



Your Functional Medicine Expert®
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[#4: Dr. Jill interviews Dr. Chad Prusmack about COVID-19 Testing](#)

Text:

Dr. Jill 0:12

Welcome! Good evening to all of you who are joining us tonight. I'm just going to check in and make sure we are showing up on your page. And then I will welcome Dr. Prusmack.

Dr. Jill 0:48

Okay, we are on, Dr. Prusmack. Awesome. Well, hey everybody, if you're joining us live tonight, just a reminder to throw in your comments in the section there. I will try to look at multiple screens and get to your questions and comments. We have an incredible treat for you tonight because I've got one of my good friends, colleagues, and just someone I respect so greatly in the world of functional medicine—a neurosurgeon. I'll give it a brief intro in a minute. But Dr. Prusmack is a great guy. And I want to briefly talk on a personal level first. This guy has led the Denver Broncos with his neurosurgery skills. He's created Resilience Code—this amazing center in Denver. And again, I'll tell you a more formal bio on him in just a second. What I love about him is that he has the inquisitive mind of a scientist, but he's got the heart of a giant as far as how he cares for his patients. We clicked right away when we met a couple of years ago. Dr. Prusmack, we love to really dive deep into the mysteries, and when we get talking, it's fun—it's a lot of fun.

Dr. Jill 1:51

I want to just give a formal introduction really quickly, and then we will jump right in. Dr. Prusmack is an East Coast native. He obtained his bachelor's in biophysics at Harvard University and his medical doctorate in neuroscience from Columbia University. He went on to do his neurosurgical residency and fellowship at the University of Miami and is now a partner at the Rocky Mountain Spine Clinic in Denver. He has a lifelong passion for sports. He was captain of the La Crosse team at Harvard and is currently a neurological consultant for the Denver Broncos and the US Olympic team. That passion and education came together when he opened Resilience Code in 2017. I will be sure to link to Resilience Code in the comment section so you guys can check this out. Chad, first of all, welcome!

Chad Prusmack 2:38

Thank you, Jill. It's good to see you again!

Dr. Jill 2:40

Yes, you too. And, gosh, we have had such a fun time talking about patients and trying to solve medical mysteries. Now we've got the virus, and I know you and I are both on the front lines, really trying to figure out not only what's happening to our patients but [also]: How do we get out of this epidemic?

Chad Prusmack 2:59

Yes. Well, thanks, Jill. That was such a sweet introduction. The same feelings toward you. Just so everyone is aware, Jill has basically taught me everything I know about functional medicine and has been one of the best academicians, leaders, and friends. So, right back at you, Jill, you're a very special person. So, thank you for being you.

Dr. Jill 3:20

Thank you; it's an honor. I'll just tell you a funny story. I remember that I'm going along in 2017. I have patients and all that, and emails and stuff, and I'm looking through my emails, and I'm like, "Dr. Prusmack." And I get a lot of inquiries; physicians ask some questions about this and that, or whatever. And I'm like, reading through; blah, blah, blah, blah. "Neurosurgeon for the Denver Broncos." I'm like, "Who's this? What does he want?" It was awesome to meet you. Then I think we talked by phone a week or so later. I love your heart because there are not a lot of neurosurgeons I know who have the kind of heart that you have. That comes across because it's a passion and the purpose that drives our inquisitive minds as far as finding the answers because we care about the patients, right?

Chad Prusmack 4:03

Yes. I mean, you care about the story, and every person, every case has a story. The thing about a combination of functional medicine and surgery is that you get to bridge the story; it's the patient's health and psychology. What's playing a role in their outcomes? Without that 360-degree view that functional medicine gives, you really lack a basic understanding of the approach to everybody's story and even today's story with the COVID-19 role.

Dr. Jill 4:38

Yes. You're so right. You know, a story is so critical. We learn in medical school how to get a good history, and it's all [based on the patient's] story. But don't you find even more now after we've been several decades in practice, like listening to the story is everything? That's the foundation. I find almost all the clues that I need. Don't you find that so? I mean, yes, we love the science; we love labs. Tonight we're going to talk about some cutting-edge stuff that you guys are doing at Resilience Code. But don't you really think it all comes back to listening to the patient?

Chad Prusmack 5:07

It's all that first interview and understanding the triggers, their background, really looking for patterns, and bridging them together so you can not only understand it yourself, but you can explain it back because it makes sense. It kind of has to make sense, right?—because we're here and [we] act for a reason. And the biology behind us gives us those reasons, and there are just different layers to it. So I mean, even today I talked to a 17-year-old and his mother, and he has cyclic vomiting early in the morning and before games. He's a lacrosse player. And you've just got to dig into the history. It turns out [he had] pneumonia when he was a child, [was given] a ton of antibiotics, [was exposed to] mold overgrowth—that whole pattern—and a histamine surge. At the end of the day, it was a six-food elimination diet [with] Pepcid, digestive enzymes, and antifungals, and everyone got it. So thanks to you, another young man is going to be well soon.

Dr. Jill 6:18

You are so kind. You know, I want to hear your story, Dr. Prusmack. First of all, I want to go way back to how you went into medicine. And then I want to know how a neurosurgeon got into functional medicine.

Chad Prusmack 6:28

Yes. I just guess I don't like school enough. At the end of the day, I was a lacrosse player. After I went to Harvard, I got such a kick out of the people there. I studied biophysics, and I realized that the subject matter was unique, and I loved it. But the community around that just wasn't who I was. I was a little more social than wanting to go forth with a career in biophysics, so I applied to medical school. Fortunately, they accepted me. I got into Columbia, and it was just such a great experience. My preceptor there was Dr. Mehmet Oz. He was such a stud that I looked up to this guy, a brilliant ex-Harvard guy, a good person, holistic, and he was a cardiothoracic surgeon. I just remember seeing him; he would bound from place to place instead of walking because he needed exercise in between cases. So I was so enamored with him that I went on to sort of pursue a career in cardiothoracic surgery.

Chad Prusmack 7:40

Then in my fourth year, we had a neurosurgery rotation, and I remember distinctly going in and the music was awesome. They were playing Metallica. The guys were all excited. And they were like: "Hey! Come on in. You'll scrub in?" I was like, "Sure." I scrubbed in, and then they gave me the drill, and they said, "Okay, drill here and don't miss." So I took this craniotome and drilled, and it went through. I sat there and got tachycardic; I started sweating, and I passed out. I looked around, and they were all laughing at me. They were like, "Hey, you broke your cherry!" is what they said. And you're like, "What do you mean?" They're like, "It's supposed to do that." And they're all laughing, and that was my induction into their weird world. I was like, "I like these guys."

Chad Prusmack 8:34

So I then went to neurosurgery, and it was the right thing [for me]. The academics of the brain, the intensity, brain spine, pediatrics—you got to see a lot. And the one thing that I remember that tails into your educating me and where I am now is that we ran the ICU by ourselves. So our attending Dr. Keros wouldn't let us do any consultations, so we had to intubate and put in Swans. We had to take care of everything. And after a seven-year program of doing that, you really are a well-trained marine. You just have such a broad, vast knowledge of traditional medicine and neurosurgery. So going out into the world, I think we were really well prepared. Where I am today, I just realized that you have to fill in the blanks outside of your surgical prowess and that we all can't be so specialized that we are ignorant of or blind to the big picture. If you miss the salient, juicy parts of life and science, you really end up in a more ignorant place than you started out. So the flavor with which functional medicine [is performed and] how you approach people and problems—that's why I am here today, and I'm happy to help.

Dr. Jill 10:03

I love that. And I want to know: What was your first introduction to functional medicine? What was the doorway into functional medicine for you?

Chad Prusmack 10:11

It was the internet, seeing your website, and then putting together, "This makes sense." All this stuff I was trying to do with supplements and nutrition using my biochemistry textbooks, I was like, "Wait, they're already doing this." And I was like,

"It's functional medicine." I was like, "I've never heard of that." So it was your website that then led me to the IFM website, which led me to the A4M website, and then the Bredesen website. Then at the end of the day, I was overwhelmed, and I was just like, "That's my next chore." So you were there in the beginning; you're here now. And [with] the education and experience I've had, we've treated, as you know, over 500 patients here. We specialize in neuro-functional medicine, but [we] do all functional medicine. It was you, and then it was the spirit of the game, I guess.

Dr. Jill 11:11

Yes. Gosh, I love that because even I, 20 years ago—it's been a while now, but I remember the same thing. We know in our hearts that the reason we go into medicine is to find the root cause. It's to solve problems. I was bioengineering—like, you're biophysics—so I loved processes. I loved complex equations. I don't do basic arithmetic at all, but I love differential equations and quantum—

Chad Prusmack 11:33

[Inaudible] calculators [inaudible].

Dr. Jill 11:34

I know. What you and I do best is take massive amounts of data and synthesize [it to] come to the conclusions of "What is this data showing us?" and also just look at the patterns, right? It's really pattern recognition.

Chad Prusmack 11:47

That's right.

Dr. Jill 11:48

What's interesting is that I knew what I wanted to do in my heart, and when I first heard the word 'functional' medicine, it was like: "That's it—that's what I want to do." So we knew before we had a name for it, right?

Chad Prusmack 11:58

That's right. You almost have to be a patient yourself to get it, because when you're a doctor, you are led down this allopathic pathway, and your process is pathologic disease and medications and interventions, which is not the whole story; it's just the tip of the iceberg. As you know, you were the one who diagnosed my Lyme disease, my mold toxicity, et cetera; you gave me a 'why' and told me my story. That

was the missing piece. And I think that when you start to be able to... What's this, playback?

Dr. Jill 12:44

Yes. Hold on. Let me get rid of this. There you go. Sorry.

Chad Prusmack 12:48

Oh, no worries. But like you're saying, having then had that experience cathexed with the education, you then have a way that you could get out of any problem because you can figure it out once the functional medicine process is layered on top of the allopathic process. You can fill in the blanks—right, wrong, or indifferent. And you're there to help the person in front of you, and you have so many more weapons.

Dr. Jill 13:20

Yes. It's like our toolbox is bigger, Dr. Prusmack, because, honestly, what you and I love is that we use great science and great medicine. It's not like we throw away our allopathic training; I mean, that's the foundation. I think that's what people come to both of us for. Hopefully, we're still great clinicians at the core; we're some of the best clinicians bringing that there. But then what we do is hopefully have a bigger toolbox, more things to use [while] diving deeper.

Chad Prusmack 13:46

Yes. You know, Jill, allopathic medicine is a disease care system. There's no one drawing the line for health care or authentic health. So I think that functional medicine is the best vehicle to start to academically approach: "How do I stay well?" versus "How do I get better from being ill?" But then once you have the two, you'll connect them, and then you'll say, "Oh, it's this toxin, which leads to this inflammation, which derails my immune system, and subsequently I have cancer" or "I have heart disease." And then, once this gets hot, as you know, randomized controlled trials will occur. But philosophically, it's impossible to do because it's almost like you're applying quantum physics to relativity. It's like different domains—the laws don't work. The laws of the clinician don't work as the laws of group medicine based off of randomized controlled trials.

Dr. Jill 14:46

And randomized controlled trials, which we were taught in medical school, [are considered the] gold standard of any process that we do or any decision that we

make; they're designed for drugs A versus B or A versus a placebo. So when you have massive amounts of variables, like someone with Lyme disease and a virus, and they have mold exposure, and then they have 20 supplements, three medications, and an IV, the complexity level does not lend itself to randomized controlled trials because you cannot explain away the variables. So it's like we have to go into another realm of science. And the other thing is that the science is coming out—we're going to get to the pandemic, I promise you; just hang in there, especially in the pandemic. I don't know about you, Chad, but data is coming out day by day, moment by moment, which means the science is actually right in real time. As clinicians, we use it—30 years ago, this study came out. It's been proven over and over and over again, so we're going to use this drug. Well, Chad and I are kind of on the bleeding edge of what's coming out, and we're watching. Number one, it's safe. Number two, there's decent data coming out [showing] that it's effective. And as the data builds, we may implement some of those cutting-edge treatments before there's a huge randomized controlled trial because we don't want to wait for our patients 30 years. Any comments on that, Chad?—because I feel like we're pushing the envelope. It's part of what gives us new opportunities and some of the stuff we're going to talk about tonight.

Chad Prusmack 16:09

Yes, Jill, I mean, I think that the symbiosis is necessary for evidence-based medicine, looking at drugs and making sure we have the textbook to understand the drugs. So I think that that provides the content for some, but the context is lost. You go into war with the army you have, and every person you see has a war inside of them that you have to find peace [with]. To do so, they're not going to wait for a randomized controlled trial, let alone understand it. Yes. So I think it's this nice symbiosis between the hard-core scientific community, the disease care community, and there is the clinician, and trying to piece it all together. At the end of the day, we just all want people [to be] better, as you know. I think we're as necessary to the big cause through learning one by one as they are [by] looking at maps of COVID-19 and trying to look at the spread.

Dr. Jill 17:17

Yes, they're all needed. So one more thing before we jump into the virus and what you've been doing is that I want people to know what you've created in Denver. I want people to know, first of all, your vision, how it started, and then: What are you doing now with Resilience Code?—because people need to know about this.

Chad Prusmack 17:32

Yes. Well, thank you, Jill. So the resilience code is what we call an infinite health center. It's our best go at a center that tries to use data on large scales to find codes in clients—sick, well, or sports performance—and to use those broad masses of data and apply both allopathic and functional medicine to them in order to achieve whatever goal that person comes in [with]. What people lack, I believe, is a clear road to performance goals. That could be, "I want to fix my Lyme disease," "I want to score 5,000 touchdowns," or, "I want to get rid of my anxiety." So once you understand what that goal is and set it, you then need a set of circumstances of the state of the person now—what I call situational awareness. I want to know about the body, the blood, and the brain as a pattern, and then apply things to them that I can track, and then see if we achieve those outcomes for that patient. So say that patient has Lyme disease and joint pain, and one of her goals was to alleviate joint pain. "Did my interventions work?" Track it, measure it, and, at the end of the day, become successful. And if you apply this algorithm of testing—treat, track, and retest—we'll learn very quickly because you get so much out of the one-on-one relationship.

Chad Prusmack 19:16

A whole side of the coin that we don't talk about is someone who wants to recover quicker, who wants to make it in the NFL, and [who] has similar things that hinder them back. A lot of these football players have dysbiosis, and treating their gut treats their soreness and their ability to recover, as you know and we've talked about. So this center is able to deploy the tests, do the tracking, and deliver the full cycle of care in one 40,000-square-foot building, being very humble and knowing that we'll make mistakes but tracking everything so we can share that information. And lastly, [we] use a diverse group of very intelligent people, so that one day you won't go to gyms and a primary care doctor; the Resilience Code, which will have doctors, strength and conditioning coaches, rehab, the full cycle of care, [means] that we'll learn more about how we stay well just as we do on how to stay alive in the hospital.

Dr. Jill 20:16

Amazing. I love what you've accomplished, and I have seen through the years where you're at. So, let's talk about the virus. Before we jump into testing, we both believe that testing is going to be part of the way we get out of this and part of the way we dig our way out and get society back to normal, and we'll talk about that and what you're doing. I really want to hear about the statistics and the data that you're producing there. But what are your thoughts in general about the situation we're in? That could pertain to the environment and toxicity and viral load, or it could

just pertain to how we're dealing with this and any thoughts. I would just love to know your brain on COVID.

Chad Prusmack 20:56

Yes. I'd say the number one thing is that we're all a team and that you can't let the small print get in the way of the big print, which is that we're here for each other. We are all going to make mistakes. We're all going to get anxious. We're all going to act weird. But at the end of the day, if we work together and put aside our egos [and] our biases, we'll be just fine. The world has gone through much worse iterations of life. When I look around, I'm not in a holocaust. God bless those who had to go through that. This is not the Spanish flu. The HIV epidemic was scary in its own right. At the end of the day, we all get through it. We adapt. We become more resilient. I think we have to take that perspective. So humans first. Two is that you've got to dissect this out in layers. There are the front lines in the hospital—all the resources needed to go there. But there are sufferers on route to the hospital or out there, maybe propagating and transmitting the virus, which needs to be dissected, pattern tested, and then treated accordingly and quickly, so that we can get back to our own lives and get this society back [up and] running. So when I look back, it's: Arm the special forces that are in the trenches. But all of us strategists should not rest until we know which way this is going to go, and what we've got to do is learn how this virus is in the non-lethal population.

Dr. Jill 22:48

I love that, Dr. Prusmack, because what I'm seeing in my little, tiny sphere is that when we first started with the epidemic, we were isolated and doing virtual consultations in a day of 10 patients. And as I talked through those 10, three or four of them were what I call "presumed COVID-positive," meaning they fit exactly the clinical picture, and I gave them a presumptive diagnosis of: "It's very likely you have COVID-19." So if that was my 10 patients, and three of them were presumed positive, that meant that on my very first day—this was a month ago—30% of my patients had COVID. And guess what? None of them had testing [done]. You and I understand this. You and I understand that the availability of PCR testing was slim in the beginning—it's still slim. So from the beginning, they were recommending that high-risk patients—[those] over 60, [those with] heart disease, [and those with] diabetes—be hospitalized. So almost no one else [fell into that category], even those with exposures, even those with travel, and even those with symptoms that fit classically. And as I'm talking to people, they fit the classical diagnostic criteria, right? So what I realized right away is that if 30% of the people of my population are testing positive, the numbers that we're seeing don't even come close to reflecting the real numbers—not even close. And everybody knows this by now, but I want

people to understand how bad the testing state is. I'm guessing it's 100 or more times the amount we're seeing in the numbers in the graphs and the charts of people that are affected, which means the death rate is lower. Some of the stuff is different than we actually see. So what are your thoughts on that?

Chad Prusmack 24:23

Yes, Jill. Look, I'm not an epidemiologist. I'm not an infectious disease doctor. I'm a smart guy trying to do good, just like you are. The numbers in that domain matter on a political level. It does, I think, affect us when you look at: What is the contagion coefficient? How do we understand how this thing spreads? That number is pertinent. But you asked the question—yes, I think that this is not as infectious as measles. This is more infectious than influenza. It's debatable whether it's got a higher death rate. But one of the things I think people should look at is why one person is getting sick and dying and not the other. So going back to this again, Jill, I think about this, and I love knowing the statistics. That John Hopkins map is phenomenal. It's a great web page; in one step, you can learn all about it. But when you look down into the dirt and say: "Wow, we have two people living together, one's positive and one's not" and "this person has a diarrheal illness and they test positive and this person is sick as heck, and test negative; we have to understand its behavior." And my opinion is that we don't know what this thing is. It will be something different than what we think it is once we figure it out. And as you know, this is more like a hypoxia-malarial issue than it is a pneumonia. So I think we're going to be extremely interested in what these risk factors are because I think they will be different than what we think they are now.

Dr. Jill 26:31

Oh, thanks for that. And one thing Chad is referring to—if you haven't seen the blog that came out today, it's kind of controversial. I wrote that. It's on my website—just jillcarnahan.com. Go there, look at the blog, and it's all about this hypoxia hypothesis. We won't spend a lot of time on that, but it's interesting because I think that it presents very differently from a classic ARDS. It actually presents more like pure hypoxia or even altitude sickness. We're seeing the lung appearances and some of the criteria fit more with a different model. It doesn't mean it's that disease; it just means it's acting not like a classical pneumonia, and that just makes us think more about what else we can do to treat it. So let's talk, Chad, about what you're doing with testing, because that's one of the big things I wanted to cover tonight. I want to let people know, number one, what you're doing and what you're finding out so far, statistic-wise. Tell me just a little bit about the testing that you're doing and some of the stuff that you're finding out.

Chad Prusmack 27:26

Sure, I'd love to, Jill. First, I'm going to make a comment on your post today. Jill has an unbelievable newsletter, and again, it puts together these narratives which are digestible, important, and actually actionable. So I'm reading the title back because I think everyone should look for it. It's called the "Emerging Theories That May Help Us Solve the COVID-19 Puzzle". I think that's the most eloquent. I think I spoke too long because if I had just said that, you would have known what I meant. But I think you captured everything just great in there, and it's a well-written article, and I found it very educational. So thank you for that.

Chad Prusmack 28:17

So the testing piece. The problem is the test—that's the reverse transcriptase PCR test. That test takes a picture and finds the actual virus. [It's] critically important. When we see someone pop a positive PCR in a Lyme's [disease] test, we get all excited because, you know: "That's it! This isn't smoke and mirrors anymore." It really gives you the fact that the patient has it. So in a highly symptomatic population, a positive test confirms the diagnosis. The problem with that test is that it runs, I think, a 30% or 40% false-negative rate, so you're going to miss almost one in three. Now, if you're asymptomatic, the likelihood of it being a false negative is less, and if you are symptomatic, the likelihood of it being positive is higher. I say that because it's looking at a very sick population where, if you're going to bet your money, "they have it." The problem is, that's where we get most of our information, so it trickles down from there. The problem is that testing in our population is potentially irrelevant because the window with which one may be able to test this in the carrier may be such a short window, [or] it may be long. It may represent transmissibility or not. But if one in three is going to be negative, and it depends upon whether you're telling someone, "You're infectious" or "not," it's not a very helpful test for us out on this part of the war.

Chad Prusmack 30:00

We were in a study looking at a serology test. These serology tests look at the shadows of the virus in the body. It looks at the body's response. Why is that helpful? Well, it's helpful because it gives a timeline, a magnitude potentially, and a pattern. Because there are different antibodies and they all come out to play and fight at a different time, one can say that this is a part of the disease; one has never been exposed, is currently exposed and infectious and symptomatic, [or] has a past exposure. You get a better idea, and you can fit those clinical vignettes into discussing their whole background, their story. Then you see, "Here's the pattern." Here's a pattern of young females who are IgM positive don't get symptomatic. Is

that true? Yes or no? And then we can do something with that. We can give information and safety. And this is all under the understanding that we don't know—[neither] you nor me—everything about the virus and have to be very cautious. But you and I have to make decisions on what to tell people right now without that. So go into war with the army that you have, and with this army, this serology test, I think, will give us better context and hopefully lead to immune passports where we could say: "You've had the virus. You're not infectious. You can go back to work and you can donate blood to potentially save someone's life."

Dr. Jill 31:51

Yes. Gosh, that's fantastic because it really gives an answer to part of the problem of "When do we open up the economy again? When do we let people go back to work?" What are you seeing with the results so far? Tell me more about any patterns and interesting things that maybe you didn't expect to see.

Chad Prusmack 32:08

I didn't know what to expect. We've done 72 tests. Again, disclosure: [They are] not FDA-approved yet. We are in a trial. The sensitivity of this test has been about 95%—specificity around 98%. We've done 72 tests, and 57 have resulted [in] 20 positives and 37 negatives. In general, one specific responder that is very interesting, there is a responder to the early immunoglobulin. So IgM seems to be one, asymptomatic or minimally symptomatic and less infectious. We have people that we know who had a social gathering where someone got sick. They've been quarantined, everyone's social distancing, and they come in for the test. [They] never had a sniffle, and they have all of the early responders—the IgM positive. So then you're like: "Well, this doesn't make any sense. They don't have any symptoms. Why do they have anything?" And then you test them 10 days later, and it's the same. So we have about four patients who are asymptomatic early responders, the IgMs, and they're not false negatives or positives. So that's a very interesting population. People that have lived with some of these, so the significant others, have come up negative. So it seems like: Here's an exposure, IgM positive, asymptomatic, and even though they're with their significant other quarantined for long periods of time, the partner doesn't get sick or develop antibodies.

Dr. Jill 33:57

Interesting. It makes you wonder. Again, like you said in the beginning, the big question—which I think will come out of this in the end as we look back; we're going to have more clarity—is what is the factor that keeps someone from getting this? Is it the immune system? Is it a toxic load? Is it blood type? I mean, I'm just throwing these random things out there, but there are probably things we don't even know

yet that affect [a person]. And then, if some of the hemoglobin stuff I wrote about is correct, maybe it's "thalassemia is protective," or maybe it's "hemochromatosis is not protective," or who knows, right?

Chad Prusmack 34:28

Yes. I mean, at the end of the day, oxygen dynamics and the role of the red blood cell, I think, are paramount, [as are] oxidation reactions around it. I think there's a gem in that biochemistry. I mean, you're like the world professional in this. What are your thoughts on this, Jill? I know I loved you talking about actionable items like vitamin C and zinc. What have you seen?

Dr. Jill 35:07

Well, Chad, that's one reason I wrote the article—not to say that I have the answers because I'm a simple functional medicine doctor in Boulder, Colorado. I do love mysteries, but I don't claim to know it all. Even in this article, I was very careful to say, "We're just in the middle; we're just theorizing." That's in the title because we really don't know. But what I wanted to say is, if this is true, do we reframe how we're looking at it? And I want to get people thinking because I remember medical school, it's like you get a diagnosis, an ICD-10, and you get a medication. You basically memorize this formulaic type of practice where you're [like]: "Here's the diagnosis, here's the medicine." "Here's the diagnosis, here's the medicine." We lose our ability to think outside the box, and creatively, and to really, really problem-solve, and that's what you and I love to do. So I love being in that place and trying to problem-solve with this virus and say, "What else are we missing?" Even in patients, when I get to the point where they're not getting better, my question to myself is always, "What else?" "What else?" "What else am I missing?" "What else are they not telling me?" "What else?" They don't even know. "What other pieces of the puzzle are we missing?" [I do the] same thing with this virus.

Dr. Jill 36:15

So the bottom line is if some of this stuff with hypoxia relating to oxygenation of the blood is true, and that maybe there's more than one mechanism happening with the virus, especially what I mentioned with the iron oxidation so when these iron molecules are released from the heme and they lose their oxygen carrying capacity, I equated it to like a raft that has been blown to smithereens and the iron [molecules] are like these guys that were on the raft that flew out into the water. And those iron [molecules] are really disruptive; they're like the brawlers at the bar or whatever, and they cause a lot of damage to the tissues. So when these irons get thrown off the raft, they are floundering in the water and causing damage. If that theory is true, then things that neutralize reactive oxygen from the iron [in the

body] are going to work. And what we do know to be true is that the success of things like IV vitamin C or liposomal [vitamin] C to keep up the intracellular level of vitamin C is very effective. I mean, the studies in China showed this. They're now using it in trials in New York City. I don't know where else they're doing it, but we're starting to see that there is some power to that, and it's so safe.

Dr. Jill 37:18

So the better thing even about some of these things that I'm presenting is not only are they effective but [also] quite safe. Other things that may have potential are nebulized glutathione because you get that antioxidant effect right to the tissues where you need it most. It's basically like a breathing treatment like an asthmatic would do, but instead of putting albuterol for breathing into the machine, you put glutathione into the machine. This is by prescription. All of these things are not typically done by patients on their own, but your doctor can prescribe those things, and you can nebulize glutathione.

Dr. Jill 37:48

Another thing I'm interested in—I don't have the data, but the data supports decreasing reactive oxygen pretty profoundly, and the studies are many—is inhaled hydrogen. This is a machine. I have one at the office. Some other doctors have them. I would love to, in the near future, be able to give treatments to patients where you just sit with a nasal prong and breathe in hydrogen ions into your lungs, and the hydrogen mixes with reactive oxygen and creates water. So it's a totally neutral byproduct, and in the process, you neutralize lots of these angry iron guys in your body. I'm not an expert on ozone. I'm not talking [about] IV ozone; I'm talking [about] just inhaled ozone in the nose. But my naturopath and many other doctors out there are experts, so I defer to you. But there's also an idea that perhaps ozone inhaled could be part of the treatment as well. So these are just a few things. And then, of course, all of this stuff around zinc, vitamin D, N-acetylcysteine, [and] potentially quercetin. There are a lot of different nutrients that are antioxidants and have potential. I really, really do believe these things are powerful in helping our patients, especially the ones that are not on the verge. Those who are on the verge of respiratory failure need to go to the hospital; they need the machines—there's nothing wrong with that. But what if we could keep the other 90% out of the hospital?

Chad Prusmack 39:06

Yes, Jill. When I hear you speak, your health is so important, meaning staying healthy and practicing the things that you're talking about. Maybe it turns out that the people who are getting sick, the young ones that are getting sick [who] are

unhealthy on the inside, they don't have vitamin C deficiencies or hemochromatosis, which is the high iron levels, or they have a gene which their oxidative stress is disproportionate, like a SOD mutation or something. Yes, I agree. It's so hard. And your hunches are always right, but you have these hunches, and you want to use this artillery, but you really can only use it one on one because, at the end of the day, we can be responsible for the people [inaudible]. But it's hard to be responsible for the world because, like you said, everyone's different, everyone's story is different, and their illness is different, and you've got to treat each one differently out here in the field.

Dr. Jill 40:14

Well, I love that you say that. The important thing about this is like what you and I do: We sit with one person, we listen carefully, we put the data together, and every plan is different. So when Dr. Chad and I create a plan, I don't have any protocols, so no one gets a one-size-fits-all [solution] because everybody's different. It's no different with the virus. So we're not claiming answers—it's just for individual patients—[but] some of these things may be helpful. So [with] testing, what do you think about the future of the testing that you're doing? Do you think this is part of the ability to get our economy out of this? What do you see this as future? Like, could we take this to all doctors' offices? What would you like to see with the testing?

Chad Prusmack 40:55

I think we need [to have] everyone serologically tested, and that would mean symptomatic, asymptomatic, and prior symptomatic. I just don't see a large-scale rationale on how we get back to work safely without having data or measurements that give me that reassurance—not the assurance, but the reassurance—that given your sickness in January, [when you had a] dry cough, loss of smell, shortness of breath, "I'm the sickest I've been in years," fatigue, [the sense of] smell comes back, "I feel better," and they have a serology test and everything's positive, and they're over 14 days out: Okay, this person is immune in my book [and] probably in many doctors' books. And if that test gets FDA approved and is accepted into the academic world, that person should get a passport, and that person should then go to the front line. And that front line could be a restaurant they work in, it could be a car wash, it could be a hospital. But until the recipient of that worker is assured to some degree that that person is safe and won't infect anyone else, I see this being the quickest and only way.

Chad Prusmack 42:28

It's always about data that couples with the story. That's why we have passports. "Hey, I'm Dr. Prusmack. I'm coming into your country." "Oh, yes, we trust you." That's why I have a passport [with] that data, so they can look at me and say, "Who is this character?" Hopefully, they don't find too many nefarious things in my past, and they let me into their country. It's the same way here. You and I swim in this very crazy, difficult world that medicine is. People die, and people are sick all the time. You hear about your complications, not your accolades, because your accolades go along their way, but your complications come back. It's a hard world. I feel authentically bad that it's just hard to explain. That's why this data is so important. It's so important to get that word out there, to get buy-in, and to make sure we're correct because I think that these passports are going to help save our society earlier.

Dr. Jill 43:31

Yes. Well, one of the reasons I brought you on tonight is that I want people to know who you are and what you're doing. So all of you who are listening, or if you listen to the recording later, please share, especially with physicians. I'm going to share [this] with my physician groups because I want people to know what Dr. Prusmack is doing. And if they're not doing it already, I think we can join forces in some of the data collection and in really making a difference because that's what it's going to take—it's at the ground level. We're so used to being so independent in the United States, and the reason why some of the different countries have had such success in decreasing the levels and getting people back into society is because they're much more of a community-minded country. We're all out for ourselves. Even our doctors' offices, everybody's independent, which is great, but now's the time to bind together and see if we can make a difference. Tell me this—last few minutes; we'll just close out in a few minutes here—what do you do personally to stay healthy? What's your protocol? What's your program? How do you stay healthy?

Chad Prusmack 44:32

Sure. So outside of the 30 bottles of supplements that I carry around in me. What's in them? Quercetin, fish oils, magnesium. N-acetylcysteine is probably what I rely on for detox. I take glutathione. I take a mineral complex. It jumps around. But when I look at my staples, it's kind of somewhere in that realm and methylated B vitamins because I have one of those SNPs for methylation. The other thing that I have full buy-in [for], and it was from you, is the use of binders. Again, I'm talking about my health, but the world is polluted. The best we can do is try to stay away from all these dirty things. Like you said, clean air, clean food, clean water, and a clean lifestyle. We always get dirty, no matter how clean we are. The binders, I find [to be] extraordinarily helpful. I find that they pick up what I couldn't pick up. If I'd

rather have had one too many drinks or whether I ate Taco Bell when I never do, I find those quite effective. I find those effective in my patients also. The glutathione things, the B vitamin things. Oh, curcumin is huge. I take a lot of curcumin, and exercise is supreme. If you were to ask me, "How do you stay alive?" Love those around you, work out like a demon, and then work hard and feel that you are authentically making a difference. Then all the supplements and stuff sort of fill in the gaps.

Dr. Jill 46:24

Oh, I love it. Oh, my gosh, from the pro.

Chad Prusmack 46:27

I don't know about that.

Dr. Jill 46:28

Gosh, I would say the same. And sleep is huge. I know not everybody has great sleep. It's difficult. It's hard to get. Sore subject!

Chad Prusmack 46:37

Yes, not my strong point.

Dr. Jill 46:39

No. I find, for me, that's my kryptonite. That is my secret weapon because I am a great sleeper. I maybe only get six and a half or seven [hours of sleep], but I'm getting like two and a half hours of deep [sleep] plus two hours of REM. I'm getting 97% efficiency. I fall asleep in, like, four minutes or less. Sorry to brag about that.

Chad Prusmack 46:57

I am jealous! You've got to put that wearable on you and track you.

Dr. Jill 47:02

Totally right. And I wanted to say [this] because I was a fiend for workouts too. And I love it, and I totally agree with you, especially in isolation, Chad. But just personally, what I found is I was overtraining and I didn't even know it. Last year when I really pulled all the way back and realized that my cortisol was sabotaging [my body], I lost 8% body fat. I always joke: "I stopped working out and got in the best shape of

my life." The truth is, I still lift. I still have a pull-up bar behind me. I could do 20 pull-ups. I'm still really strong, and I do work out, but it's not like I used to with the intensity. For me personally, as a woman in my 40s, it really worked well because that high cortisol was sabotaging me. Again, not everybody. Some people do great with Orangetheory or high-intensity interval training. Both of us love the Blood Flow Restriction bands—that's a whole other topic. But all that to say, [do] whatever works for you. But in this time, whatever you can do to decrease stress is key too.

Chad Prusmack 47:58

Agreed, and exercise being one of them. You brought up a great point. One was the overtraining principle. What a lot of people don't understand is that strength and conditioning is an academic science. It's not to the rigor of medicine, but there is a rationale to set goals, to test, and then train and program people so that they never do get over-trained and they don't have their cortisol levels go up, their IL-6 levels go up, their IgA go down. You can allocate the right metabolic stress that that unique person needs to achieve their goals in the absence of... One of the things that we do great at the Resilience Code is integrate this strength and conditioning rehab and integrative medicine. What we do is test, program, and try to reach a goal. If a goal is not achieved, regroup, and reprogram. But you've got to track it. You can't measure it, and you can't manage it if you don't know what someone wants. I love working out, I love kickboxing, and I love doing high-intensity interval training. But at the end of the day, when you don't know what you've done over the long term [and] just feel good every day, that, to me, is not making long-term progress toward longevity. That's doing the right thing in the moment, and I just think that exercise is really underappreciated, and the science of exercise is underappreciated.

Dr. Jill 49:24

I love that, Chad, because had you tracked me, you probably could have saved me all those years of [inaudible] [laughing]. It's like, I didn't even know it.

Chad Prusmack 49:29

[Laughing] Yes. [inaudible] work so hard. [Inaudible].

Dr. Jill 49:34

I know, right? Oh, gosh. I just got a few questions. I know one particular listener, I won't call out her name, she just got the test that you run, and she came back with two antibodies to proteins to IgA and two to IgM. She's asymptomatic, [but] she does feel like she had symptoms three weeks ago. In the collection of your data,

would you say she's one of those asymptomatic [individuals who] probably had it [and is] probably no longer contagious? She had quarantined for a full 14 days. Again, two IgM proteins, two IgA [proteins], and even though the IgM is still high, maybe retest her in 30 to 60 days?

Chad Prusmack 50:06

This is a great case. First, you have to make a decision. If I didn't have the test, what would I be telling the person? She doesn't need to go to the hospital. You take a detailed history—you listen. "When was your last symptom?" "Two weeks ago or more." If it was, then clinically, she would be over the virus, given that she had symptoms that were very likely and that the exposures would be. Yes, the next step is: Retest in 10 days or more; 14 would be preferable. The reality is 14 days for science, but we want to see if she converts from IgM to IgG. I'm getting the feeling, and again, this is just my observation, that there's a subgroup that does not convert, and they're the asymptomatic ones like this patient.

Chad Prusmack 51:02

Now, [with] the IgA issues, I've seen diarrhea and sinus. So the IgAs—again, this is a feeling, a sense, not hardcore science—is the sore throat, fever, sinus, "never thought I had it," IgA. Or fevers, chills, maybe a cough, and some gut problems, IgA. That's just what I've seen, and I think that's important. What's important also is that this presents [itself] in so many different ways because we have so many positives. If you asked me to take a test and you had a positive, I'd be like, "Oh, that doesn't sound like COVID." Well, we out here don't know what COVID is, and we're just learning. So you've got to take every illness seriously, document the last and first day you've had symptoms, and know that just to be on the safe side if it is that [way for] at least 14 days, don't be near anyone high risk, and always practice the safe practices—social distancing, hand-washing, etc.

Dr. Jill 52:02

Okay, this is super helpful. One of the doctors who's listening is asking: What test? Could they collaborate [and] collect data? Do you want to share the specific test? Do you want doctors to know how they could collaborate with you? It's up to you. How much do you want to share here?

Chad Prusmack 52:16

Yes. I mean, I have no disclosures or financial interests in any of these companies. We're using and working with Vibrant. The choice was made based off of prior

experience. They have four markers; that makes it more specific, as you know, Jill. So instead of just one, it's all of them. So it was that: More information. It looks like a high-resolution test. We're about to look at the exact numbers of the titers. So answer one is that we use that. More data is better. I'm not saying this is right or the only one, nor am I partial. I think we need to get these in everyone's hands. Yes, we're trying to work with companies and universities to help collect all this data and make some sense of it. We have a discussion with one of the local universities, to collaborate tomorrow, and [with] another private company. But I would recommend that doctors go out there, get the test, and demand it. Disclose to your patients: This isn't FDA approved. I'm doing my best, but we've got to work as a team, and I want to do no harm first. But I want to play some offense. You can't play defense the entire game. I guess if you had Von Miller, you would, but the fact is, we've got to get our Peyton Manning going and punch this thing back. And I think our best way is to figure out what that wily virus is doing. I would just enable any doctor to collaborate to help people and to get people to donate blood. I think that would be it.

Dr. Jill 54:11

So I'm going to ask some questions about stuff people are wanting to know. And again, you can answer or not answer—whatever is appropriate. First of all, if a patient is listening and they want to get tested, can they go to your facility? Or is that only your patients? Or where would you recommend [they go]? [That] they contact their doctor?

Chad Prusmack 54:28

Go to your doctor first. I'm happy to talk to those doctors. But yes, we are testing at the Resilience Code. Right now, we're on a trial basis. Hopefully, this will be FDA-approved soon. And then, collectively as a society, doctors and patients alike, we all should get together and agree on the safety of these things and how we consult them on what to do. But yes, we do the test now. We do it five days a week. Our goal is to get people safer quicker by delivering more data and information to them and to people smarter than me in this area.

Dr. Jill 55:13

I love it. And then, if doctors are interested, is there someone on your team they could contact?—because I think I want to share this with my colleagues and my doctors more than anything. So if there is any collaboration, is there a team member [that they can contact]? This is for physicians only, but who would they contact to collect data with you?

Chad Prusmack 55:30

Yes. Andrea Beaver—she's our Chief Navigational Officer. She is the one who is helping organize all the different blood draws. We all use masks and safe practices. We take in data. She would be the go-to contact person. And you can find at least our phone number on our website, which is www.myresiliencecode.com.

Dr. Jill 56:01

Awesome. I'll be sure and share that link so that if you scroll through the comments, you can see it. Awesome! Dr. Prusmack, this has been so fun! We always have fun together. Hopefully, [for] you guys listening, we've answered your questions. If you liked this, please share. I did this just because I don't want to give the testing out; I want people to know what Dr. Prusmack is doing. He's quiet, and for a neurosurgeon, he's very humble.

Chad Prusmack 56:23

Thanks.

Dr. Jill 56:25

I just had to say that because you really are one of the nicest, [most] humble guys I've met, and you're a neurosurgeon. I'm like, "What's up with that?"

Chad Prusmack 56:32

Thank you. Thank you. And thank you so much for having me, Jill. I just want to let you know again what a blessing you are to my health [by] being my doctor and also [for] revolutionizing this field. So just thank you for having me on.

Dr. Jill 56:46

Thank you. Thank you, guys, for listening. Like I said, please share and add your comments. I'll come back and answer those. Have a great evening. Good night.

Chad Prusmack 56:53

Good night.