient well and they stay well until the next tick bite, unfortunately.

Yes. Unfortunately. Remember, don't feed the ticks. Yeah. Such a I can't tell you how many patients we've completed treatment, weaned them off their protocols, and then like two weeks, two months, a year later, they're back with another tick bite.

Devastating. I know. At least they know how to handle them at this point. So, you know. Yeah. And they get early treatment. They see the right person and so forth.

Right. Yeah. All right. So how do these co-infections complicate the prognosis and the whole picture? Well, you know, ticks are like nature's dirty needle.

They're like a sewer. They have dozens, if not more different kind of potentially harmful organisms in them. They've got bacteria, they've got protozoa, they have other parasites, viruses and so forth.

And so when you get a bite, it's possible. And some cases actually probable that you get more than one infection. Now, what I always say and a lot of people don't agree with me on this, but I say that when you have what's called the co-infection Lyman others, it seems to boil down to always being the alive if you can get the Lyme controlled the other ones are difficult but controllable.

Again, it's because the Lyme is the one barrel is the one that hurts the immune system. Okay. So if you can get that controlled and that's hard to do, but if you can do that, then the other co-infections are not as difficult.

But the problem is, for example, Babesia, which is a parasite. When that's present with Lyme, it makes two Lyme more severe, more treatment resistant, and takes longer and more aggressive regimens to get rid of it.

So that's a nasty co-infections again, and approximately at least in my neck of the woods, two thirds of people of Lyme have been shown by blood testing to have babesia with it.

That's a cold fact. Coinfection That's a problem.

## Recovery, Relapse, and Reinfection

So now, going back to the beginning, I don't want to get too long winded about this, but if you treat Lyme disease early before it starts to get really into the chronic phase and you treat the Lyme itself, the Borrelia aggressively, the co-infections very often seem not to be an issue either because the immune system can contain them.

If it's a healthy immune system and so forth. It's only when you get into the chronic phase, when the people start to have the immune system break down to the co-infections become a real big issue because there are many

exceptions and some people started babesia and then later get Lyme or the BS is prominent and then the Borrelia come out after that.

But anyway, the co-infections are always an issue and the BS is the worst when it comes to making Lyme worse. Yeah. And then also for our listeners that don't know, Babesia is a parasite.

So like standard antibiotics that treat bacteria or kill bacteria aren't really going to be effective against babies here, right? Well, that's right. And the problem with treating the tick borne diseases is that, as I mentioned, you can unfortunately get a variety of different germs at the same time.

And medication, for one, does not necessarily work against the other. And the more advanced practitioners don't use one medication. They use a combination of medications.

Often adding botanicals to it nowadays as well, because you want to blanket the different types of pathogens that can make you sick. Yeah. Okay. So I have a ton more questions for you, but you're really the expert and I want to hear from you.

You know, as I was preparing the questions, like, what do you think? Like, so what are the top three things that you think people need to hear about Lyme and co-infections?

Well, one thing is that you have to see the right practitioner, because if it's properly treated, you can get well, you can get over it. It's not a hopeless case.

So that's very important. Second thing is that as a patient, you really need to become your own advocate. Keep copies of all your records, lab reports, doctors, notes, X-rays, whatever is being done.

Keep your own records. Learn about the illness. Teach your caregivers often friends and family, coworkers. What's really going on to get the proper support and advocate for yourself.

And the final thing is these illnesses are clinically managed. There's not a blood test you can do or a scan or anything you can do on a regular basis to see how well you're doing, if the treatment is working and so forth.

It's all based on how you're feeling and what kind of things are happening. So the third and very important thing that I had all my patients do is keep a daily diary, because you'll see over time that there are good days and bad days.

With Lyme, you see a four week cycle. If the treatment is working, the bad days are less bad and there are fewer of them and the good days are better and more good days.

So you want to see that evolve. You want to see if a plateau happens. We have to start to change treatment or or change regimens and so forth. So the Daily Diaries, the other key piece to this.

Yeah, it's super helpful for practitioners to be able to tell to and yeah, if a patient comes in and they're having a bad day, everything's worst. If they're having a good day, everything's better.

So it's nice to have as close to objective, you know, information to look at as possible. And also, you know, I tell the patients, don't go crazy and have this like every single day, every little thing and change things because number one is going to make you crazy.

And number two, you have to put a time you're not going to do it. So have a calendar, which is like a one month at a time, and you put like a black that's a bad day.

In a blue is a good and yellows in between, you know, whatever you want to do so you can hold it up and say that's the pattern.

## Co-Infections and Babesia

And look at this, a four week cycle. This is like a ten out of ten is now four out of ten, whatever way you want to do it. A number or a color scheme or whatever, and just do a monthly calendar.

You don't have to write things down in detail, but you do want to mark on the calendar significant symptoms, changes and medications that kind of thing.

Milestones. Right? Yeah. Important to keep track, but don't dwell. Good idea. So doctor be asked to share with our listeners how they can reach you if you want to be reached as well as if you have any exciting news or events coming up that you would like to share.

Well, I don't have an office practice anymore. I'm doing straight research for different companies right now. So I'm not available to see patients, although I do consult with physicians on their patients on a regular basis.

So that's one way. There's a conference coming up at the end of February into March that I'll be speaking at, giving two lectures. That's in Austin, Texas.

That's TAF. I am right with you. I will be there. I will be with you. Excellent. Wonderful. And then always, we have the Islands annual conference, right?

That's true. And also what I do in my educational efforts, I've done a number of different webinars that are available online in different places. Wonderful.

Okay, so for the listeners that are subscribe or sit tight, we're going to dive deeper into the subject. For those of you who would like to become subscribers, you can click the button below and sign up.

Okay, so let's see. Oh yeah. So do you also recommend so you brought up the importance of keeping track of your symptoms and you were talking about the life cycle and all of that.

Do you think that it is important to treat or two months past the resolution of symptoms? Is that one of your sort of suggestions guidelines as well? I know that that's something that I learned at islands.

I can't remember if that was one of your recommendations or not. Well, it goes back to this four week cycle of the Borrelia, you know, if the treatment is working, as I mentioned, the bad days get fewer and the good days get better and you have the calendar to look.

And, you know, I write the third week of every month as my bedtime. So if you're getting better and better and you get to the point where you expect to wait week and you don't have it all, maybe that's controlled.

On the other hand, maybe it isn't. So what I always recommend is go through one more cycle just to be really, really sure. So that means at least one more month to six weeks of treatment, others a little bit more conservative.

They like to go 2 to 3 months from the end of less symptoms. But again, keeping the calendar is a really important thing because it's the guide. I mean, that's the way you manage the line patient is not by blood tests, it's by clinical picture, right? Yep.

So what do you when you were practicing with patients, what did you tell patients to expect? Like, how did you help them to navigate this chronic illness?

Well, expect medication, of course, expect frequent office visits. I think it's so important to see the patient put hands on the body, examine them, have an interaction, because that's really, really important.

So many let's say it's not an alarm world, but in other words, of medicine, they'll see you for a condition and then that's the end of it. They never order or for a follow up visit.

I always insist on follow up visits. So that's an important thing. I have to tell them that unfortunately it's a difficult

illness because there are many uninformed and misinformed clinicians out there that might lead you down the wrong path or, you know, misdiagnosed you, mistreat you.

So that's a very big danger. Now, the unfortunate thing is that it's a very expensive illness. You do end up seeing a lot of different, you know, medical providers.

## Top Lessons for Patients and Daily Tracking

You start to have to order tests from laboratories that don't always take insurance and it becomes expensive. And the other thing is that it does take time.

And the sickest of my sick patients who I got, well, I would tell them expect three years of some kind of treatment, maybe not continuous antibiotics, but it'll be three years before you back to yourself again.

And that generally holds true because many people get better sooner than that. But for the sickest of the sick, expect three years. Yeah. Good points.

What would you in addition to those things, what would you say are like the primary challenges that a patient would face? Well, a lot of things. One thing is your outlook.

You know, it's very hard when you're chronically sick and when you look well, but others don't think you're sick and you really are. It's very hard to stay positive and optimistic.

But I can tell you again and again, I could tell right away from patients going to get better or not by my first visit, by whether they say, oh, poor me, I'm so sick.

Nobody understands my life. They remain sick for whatever reason, whether it's the germ affecting their psyche or the other way around, I don't know. But those who came and said, I can't stand this, I'm going to fight it no matter what it takes when get over it.

They always do. Yeah, I think one of the things that has come out, you know, a lot in this summit is that your mindset matters. You. Know, And if, you know.

Research has also shown I mean, you can't blame the patient for all this because research has shown that infections do change the way you think. And that sometimes is a big challenge.

But, you know, if you're a patient in that situation, just understanding that this is not you, it's not your fault, it's part of the illness. You're going to fight this and get over it.

And that's again, why you need good support from your practitioners, from your family, your caregivers and so forth. And that's why I know you educate yourself, but you educate them as well.

Yeah, and I was going to make that point, too. I think if if every Lyme patient could bring their spouse or their, you know, their parent or their their children, you know, if they're old enough, you know, to come in to really just understand.

Because I think that a lot of them that have just been dragged through the system, they're hopeless. And some of them almost rightfully so. Right. They've been told it's in their head.

They've been told there's nothing wrong with them. And yeah, a lot of people just really give up hope. And it's like they think that their own family members don't believe them.

So I've had a lot of success just being able to explain in front of the patient, you know, to the family member that they're not making this up, you know, and that like, listen, if the if the brain is on fire and, you know, we just I did an interview earlier today with Dr.

Nancy O'Hara on Pans and Pandas, and it's like, you know, the basal ganglia encephalitis causing OCD, panic, anxiety, rage, you know, all of those things.

And it's like it's it's very, very real. And it's not just a phenomenon of like, oh, I've been sick, so I'm depressed or anxious. It's like, no, like the brain cells are literally on fire in the certain areas that cause those behaviors.

Well, think about it. If you're a patient in that situation where you're you know, you in layman's terms, your nerves are on edge and you're frustrated and you're angry, you go to the wrong physician.

They say, well, I don't know what's wrong. If you will do a blood test, set a standard lab or the hospital I work for and pick up rate is less than 50%.

## Treatment Expectations and Patient Mindset

So they don't know what's wrong with you. And they do a lot of different tests and they say, but, you know, my knees hurt. So they send you to rheumatologist or an orthopedic center.

All their tests, they say, Well, I know what's wrong with you, but by then, you know, you're getting tingles and the nerves and say, Well, I'm going to go see neurologist.

You get a big test workup, maybe even a spinal tap, and there's nothing conclusive. So then you go on to someone else and they say, Oh, it's got to be in your head.

And by then, you know, the spouse or the family members are saying, Oh, come on, here it goes again. You know, they spend time, money, effort waiting for scans to take three weeks to get done and all this happens.

So they're angry and I don't blame them. I would be angry, too. And that's why when they come to a practitioner is Lyme literate and they say, wait a minute, we know what's going on with you, we can fix it.

It's like, whoa, the light bulb is on. You know, the curtain raised. It's like, oh, great. But then it's up to the job of the practitioner to, you know, to carry it out and to make sure that they do get better.

Yeah, I agree. So what resources are out there for caregivers and family members to educate themselves and become more Lyme literate and learn how to support a patient navigating chronic Lyme disease?

One of my favorite organizations in that regard is lyme.org. That's what they call themselves, and that's actually the website lyme.org. It's very scientifically based, but it's also something that's amenable to the nonprofessional, but it is also geared toward professionals.

They're great, great articles. They have newsletters, they have educational, you know, resources that are really, really important and very helpful. And they're a bunch of really great people.

So I support them in that regard. Wonderful. And do you have any advice for patients on how to talk to whatever other medical providers like that they have to have in their lives that aren't Lyme literate?

Like how to broach the subject? Because I mean, I had a patient tell me last week, I'm not even kidding that. So she went found a new primary care physician.

She mentioned to them that she had chronic Lyme disease and the doctor said, I don't treat Lyme disease. And they didn't mean chronic Lyme disease. I'm sorry.

Let me rephrase. Also said I don't believe in Lyme disease. This is in Connecticut. I mean, not that Lyme isn't everywhere in the world, but, you know.

Like I was seeing patients as the Lyme specialist, let's say, because most of my patients said, you know, by my

time I was really into this came from out of town.

So, you know, I always insisted to have a primary care doctor for day to day concerns and things like managing blood pressure or whatever else, and to be there if, God forbid, there's a side effect of medication and they live 500 miles away.

## Resources, Primary Care, and Closing Advice

So I always insisted, number one, that they have an active primary care physician that they seen a very good basis. Number two, I would every visit make up a summary of the visit and send it to their primary care physician so they would know what's going on.

And then I'd have the patients see that that physician on a regular basis, even if there's nothing special happening, just to keep them updated in the loop.

So now that means a primary care physician actually is relieved of the duty of dealing with Lyme disease, because now that's not their department. Just like they won't have to worry about someone getting neurosurgery because that's not the department of their primary care.

So it relieves the primary care doctor. And the patient can say, well, it's not a matter of belief. It's not a religious disease. You know, it's scientific, but don't worry about it.

You hear if my day to day concerns, we're going to keep you in the loop. But if they have a problem related to the tick borne disease, then I'll call my specialist.

And you can always call that specialist anytime you like and get the records. Now, a physician who was a Lyme denialists will never on their own read about Lyme disease in a way that's meaningful.

So if they're really, you know, hostile toward you, then it's best to just change physicians. But on the other hand, you don't necessarily have to fight.

You know, you do your thing with your Lyme practitioner and and leave your primary care person to do primary care. Okay. That's really good advice. Thank you. Okay.

So anything else that you think our listeners should know before we wrap up tonight? Well, as I mentioned several times, education is really important for yourself, for your caregivers and so forth.

And so there are several websites you should know about the website lyme.org, of course, as I mentioned, is a great resource for everybody. Patient practitioner alike Also they are the Lyme organizations ILADS International Lyme and Associated Diseases Society.

They have a great website with a lot of resources. Lyme Disease Association. Pat Smith's organization Likewise very scientific, very solid place to go.

And interestingly, the Lyme disease lab called IGeneX has on their web page a lot of resources that people are often not aware of. They have webinars. Many of my webinars are on there, too.

They have educational articles and monographs and so forth. So it's more than just what the tests are. It's also educational resources. Those are good places to go.

And also because that website from the laboratory, it's specific to the tick borne disease. It's like you get to spend hours looking on YouTube and finding, you know, nonspecific things and trying to search for what you want.

This way is a direct path to getting your answers. Wonderful. Thank you so much. Thank you for being here with us tonight. And oh, my pleasure. Thank you to all of our listeners at home.

We will see you next time for another episode of Healing Lyme. Goodnight. Goodnight.