THE FATIGUE SUPER CONFERENCE

The science of Chronic Fatigue Syndrome

Guest: Dr. Todd Born

Alex:Welcome to the Fatigue Super Conference. I think this is going to be a really important interview. I'm talking with Dr. Todd Born and we're going to be exploring really some of the context and the background of chronic fatigue syndrome. We're going to be looking at things like diagnostic criteria, some of the signs and symptoms people experience, some of the difficulties in getting a clear diagnosis. We're also going to use that as a pathway to explore some of the treatments and interventions that can be effective. Firstly, welcome Todd. Thank you so much for being with me.

Dr. Todd Born:Sure. Thank you, Alex. Appreciate it.

Alex:Let me just give people your full background and then we'll jump in. Dr. Born is a naturopathic physician and certified nutrition specialist. He is co-owner and medical director of Born Institute of Medicine Specialists, LLC. Dr. Born is a products manager, head of new product development, scientific advisor for Allergy Research Group, who is one of the sponsors of this conference and is editor in chief of their science based Focus Newsletter.

Alex:Dr. Born is also lead advisor and president of the International Society for Naturopathic Medicine as well as a medical wellness advisor for the International Medical Wellness Association. Dr. Born graduated from Bastyr University in Seattle and completed his residency at the Bastyr Center for Natural Health and its 13 teaching clinics. With rotations at Evergreen, Harborview Medical Centers' emergency medicine departments and Virginia Mason Hospital's department of physical medicine and rehabilitation Spine Clinic.

Alex:He's been published in Naturopathic Doctor News and Reviews, Townsend Letter, Integrative Medicine Alert, Natural Medicine Journal, Holistic Primary Care and the Natural Nutmeg. He has appeared on, is that KRON 4 or KRON 4 news?

Dr. Todd Born:KRON 4.

Alex:Radio shows and lectured as an expert for the National Psoriasis Foundation and Arthritis Foundation, has also lectured around the country and internationally at various medical conferences.

Alex:Dr. Born's clinical focus is utilizing integrative medicine to treat chronic disease. He has a strong interest in difficult and refractory cases, allergies, gastrointestinal issues, neurological and neurodegenerative disorders, endocrinology, cardiovascular disease and diabetes, autoimmune disease, development and behavior issues, HIV, AIDS and geriatrics, otherwise known as you have a lot of interests and you're working very, very hard.

Alex:Thank you so much for making some time to talk with me. As I was saying at the start, we're giving you a bit of a context and background in terms of these conditions. Maybe just a starting point before we jump in, I guess I'm just curious a little bit around what got you interested in working with such challenging, complicated areas? You could have picked an easier life for yourself so I'm curious as to what drove that?

Dr. Todd Born:That's a good question and thanks again, Alex, for putting this conference together. I think it's really needed because fatigue is a really nebulous diagnosis and there's so many underlying causes of fatigue. I think it's actually poorly addressed unless an organic cause is found, right? "Oh, you have iron deficiency, anemia, let's just treat that. The symptoms go away."

Dr. Todd Born:For me in my practice is that a lot of doctors or MDs may specialize and say, "I'm the autoimmune expert," but for me I just liked the idea of say a family practice and not knowing what's going to come to the door and seeing a lot of different cases every day. It was just much more interesting to me and also rewarding in the fact that when you have these patients who are very, very sick for a very long time, and almost all patients are usually referred to me by a family or friend or even another doctor in the community.

Dr. Todd Born:It's just very rewarding to see someone who comes in with rheumatoid arthritis and their hands are all gnarled up to be able ... and they have no quality of life and they're 40 years old, they've got nothing, they can't even play with their kids, to be able to say, "I can help you and there's a lot of things we can do that aren't overwhelming. I just like the fact of doing a lot of different things and being very eclectic and seeing a lot of different patients with a lot of very complicated diseases. I like the puzzle. Let me just put it that way.

Alex:It's funny you say that. At the The Optimum Health Clinic, that's exactly the analogy we use to the point that our logo is pieces of a puzzle. I love that you said that. That's absolutely how we see it.

Alex:Maybe to jump in a bit, let's open it up with some of the diagnostic criteria. One of the enormous challenges with this group of conditions can be just getting clarity in terms of diagnosis. There's obviously varying opinions. There's different diagnostic criteria. Maybe say a little bit about how, as a physician, as a practitioner, how do you go about getting clarity in terms of diagnosing people? What's the methodology you use for that?

Dr. Todd Born:Sure. I'll switch to a screen share so you can see, have a better visual of what's going on. First there's different terminology because I think you're probably going to have listeners from all over the world. In the United States, it's chronic fatigue syndrome. In the UK, myalgic encephalomyelitis. From the Mayo Clinic, this very large, prestigious institution in the United States, they actually want it to be called chronic multifactorial fatigue.

Dr. Todd Born:The Institute of Medicine, which is similar to the World Health Organization, it's an independent body ... In 2015 they said none of those really actually do a good job describing what this syndrome is. What is a syndrome? A syndrome is nothing more than a constellation of symptoms and then you just get lumped into something. We don't really have a full definition or etiology of it. They actually redefined it to be much more indicative of what the signs and symptoms of the disease is. They want it to be called systemic exertion and intolerance disease or SEID.

Dr. Todd Born:But for simplicity and the fact that most people are not aware of that mouthful, we'll just call it CFS and chronic fatigue throughout our discussions here. There actually is different diagnostic criteria. I don't know how it works in other parts of the world, but United States we like to make things more complicated, I think.

Dr. Todd Born:It really depends on who, what academy, what governing body you're following to meet a criteria. I like the IOM because they're independent and they're very thorough and they try to be as unbiased as possible. What they say for chronic fatigue syndrome is that you actually have to have a substantial reduction or impairment in the ability to engage in your pre-illness levels of life.

Dr. Todd Born:You were going about your day and then all of a sudden now you have these symptoms. You also have to have post-exertional malaise. These are people when they exercise it's not your normal, "Oh, I got some muscle fatigue after I exercise." These people are wiped out. You also have to have un-refreshing sleep. Those have to have all three.

Dr. Todd Born:Then, you also need one of two other manifestations, either some type of cognitive impairment or an orthostatic intolerance. That could be

anywhere from you basically bend over and you get back up and you get lightheaded which happens a lot of the times to normal people. But, people with chronic fatigue syndrome, happens all the time to the point also where they can have syncope and just faint. The other thing is that their heart rate goes up, those kind of things.

Dr. Todd Born:And then the key to not only having the three mandatory pieces but then either cognitive improvement or some kind of hypotensive issue is that it has to have happened for at least six months straight and it has to be moderate or substantial impact on your life of severity. It can't just be, "Well, this has been going on for a few months and it kind of moderately affects my life." That does not mean that someone can actually meet that criteria.

Alex:I think one of the challenges, of course, at this point is that because there is not a biomarker, which is being used effectively, it's a diagnosis of exclusion, that you're being clear that it's not other factors and someone meets these symptoms. That's part of the reason why they're seeing such a variance sometimes with people's ability to accurately diagnose.

Dr. Todd Born:That's exactly correct. It's a diagnostic conundrum because in and of itself the individuals are essentially normal. They appear normal. Their biomarkers are normal. The physical exam is normal. Everything seems to be normal in these individuals but yet you look at the person in front of you and they feel terrible. They look terrible. They feel terrible. They act terrible. But yet their laboratory results are typically normal. Diagnostic imaging is normal. Everything is normal. They say that they feel like they have a fever, but yet they're afebrile when you take their temperature or even they take their temperature.

Dr. Todd Born:The only thing that has been able to be elucidated is really in research studies looking at some inflammatory cytokines, which we'll discuss later and actually when you biopsy their cervical lymph nodes, there's some increase in the number of cells of hyperplasia, but that's it. Those are the only real manifestations that we can discover thus far.

Alex:Certainly, our perspective, and I'll be curious as to your thoughts around this, that part of the challenge here is that we are effectively dealing with a number of different subgroups or a bunch of different things happening in different people and that recognition and definition of subgroups becomes an important way of actually being able to say, "Well, that this group of people, we might be able to find a biomarker around mitochondrial function. For this group of people, we might be able to find some kind of grouping or cluster that have issues with hormones, or for this group, we might have an inflammation

group." It isn't necessarily that everyone that's affected by these syndromes has the same factors in terms of what's going on.

Dr. Todd Born:That's correct, except for when we get into things like the Centers For Disease Control or the Institute of Medicine. They're like, "We may have all of these disparate symptoms and no two people with CFS may present the same. At least they're going to have some similarities." So the CDC kind of goes a little step further than the Institute of Medicine, besides the increased malaise and fatigue. They also say that there's going to be persistent muscle pain. They are going to have joint pain, but yet no redness or swelling, they all have headaches. It doesn't mean all of these. These are just the most common manifestations seen.

Dr. Todd Born:This is where I see a lot. The cervical and axillary tender lymph nodes, the sore throat that comes and goes, the fever that comes and goes, the difficulties of memory and concentration. What I also see a lot is they always say the same thing. They are exhausted all the time and nothing really seems to make a difference. They're like, "I'm drinking two pots of coffee a day and I could sleep holding a cup of coffee. I'm taking bags of supplements. I don't feel any different." We're going to talk about why.

Dr. Todd Born:That's why it's so crucial for the clinician who sees someone who doesn't have say the diagnosis yet and they're coming to you and try to find out what's going on is to just sit and listen to them and do a thorough history and physical exam so you can actually catch all these pieces instead of just getting ready to push them aside and being like, "Well, you just need to sleep some more or get a new job or it's all in your head," because we know now that it's not all in people's heads and we'll talk about that here in a little bit.

Alex:Should we dive a bit more into some of the aetiology about this, because I think just getting a sense of some of the different groups and catch phrases is a helpful way of understanding it. I think one of the misconceptions people can have is that it only happens ... Some people see a lot of it happening in teenagers, for example and there can be a perception that this is something that just happens to young people or just happens to females, for example. But yeah, maybe just run us through a little bit some of the data around this.

Dr. Todd Born:Sure. The data always depends on where you are in the world and which group of diagnostic criteria. The numbers get really complicated, but for me, I like to simplify things and depending which case definition you're using, we can just the Institute of Medicine, who has a little bit stricter definition. They say that there's anywhere between 775 to 6300 cases per 100,000 or that roughly translates to, in the United States, anywhere between

.3% and 2.5% of people have ... They meet the definition, doesn't mean they've been diagnosed. The prevalence worldwide seems to be around 10%, so that's a lot of people. There's seven billion people in the world and they're saying there's about a 10% prevalence. That's who's been diagnosed.

Dr. Todd Born:What about all those people walking around who don't have the diagnoses. They haven't been accurately been able to diagnose, they haven't been treated. They're the guy that doesn't feel like going to the doctor unless his arm is falling off. That's the way it is. It is about 75% female as least as far as diagnosis and it mostly affects young to the middle age. Young is again kind of a nebulous thing, but I would for me it tends to be ... In my practice, which maybe I've seen about 200 cases or so, so not as much as what comes through your clinics, since you're a specialty clinic, but I would say it tends to be in the mid-20s, but most of the people I'm seeing with this, they're early 40s.

Dr. Todd Born:It's probably the fact that they had it in their 30s. They just powered through until it brought them to the point of seeking professional help and they're like, "Look, I can't even function anymore. I'm about ready to lose my job and go on disability. I'm out of sick days. Something needs to take affect here."

Alex:Certainly, my observation would be that certainly that the data seems relatively accurate in terms of the clusters, but it's also worth saying we've had patients ... I think the youngest that we've had involvement with has been eight, nine, ten. Obviously, in this cases, it's super tricky because it's hard to really get a sense of what may be psycho-emotional versus what's physical. There's all kinds of complexities, but up until I have ... In fact, one of the patrons of our charity is Shirley Conran, who is in her 80s. That's a kind of enormously broad range in terms of ages. There definitely seem to be certain clusters and it's good that you share that in the data. Maybe say a bit more about the signs and symptoms, some of the different ways it can manifest for people.

Dr. Todd Born:Sure, I mean the signs and symptoms tend to be kind of all over the place. I'm going to share my screen with you so you'll be able to see it to better ... It has to be a sudden onset and this is classic and people will say, "I was a normal functioning individual." Usually, in my experience, and the data shows this in research papers, that they got an illness, whether it's bacterial or viral, then all the sudden, since then ... It's different than the usual post infections malaise and fatigue that you would see after someone has an infection.

Dr. Todd Born:This does not resolve. It gets worse. It's overwhelming and then usually altered sleep and cognition. I have a lot of patients with CFS, they have hypersomnia. They sleep too much. They sleep 12 hours a day. They don't wake refreshed and they're sleeping all weekend and they still feel like they could sleep more. There's also excessive physical activity, which exacerbates it. I wouldn't even put it as excessive. It's that these are people that usually that say, "I go for a walk around the block and I'm fine, but if I take even a half a block more, and it's not even a steep street I live on, I am wiped out for two days."

Dr. Todd Born:We're talking pretty mild exercise can completely deplete these people. Usually, they present as they were high functioning, totally normal, doing their every day business and then they got the whammy. A lot of them don't have a progression as far as when you take their history. They're like, "No, I was fine. This happened to me and then it's been downhill ever since. It wasn't even like a progression." I have a couple papers here that kind of show what substantiates those pieces.

Dr. Todd Born:Then the actual underlying ideologies, which we'll get to a little bit later helps pinpoint where those signs and symptoms, so if they present, like you said earlier, if they present with these things, it's more likely that they're going to have this causation, if they present with these. That's where the important history and physical exam come in.

Alex:I know your next slide is on diagnostic challenges and we touched on that, but it's worth saying a bit more about some of the ... Yeah, some of the challenges and just getting a clear diagnosis from people. I appreciate the Harry Potter picture there.

Dr. Todd Born:I know. I was trying to find someone who was looking confused and I couldn't find anything good and I was like, "This actually looks like my son when you tell him he can't do something." I just decided to use the Harry Potter. You're right, it's that the patient presents to your office and now they have an infection that's resolved. Physical exam is normal for the doctor. They say that they have fever, but they're usually completely normal. They have joint pain, but there's no swelling, there's no redness and their range of motion is normal. They have fatigued muscles but only their report. When the doctor goes and we do muscle grading tests or DTRs, those are normal.

Dr. Todd Born:Cervical and axial lymph nodes are normal, but they say that they're not. All of these is because when they present, in my experience, it's because when they present to the office is that they're not in one of their flairs. When they're at home of if they can get into the office when they're in one of their waxing and waning symptoms, if the underlying etiology is let's say an

infectious agent, then when they come in, they will have pharyngitis. They will have lymphedema, where it's painful.

Dr. Todd Born:It depends where they are in in their syndrome and what the underlying etiologies are, whether we're going to be able to discover it or not. Then it comes to labs, right? Labs are almost always normal. 5% of cases, they might be abnormal, which means you might uncover iron deficiency, anemia or maybe some low testosterone or something that is tell you why they're so fatigued. Like you said-

Alex:Quite often, those labs that come back with something abnormal can also be red herrings, right? You get somebody that comes and you discover and you think, "Oh, this must be it," and you go and investigate it and find resolution it doesn't always necessarily impact the underlying fatigue that's going.

Dr. Todd Born:That's right. You'll someone that's like, "Oh, you've got pretty decent hypothyroidism. Let's treat your thyroid." Thyroid normalized and they're like, "Yeah, I'm 10% better." You're exactly right is that ... Especially if they've been sick for a long time, it's the layers that need to be peeled way. For me, any in road I can make, I'm willing to do that. Most of them, they are partially completely disabled by manifestations, but the labs are normal, radiology imaging is normal. They have these patterns of remission and relapse. I really only see that in those that have an infectious etiology, not if they have underlying ones, like mold or something else.

Dr. Todd Born:They look normal, they appear normal, they feel terrible, and just listening to their stories usually very heartbreaking. Then if it's gone on long enough and their support system is not there. They're accused of being malingers, their family abandons them. They just call them liars, attention seekers, what have you and that just makes things worse, because now they just are like, "Well, maybe it is all in my head." They just go further down the rabbit hole.

Alex:It's just worth saying that there's a really strong I think correlation between this lack of clear biomarker or diagnostic process and the lack of understanding that we tend to get culturally. I think normally you have a normal medical condition let's say or a kind of you have cancer or MS or whatever it may be. You'll hopefully get a clear diagnosis and then there's a lot of emotional support will come from friends and family.

Alex:When there's this cultural question mark around what's happening with these conditions, that often also comes with a level of cynicism and skepticism

from the people that are most needed to be helpful and supportive. I think that can have its own quite negative impact in terms of people's outcomes.

Dr. Todd Born:That's right. It doesn't really matter what condition you have. Study after study shows that if you have a poor support network, your outcomes are worse. Say for a heart attack for example, studies show that if you have a myocardial infarction, that if you don't have a good support network, you are more likely to get a second infarc and you're more likely to die from that second cardiac arrest than you would if you have a support network. I think even conventional medicine now is starting to make more of that connect of the mind and the spirit and the emotional support versus before, everything was so reductionistic. It's like, "No, that has nothing to do with anything." Now, they're starting to say, "You know what? That isn't really the case."

Dr. Todd Born:That's another reason why I like these difficult to treat refractory cases. Sometimes, they're actually easier than other cases, because these people that come to me, they've been worked up six ways to Sunday. I just get their outside medical records. I just look at them and I just fill in a few gaps and I say, "This is what I think's going on now." They've already had everything done to them.

Dr. Todd Born:Chronic fatigue syndrome's one of them where usually conventional medicine doesn't have much to offer. It's frustrating for both the conventional practitioner and the patient, because they're like, "I saw my PCP and they say everything's fine. They don't know what to do." I'm like, "Well, I'm glad they sent you to me." The other thing would be looking at overlapping comorbidities between chronic fatigue syndrome and fibromyalgia. They usually go hand in hand, which makes sense. If someone is in chronic pain that has fibromyalgia, they're going to be tired all the time and end up with chronic fatigue syndrome. Is it like chicken or the egg kind of deal?

Alex:Again, it kind of goes back to this point around getting physicians that really have the depth and knowledge and understanding in terms of what's going on, because often what you'll see is someone that has fatigue with pain in a certain way, and they'll get lumped with fibromyalgia. Fatigue without pain will get the chronic fatigue diagnosis. Part of how I tend to think about it is these diagnoses aren't really diagnoses. They're just labels for a set of symptoms that people are experiencing. It isn't really telling us what's going on in terms of potential underlying causes.

Alex:That's one of the challenges that really getting underneath the label to actually what's the presentation of symptoms and what's the potential in that individual is crucial to getting closer to potential treatment. Yeah, maybe we

should say a bit about some of the aetiology side of it in terms of at least what the research is showing around that.

Dr. Todd Born:That's right. You're exactly right. The United States, anyway, that's the way ... I love conventional medicine and conventional doctors. I trained all along with them during residency and in hospitals is that in order for them to be able to treat, they have to have a diagnosis. If they don't have a diagnosis, they don't know how to really treat or what to do, which is one of the strengths of integrative, functional medicine, integrative medicine, naturopathic medicine. We don't need a diagnosis. We need to look at the person who's in front of us and the consolation of all their symptoms and then look at what's the actual underlying cause. That's why I believe functional medicine, naturopathic medicine, et cetera, it shines in some of these syndromes more than what conventional medicine has to offer. Because without your diagnosis, they're just like, "Oh, I don't really know. You have a syndrome and we can't find anything wrong with you. It's in your head."

Dr. Todd Born:Most doctors I think now have a kinder heart where they ... but their hands are tied. They don't have the training or the skill set to be able to figure it out, so hopefully they refer or they kind of send them to someone who does or they get more training themselves, but there is a big overlap between fibromyalgia and SCID or CFS. You're right, if they don't have the pain portion of it, they're just like, "Well, you just have chronic fatigue syndrome."

Dr. Todd Born:Now what I'm seeing a lot and maybe you guys as well in your clinic is stimulants being used, because that's the only thing they can treat. They're like, "You're tired? Well, let's give you some methylphenidate. Let's give you Adderall. Let's give you basically pharmaceutical speed to help you. Not against them, they're trying to help their patient. They're like, "You feel terrible and you're tired all the time, let's just give you some stuff to perk you up." You're robbing Peter to pay Paul.

Alex:Right, you're borrowing tomorrow's energy for today. That's how I think.

Dr. Todd Born:That's right. You're just basically going to burn out those adrenals even more, then push the thyroid even more, because the HPA axis. For me, I'm much more into why do you feel the way that you do? History and physical exam is where I start to really dig into what I think is going on. What we know of now as far as the science, we still don't know what the cause is or causes, but this is what we think is are cause or even causes, right? In medicine in humans ... Humans are very dynamic systems. It's usually not just one thing that cause something to go awry. There's virus and bacterial causes of these and Epstein-Barr, herpes simplex 6, and the list goes on and

on, tick borne illnesses, mycoplasma have all been associated with the onset of chronic fatigue syndrome. There's also this immune dysfunction and dysregulation compared to healthy controls.

Dr. Todd Born:At least now, if someone ever says, this is in your head, you can pull just this one paper, and there are many, as well as the CDC themselves that, "Look, we know there's an immune problem. You have decreased immune complexes, decreased natural killer cells, as well as their ability to be able to fight infection, altered immunoglobulin G levels and your CD4-CD8 ratios. They also show increased cytokine production, so inflammatory things are happening in the body that are not happening in those that have controls." You call them a malingerer all day, but labs don't lie. There might the laboratory errors, but labs don't lie.

Dr. Todd Born:You draw someone's blood and you run it, it is what it is, and that's the way I see it. The other piece would be we're now noticing endocrine metabolic dysfunction, which makes sense. That's where this POT syndrome, orthostatic intolerance comes in where normally all of us have a certain amount of physical and/or emotional stress every day, but in individuals with chronic fatigue syndrome, their barometer in tolerance for these perturbations are much smaller. What might stress you, **Alex**, or me out might not necessarily stress them out to the same degree or vice versa. We're like, "Oh, that's too bad. We're sitting in traffic." For these people, it could be a mild perturbation and it just wipes them out for days. We know that there is alternations in this hypothalamic pituitary axis and it's been shown in papers over and over, usually measuring hormone levels, cytokines and cell function.

Alex:Very cool. Do you want to continue, because I know you've got a few more in terms of the possible causes?

Dr. Todd Born:Yeah, so we're hit some more causes is that there's this neurally mediated hypotension…

Alex:I wanted you to say that one. Thank you.

Dr. Todd Born:I had to practice it a few times. Also known as POTS. I see this quite a bit with people. POTS is postural orthostatic tachycardia is normally your heart rate is steady and it is completely normal for someone to go from supine or laying down to sitting up or sitting down to sitting up for the blood pressure to drop slightly and your heart rate to go up a little bit, because of just pure gravity of your body pulling. That's a normal response. You don't even feel it. People with chronic fatigue syndrome, they feel it. They get light headed, they have visual dimming. Even when people are talking to me, they report like they feel like they're in a tunnel until they recover. They could

become tachycardic, where I've had patients where I do these tilt table test and their heart rate is say 80 and it might go to 110, 120 just by having them laying down and then sitting up.

Dr. Todd Born:Then you'll also see their systolic blood pressure drop more than 10 points. That is an abnormal response to a normal stimuli. We know something's going on. Again, those tests don't lie. The tilt table is actually quite a useful test for a doctor to utilize for their patients.

Alex:I think it's one of the areas certainly here in the UK over the last few years that I think certainly doctors are more up-to-date let's say in terms of their knowledge are getting better at identifying POTS and diagnosing POTS. Sometimes the more traditional medical interventions in terms of beta blockers and those kind of things can be helpful and there are certainly cases were people have had a significant improvement in symptoms through that.

Dr. Todd Born:That's right. But in our world, ours and yours and my world, is if you actually address the address the underlying causes, address the ... the adrenal gland is ... When we think of POTS just because your heart rate goes up, to regulate blood pressure, it's very, very involved, the lung has things that take over, your kidneys of a role, your adrenal gland has a role, the adrenal cortex and medulla. If you treat all those, particularly the adrenal gland and to get people's blood sugar stabilized, POTS usually resolves.

Dr. Todd Born:But you're right, sometimes you do need the bandaid to get things under control because the last thing you need is someone who basically faints and hits their head. Now you got a basically internal bleeding to worry about and chronic fatigue is the last of their concerns while they're off to the emergency room. There's a time and place for everything.

Alex:Yeah, and I think it's a great point that you make that dealing with the underlying piece is really the key. Certainly I've seen, as a note of caution, a number of cases over recent years. Although there is progress in terms of at least the medical world getting interested in pieces of it, but going back to what we were saying a bit earlier that you can have that 5% of cases where something abnormal does come back, but then it's kind of like all the hope goes into, "Oh my God. Well, I don't have chronic fatigue or I don't have fibromyalgia. I just have POTS and I just need to go down this path and I'll be fine." Often, it's not quite as simple as that. The longer term resolution, as you say, is to deal with the underlying factors, which are causing what really appears to me, as a non-medical expert, but it appears that POTS is really a set of symptoms for an underlying cause.

Dr. Todd Born:That's right, exactly. It's a body's way of showing you what's going on. That's not the cause of it. Something else is causing the POTS and because this is such a multisystem, multifactorial condition, to get people truly better, it all needs to be addressed. Sometimes, you have to just dig. We'll talk about at the end where I've even been led astray. I had one patient where she fortunately stayed with me for quite a while and I'll get into that case where I was doing everything and I'm like, "Man, she is just not responding. I don't know why." And then the light bulb moment went off a year and a half into it and then I did find the underlying cause and then she was fine. We'll talk about that.

Alex:That's the cases where practitioners grow, right? It's like going to the gym and lifting weights is the one that really structures the muscle and that's the one where we get better in what we do.

Dr. Todd Born:That's right. Especially when you first get out, because medical school's only so long, residency's only so long and then all the sudden, you get thrown into the baptism by fire. It's unfortunate the patients have to come across your path to make those mistakes, but that's what gets you to grow and learn and then things can start becoming predictable. Even when I was in the emergency department, I was rotating with some of these attendings that were doing it for so long, they could tell you what was going on without really good much, because they'd just seen so many times these men and women. They're just like, "This person has this. And I guarantee you. Watch when I do this."

Dr. Todd Born:It was really fascinating, but they don't really see chronic fatigue syndrome, so it's a little more predictable in the ER sometimes. The other thing would be I should probably change this part of my slide deck where I have, as an etiology this neuropsychiatric factors. The studies show that two-thirds of the people or more actually meet the criteria, but it's chicken or the egg. Is it the person has CFS, which without their support or even if they do have support, they're not getting better. Is that what's making them have some kind of depressive disorder or anxiety disorder? Or is those conditions that's causing them to have that.

Dr. Todd Born:I don't think it's really an etiology. I just think it happens to be a comorbidity. It just comes with the condition that even as positive as they are, if you're sick for a really long time, it's really hard to remain positive. Some of the medications you may be getting put on or some of the things you're given might cause some of these. I have more than 50% of my CFS over the years have no psychosocial disorders whatsoever. They're like, "Yeah, I feel blue that I'm not getting better and I feel disappointed," but they don't meet

any criteria for DSM 5 diagnosis for anything, so I should probably change that out, so note to self.

Dr. Todd Born:The other thing would be genetics. This is what we see a lot that there's this apt saying in medicine that genetics loads the gun, environment pulls the trigger. Someone usually has to have some type of genetic predisposition for a particular condition. We see this in autoimmune disease. We could it in a lot of chronic disease where for example, why would patient X get exposed to an infectious agent and recover and why would patient B get the same agent, go through the same things, but yet they end up with chronic fatigue syndrome?

Dr. Todd Born:It usually is a mix of genetics and epigenetics that kind of make it for someone to have a stimuli that sends them down this other path where someone else basically responds. We have studies in my slide deck if you care to see them. Here's one where they show that just polymorphisms, just single nucleotide polymorphism, a slight change in your genetic code where the gene still works, just doesn't work at 100%, shows that people have unexplained chronic fatigue. Here's another study where it showed more polymorphisms show that you have these predictors of chronic fatigue, given certain snips. If you look at the snips with the [Copt 00:37:41] variance and some of these other ones, the neural tryptophan, they're not making amino acids correctly. They're not making neurotransmitter.

Dr. Todd Born:Here, they said that these, we talked about difficult predict, maybe some of these genes are run and we understand them in the light of the person in front of us. It actually has a 76% accuracy that someone has a livelihood of getting CFS, regardless of the insult, whether it's infectious or it's mold or it's heavy metals. That's big. I'm not a snip expert. I believe you talked to Dr. Ben Lynch. That's more his world.

Alex:Yeah.

Dr. Todd Born:But this is good evidence. One more etiology, which is actually a big news is mitochondrial dysfunction. These people actually ... It's not that the insult caused their mitochondria to dysfunction. They already had mitochondrial dysfunction, so this is where you'll see the patients that come through your door and they've got bags of supplements and they say that they're no better. They could be good quality supplements and they're taking really high doses.

Dr. Todd Born:Here's a study. The first one that showed that if you put in all of these substrates, it actually had to do with the mitochondria's ability to be able to take these substrates and still produce ATP. They couldn't, so one of

the roles then is to fix the mitochondria, help optimize people's genetic potential and then you can start giving them these nutrients and you'll actually get results.

Dr. Todd Born:One more would be metabolomics, right? The whole -omics thing has exploded. You got proteomics, pharmacogenomics. There's too many -omics. Metabolomics has to do with the body's ability of metabolites, whether it's something that you've ingested or even just normal part of every day human physiology and biochemistry, because metabolites can produce.

Dr. Todd Born:Here's a study in, let's see what is it, 55 individuals compared to healthy controls, where they did microbiome testing and they did a lot of fancy testing and they showed that people with CFS, compared to healthy controls, actually were in a hypometabolic state, so when they also try to perturb them to different environmental stressors, they actually had a slower response than controls. Again, back to this malingers and this disease being in someone's head is that this proves that it doesn't.

Dr. Todd Born:These people also had a lower production of certain vitamins, branch chain amino acids. Their mitochondria function was lower. All of them, compared to healthy controls, were actually worse off and 80% of the diagnostic metabolites were decreased in these individual compared to healthy controls.

Alex:I think part of what's really important about what you're sharing here is that it kind of goes back to what we were saying around with the traditional medical world diagnostic criteria, it's kind of there are no biomarkers. It's a diagnose of exclusion. There's nothing else we can find wrong with you. You have these symptoms. We're going to give you the label. The point that you're making here is that actually as we go deeper into some of the more functional testing, but also as we look at it from a slightly different lens in terms of rather than trying to find one thing across the whole population, that looking at some of the different subgroups and some of the different things that are going on, there is a whole different body of evidence starts to open up, which I think for people watching suffering from fatigue, I hope gives people some kind of reassurance about ... Although, of course, they know there's something's going on. Actually, there's real evidence that absolutely supports that.

Dr. Todd Born:That's right. Even for their clinician themselves to say, "Okay, there is something else that we can test." People in general, particularly clinicians, we're generally very empirical. We like numbers. We like information and I'm more information driven and I like numbers, mostly as a motivation factor to get people to be more adherent to the things that I'm suggestion. Also, because you could say, "Look, we do have some things ... " A

lot of these were in research institutions. Some of these tests may not even be commercially available, but the testing of the gut microbiome is very available. Doing nutrient testing is very available. Neurotransmitter testing is readily available, but not necessarily diagnostically accurate, because even if you're doing urinary metabolites and it's run through [HPLMC 00:42:30], which makes it more accurate ...

Dr. Todd Born:I've spoken to many functional neurologists about this is that those don't ... Catecholamines and the neurotransmitters you're testing in urine or organic acids don't necessarily reflect what's in the cerebral spinal fluid and what's in the brain. Still, it can give people good guidance. I don't do a whole lot of organic acid testing anymore or I don't do any neurotransmitter, but I know a lot of clinicians do, and they get very good results with them.

Dr. Todd Born:It's nice to know that the science now is supporting what people had been doing for a long time. We'll go through how a naturopathic approach and really my approach to these cases of trial and error and seeing a lot of people and talking to my mentors over the years and this is kind of what I've boiled it down to and this is the meat and potatoes of what people really want to know, I think.

Dr. Todd Born:For me, rule out all other etiologies of fatigue, hypothyroidism, sleep dysfunction, stress, but as you were saying earlier I've never seeing someone it was just one thing. It's never been, "Yup, you feel like this because it's your thyroid. You feel like this because it's low testosterone. You feel like this because it's iron deficiency anemia." It's nice when those do come up, because I'm like, "Cool, I know this is going to get them incrementally better each intervention I do, but I still hopefully have not a long road to go." Look at the comorbidities, so if someone has ... The more food they have on their plate, the more work there's to be done. If someone comes in and that they're only problem is they're just tired all the time. I'm like, "Well, that's cool. That's the only thing I have to deal with, that they think I have a chronic ..."

Dr. Todd Born:If they have chronic pain, if they're not sleeping well, they're in a toxic relationship, they've got ... That's usually who gets sent to me are these people that is that they're just a train wreck. They've been sick for 30 years, 20 years, and now they're like, "Look, you're my last hope. My PCP heard about you and they don't even know what you do, but they say you get some people better. Here I am. I don't even know what a naturopath is." That's kind of who ends up seeing me a lot of the times.

Dr. Todd Born:Psychiatric illness, I only had one patient that I can recall that he kind of met the CFS criteria, I would imagine, and he had some depression, but I think he had depression because he was so tired for so long. He was

taking 40 milligrams of Adderall a day, which is an astronomical amount of Adderall, right?

Alex:Wow.

Dr. Todd Born:Yeah, that's a bomb. It was just enough so he could go work at the tattoo parlor that he ... He was a tattoo artist. Then I started going down the road. I'm like, "Well, maybe it's just with all these chemicals." His was infectious, because he's like he got mono. I tested him and his EBV titers were off the charts and he did actually quite well. We did have to get him to see a counselor, because he'd been sick for so long, all the stuff I was doing, he was really starting to become suicidal, because he's just like, "I'm never going to get better, never going to get better." I'm like, "I need you to see a therapist. I'm not a therapist. I got some great ones." Between psychotherapy and all the magic they were doing and then actual interventions to knock down his titers, his EBV titers and then address his thyroid and adrenals. He recovered just fine and went off Adderall and he went back to a normal life.

Dr. Todd Born:He was not about ready to change the tattoo situation. He owned it and he was quite gifted. His tats were quite nice. The other thing would be when I see people, I am known as being a vampire, the phlebotomist of my community. I run a lot of blood tests in these patients. I do it for two reasons. Number one is that they've never been adequately worked up. They've only had bits and piece looked at. "Oh, I looked at just the thyroid and they were fine." I fill in the gaps. The other thing is is that I use it as patient motivation. People, as I was saying earlier, are very empirical, so if they see abnormal values on their blood test, they're much more likely to do what I'm asking them to do, because they get competitive and they want those inflammatory markers to come down. They want that vitamin to get to the level that I'm suggesting, et cetera, et cetera.

Alex:I think it's also, going back to what we were saying a little bit earlier, it's also deeply reassuring when people actually see tests come back and go, "Holy shit. Here's the explanation of these symptoms that I'm experiencing."

Dr. Todd Born:Right, right, and what we'll talk about some of the ones that are ... These are routine labs, a complete blood count, chemistry panel, thyroid panel, including free T4 and free T3, inflammatory markers. I do run creatine kinase just to see if they're having some kind of abnormal muscle wasting disease and if those were abnormal, then I could send them for a biopsy because what if they have myasthenia gravis or they have an autoimmune disease that is not a ... It's a seronegative spondyloarthropathy. It's not ANA positive. I do run all these and I have yet to see creatine kinase to elevated enough to warrant a biopsy. Usually, it's just because they have

exercised too much the day before and they had some muscle breakdown and I retested and it's normal.

Dr. Todd Born:These are diagnosis of exclusion. Running hemoglobin A1c, fasting insulin, these kind of thing, C-peptide. Then the advanced approach, right? That's when I do run things like methylmalonic acid plus serum B12. The reason I run both of them is that methylmalonic acid is a much more sensitive marker for B12 deficiency than serum B12, and then all these are done fasting, because B12 is stored in the liver and then released, but if you have someone who's on the lower normal range, but still within range of B12, then I know that that could be causing some of their symptoms and I might give them some injections or lozenges or whatever.

Dr. Todd Born:RBC magnesium with sera magnesium. Magnesium is very difficult to assess. It's intracellular cation, so usually if you combine serum and RBC, you can get a good idea of magnesium status. Again, more as motivating factors, particularly if they have pain. Ionized calcium, an iron panel with transferrin and ferritin and then hormones: DHEA sulfate, pregnenolone, testosterone and fractionated estrogens. I'm looking for anything that might be causing some of their symptoms or worsening it. In the beginning stages, these will probably be normal. In advance stages, they're abnormal, but that's just because of the fact that they've been going through things so long, the hypothalamic thyroid, pituitary, adrenal, ovarian axis is completely deranged so everything's going to start getting off, which we know.

Alex:I guess that also where ... There's a combination between having the kind of objective scientific data and the more subjective clinical interpretation of that data and that that's the figuring out of is this just a symptom of the wider picture of what's going on or is this potentially one of the drivers of what's going on.

Dr. Todd Born:Right. I'll give you a good example so people can relate to is that if someone is stressed out all the time and they have chronically elevated values of cortisol. Cortisol inhibits the deiodinase enzyme that converts T4 to T3. The brain registers that as, "We don't have enough thyroid hormone. I need to make more thyroid hormone," so TSH goes up. Then what happens is it spuriously elevated, so then that person gets put on thyroid medication, but it makes them feel worse, it makes them feel hyperthyroid. They get anxious, diarrhea, tachycardic. They can't sleep. It's because the wrong gland is being addressed. You treat the adrenal gland a normalized cortisol rhythm, the thyroid fixes itself.

Dr. Todd Born:You'll see this quite a bit with testosterone production. You don't have to go right to the big guns and that's were naturopathy and

functional medicine, it's this whole therapeutic order. Let's start here and then let's see how you ... Once you see enough patients over time, no matter what the condition, if you've seen that condition enough, it becomes predictable as far as you should be able to intervene at a certain level and then there should be a certain outcome.

Dr. Todd Born:If that outcome is not reached, one of a few things happen. Either the person was not compliant, they didn't take what you said to take, it wasn't a therapeutic dose or your differential diagnosis is incorrect and you're barking up the wrong tree. I usually don't go right to testosterone and some of those other ones until later when I've done a few things and then maybe three months later, I'm like, "Okay, let's actually see what your hormone levels are now." 99% of the time, unless they're just in the toilet, their hormones are in the toilet, their hormones will normalize or at least come up quite a bit.

Dr. Todd Born:Then I'm like, "Cool, now we just need to do this." Usually, I have to do some hormone replacement therapy, but it's usually just pregnenolone and DHEA. Not very often do I have to go to estrogen and testosterone, because they don't need it. It totally normalizing, because the body will shunt everything all over the place to make itself seem as normal as possible and we'll talk about some of that here in a minute. Then here comes the super advanced one that kind of became my claim to fame for some odd reason in some of the closed Facebook forums, the health forums for physicians that they wanted to know what I was doing and that's also why I wrote this presentation is that I gave it a few years ago at a conference, because people were like, "Dr. Born sees a lot of chronic fatigue syndrome and he seems to be able to get people better. What's up with this?"

Dr. Todd Born:Most of my patients, like 90%, they actually had reactivated Epstein-Barr Virus and/or cytomegalovirus and/or herpesvirus 6. When someone is testing for reactivated Epstein-Barr Virus, it has to be a quantitative test, not a qualitative test, so you see this quite a bit is that they get just a qualitative test, which just says, "EBV is positive or negative." Well, 90% of all individuals in the industrialized world have been exposed to Epstein-Barr at one time in their life. It's ubiquitous. You go to college. Everybody's got it.

Dr. Todd Born:Since Epstein-Barr is in the herpes virus family, then as humans, we never fully clear any herpes virus. That's why when you get chicken pox as a kid, you can end up with shingles later is that the body's immune system keeps all of the viruses at bay and keeps them under control, but there needs to be an opportunity for them to react. They get an infection. They get really, really stressed out. They lose their job. They have an toxic relationship. Then all the sudden, they get Lyme Disease, they get whatever.

They get mycoplasma. They get pneumonia and then all the sudden, they're wiped. When you test the titers, they'll see them through the roof and what leads me to test people's titers is when they come in and they have chronic fatigue syndrome. I always ask them the same things. "Do you have fever that comes and goes? Do you have lymph swell, your neck lymph nodes and they swell and come and go? Do you have a sore throat that comes and goes?"

Dr. Todd Born:Almost always, they will say yes and almost always, I test these titers and they usually are so high, the lab will just have the greater than symbol. They can't even test the titers anymore. In order to actually diagnose someone with reactivation, this is what needs to be tested. I see this happen a lot is that people will come into me and say, "Oh yeah, my doctor tested me for Epstein-Barr," but they didn't test nuclear antigen or they didn't test early antigen. You have to test viral capsid antigen. You have to test all of these and you have to have basically the early antigen, the nuclear antigen and the viral capsid antigen, IgG titers elevated.

Dr. Todd Born:Not everybody. You also look at your patient if some of these are elevated and if it walks like a duck, quacks like a duck, I'm going to treat presumptively. Not everybody falls into these lovely patterns, but their symptom picture doesn't lie. Randomly sometimes, I'm like, "Well, their panel is negative and their symptoms are negative. Let me just treat them presumptively with herbs because I've tried a few other things and nothing worked." I would say half the time it works and half the time it doesn't when I treat them with the botanicals, which we'll get to in a minute.

Alex:But 50% ain't bad when you have people that have been ill for a long time.

Dr. Todd Born:Exactly, so I'm like … and the herbs are quite innocuous. They're very safe. I just say, "Let's give it a therapeutic trial. If you don't feel better in three weeks, then it's not an infectious cause." But most often than not, people are … One, they present with chronic fatigue syndrome and they have that picture of the lymph nodes swelling, coming and going, the pharyngitis that comes and goes and the reason that is is that from my understanding of the immunology papers is that what's happening is the virus is replicating and as the virus replicates, the virus is doing this and your immune system is trying to meet the virus and quell it. That's why you get waxing and waning, so people feel terrible because the CBV or CMV or whatever, their virus is replicating, replicating. Then their immune system knocks it down and then they have this quiescent period where they feel normal and they go through this cycle about every six weeks, it wax and wanes.

Dr. Todd Born:Well, if it goes on long enough and they don't get the help they need or don't recover on their own, what happens is the circulating pool of white blood cells becomes depleted and now these people are sick all the time. There is no more waxing and waning. They will have lymph node, lymphadenopathy, an exam. I'll look in their throat and it's all swollen and red and usually these kind of things, so when I give them the botanicals, all this usually goes away, which brings us just to treatment is that conventionally, they're just saying, "Do graded exercise and CBT, antidepressants," which I don't necessarily agree with, unless like you said earlier, really they need to be implemented, because that's just the time you need to buy. If they're suicidal, that's a time that they probably need a psychiatrist on board to have a talk with them and figure out what would be best.

Alex:Yeah, it could be helpful sometimes to stabilize someone enough to do the other work that needs to be done, but it's just a resolution to the actual issues.

Dr. Todd Born:No.

Alex:It's a stabilizing process and that's is my observation.

Dr. Todd Born:Exactly and then you just get them off of them once they stabilize, because it's just masking. A lot of antidepressants just cause more fatigue. Sleep hygiene, if they're not sleeping well or sleeping too much, support groups. It depends on the person. If they're a person who needs people and they want people around then I would say, "Hey, join a support group." If they're a person who's more reticent and they're like, "I don't really want to talk about my feelings with anybody." "Okay," which also leads me to the world of homeopathy, because then that's a different kind of remedy.

Dr. Todd Born:Iron therapy for non anemic patients. Again, these are the conventional treatments based up their diagnostic criteria. But when we get to the world of naturopathic or integrative medicine, functional medicine, here's a study where two-thirds of patients who had CFS said they were dissatisfied with the quality of medical care they were recieving and they felt that their clinician had poor communication with them and educating regarding their diagnosis.

Dr. Todd Born:Especially you, as a psychotherapist, knows, **Alex**, and a lot of people out there, is part of the therapeutic relationship and just part of the treatment begins when you just sit and listen to someone, just for them to know that someone cares and someone hears them out and doesn't think they're crazy. You're already on the road to recovery, because they're like, "Thank God. Someone listens to me. Someone knows what's going on and this

is awesome." Then also trying to find the accurate underlying abnormalities and address them, some counseling, great at exercise, sleep hygiene, diet is huge, constitutional homeopathy, which is beyond the scope of this discussion, mitochondrial support, gemmotherapy, [elego 00:59:42] therapy.

Dr. Todd Born:These are not things I'm doing all at once. I'm doing a couple things at a time and we'll talk about why ... As I said earlier, just thorough history and physical exam. I look for themes and trends. Am I going to go down the infectious cause? Am I going to go down the mitochondrial dysfunction cause? Am I going to go down to immune dysregulation? Is it all of them? Is it mold? That's going to basically dictate my treatment. A lot of times, clinicians, particularly with CFS, because it can be complicated, they're just like, "I'm just going to throw all of this stuff at you and hopefully something sticks," which is not a good way to go, because number one, what is something goes wrong. It's too difficult what happened because you gave them too many things to do and two, these people are exhausted.

Dr. Todd Born:They can barely get out of bed in the morning and now you give them a treatment plan that has 15 things on there and they're like, "Whoa." You'll probably never see that person again, and then you won't be able to help them, so just keep it simple.

Alex:Yeah, and I'll say it's a patient group that often have sensitives to supplements or strong treatment programs. If you do too much too quickly, you just make things worse. You have to take it slowly and kind of one or a few things at a time to see what's having what impact.

Dr. Todd Born:Yeah, good point. Thanks for bringing that up. That's very true is that ... Remember there's immune dysregulation. There's immune derangement. They have all these layers on, so they're not your normal person where you can give them something and you're like, "Cool, I'm going to give them some B6 and see what happens." It's like you could blast them out of the water. I'm a big fan of test doses. I might just give them one thing in a very small amount and say, "Just take this. See how you feel." If you don't have an adverse reaction, that's a good thing, because I now I can at least go up on it. If you have a bad reaction to it, well then I can't go any lower on this. Let's try something else.

Dr. Todd Born:I would say that my own clinical approach would be so they see me, history, physical exam, I review a lot of their blood tests. For me, I only really care what's happened in the last six months as far as microbiome testing, blood test, any diagnostic imaging over the last 12 months, because if anything older than that, it's fine for a base line, and they're in usually such a different state of life and affair in the course of their disease that I only care

about things that are six months earlier. Then I'm going to run my battery of things, typically.

Dr. Todd Born:I usually give them a constitutional homeopathic remedy at the end of the first visit. Then I run all the blood tests and I drain them and then I have them come back in three weeks. Then I say, "Okay, what did the homeopathic do and not do? What do your blood tests show," and maybe some microbiome testing, if they coming in with lots of GI issues. I'm usually going to add that on. Stool testing, I like them. I like doctor's data for their stool microbiology profiles. They're inexpensive and they're very accurate and they've been running them forever. I know the owner of the company. I know the lead scientist. They're just great.

Dr. Todd Born:I have no affiliation with them except that I like them a lot. Then if they're positive for the Epstein-Barr, CMV and/or HHV, which almost always they are, then I give them these three botanicals that are gemmotherapies. gemmotherapies are a type of ... They're literally herbs on steroids. They're herbs that unlike ... Tinctures are alcohol and herb and a little bit of water, macerated and then extracted. Glycerin is glycerin, a little bit of water, herbs and extracted. Gemmotherapies are herbs, water, glycerin and then they're also diluted to one to ten so you have a little bit of that energetic aspect of it, so you're almost like ... There's still a physical substance in there, because it's only a 10 dilution, but it's almost working on cellular transcription.

Dr. Todd Born:These are the young shoots to the young buds, so [etergetically 01:03:52], it's where all the plant is putting all of its goodies, but also biochemically. The plant is growing. It's the bud or it's the shoot or it's whatever that particular gemmo was made from. It's super phytonutrient rich and dense. These three herbs work and they work really well and they work really fast and they're well tolerated: acer campestre, juniperus and tamarix. The issue recently came up about six months ago is that tamarix by the few gemmo companies in the world do not seem to be making it anymore. I'm not exactly sure why, maybe poor sales or they just can't source it.

Dr. Todd Born:Now, I've been using acer, juniperus with the medication valtrex, which is valacyclovir and it's working almost as well as the herbs, but better than just giving valtrex by itself. I know that everybody listening has medication scope in their practice, so work with someone hopefully that does, if these are positive. I add in what's called an [elego 01:04:54] element. An [elego 01:04:55] element is just a physiological dose of minerals, not a pharmacological and they're already ionized, so they're already charged, basically, similar to what you would do if you took it and had hydrochloric acid molecules added.

Dr. Todd Born:Copper, gold, silver, people might get a little concerned when they see gold and silver. These are in parts per million. Gold is used in Ayurvedic medicine and has for 5,000 years. Silver, you want to make sure it's in parts per million unless you want to end up with a condition, it's rare, called argyria, where people turn into smurfs and I have seen it once in my residency. There was a woman who bought a substandard colloidal silver off of Amazon it was just total garbage and she drank too much and she turned blue and she was blue for the rest of her life.

Alex:Wow.

Dr. Todd Born:Yeah, it was odd. I felt really bad for her. It was weird, because sometimes when I would see her, she would be blue and then sometimes purplish and then sometimes like this green hue. It was all over her body. It was head to toe. Yeah, it's certainly enlightening.

Alex:It's the kind of stuff you read in the textbooks. You rarely see it, right?

Dr. Todd Born:You rarely see it. It's unheard of unless someone takes too much silver and it was during my residency and yeah, it was one in a billion probably. I'm glad I saw it. Then giving them a potent multivitamin mineral, again, test dosing and making sure it's hypoallergenic. The reason I'm giving them this is I got to get some nutrients into the system, so mitochondrial precursors, I've got to get the B-complex to help modulate cortisol production and neurotransmitter production and help with their immune system. Instead of giving them a lot of supplements, you can achieve it with a nice multivitamin mineral.

Dr. Todd Born:Then the prebiotics, probiotics, saccharomyces boulardii. I'm a big fan of these for a lot of reasons, but I put two papers in here that showed in chronic fatigue syndrome literally inflammation in the gastrointestinal tract worsening CFS symptoms, so you want to put out the fire. Probiotics, you just be cautious of the probiotics you get, because most of the stuff on the market, there's been independent studies that they're either contaminated with pathogenic bacteria and/or they don't even meet label claim, so just get a good quality probiotic and probiotics are wonderful as long you take them and they do lots of things. I'm going to get into strain and genus, species, strain specificity. Just a nice well rounded one, because there's no studies showing it one way or the other, like this particular one does it.

Dr. Todd Born:But it has a washout effect, right? Probiotics really only work as long as you take them and depending on the strain, up to a certain amount of time after you start. Prebiotics are indigestible fibers that feed your healthy flora to grow. XOS, which is xylooligosaccharides is nice versus FOS, you

usually need 10 to 20 grams to make a difference. Most people don't tolerate that. GOS, galactooligosaccharide, you need about five. XOS, you only need about two. It's made from non-GMO corn cob and you only need about two grams a day. It's a powder. I like it as a powder so I can titrate with people. I'm like, "Sprinkle some on your food." Keep increasing it, and then saccharomyces boulardii, very important. It's a non-colonizing beneficial yeast that's wonderful, that it feeds your healthy flora to grow, it increases [secator IGA 01:08:45]. It's immunomodulatory, very anti-inflammatory. Here's a whole paper on it. If you ever have insomnia, read that. That'll put you right out.

Dr. Todd Born:It's wonderful. You can really give people a lot of it. The only concern would be people that have like keksia from AIDS or cancer. There are some case reports of fungemia, but again, that's patient population. You want to start stimulating the immune system, modulating it, calming the fire, getting their immune system to recoup on its own so they can start healing themselves.

Dr. Todd Born:Now, they saw me the first time. They come back in three weeks. Are you better? Worse? Here's what your labs showed. If it's EBV positive, I'm going to give you these herbs. Come back in six weeks. I would say 98% of the time, these people are 90% better, going from of energy level of an average of three, ten being the most, three being nothing and now they're like, "Oh my God. This is fantastic." For those people, I just give them this herb called ribes nigrum, which is black currant as a gemmo. It's very stimulating, very yin tonifying, so I might give someone like five drops and say, "Okay and then increase."

Dr. Todd Born:For those though that aren't better, but they responded to treatment. They're like, "I feel better, but I'm 40% there." I just repeat the herbs and then I might add in Valtrex or something. Those 2% of the 150 to 200 cases of CFS I've seen that have not responded to the herbs, then I will give them more antivirals. Valtrex is very safe. I do like to take breaks. I keep them on a hepatoprotective, milk thistle, juniperus, which is juniper, any of these things to protect the liver is great.

Dr. Todd Born:Then this humic acid from Allergy Research Group. It is awesome, because humic acid has been around since the earth was formed. It's in the soil. It's in volcanoes in Iceland, is just humic acid dream. We understand very well the mechanism of action, that it say interferes with the virus's ability to attach to a host cell, penetrate and reproduce, so it's inhibiting its ability to replicate.

Dr. Todd Born:If someone has a herpe HHV 6 or HSV 1 or 2 or any of these herpes viruses, I have seen humic acid work ready well and you can do

maintenance doses. I have some patients, they just take one a day after a loading dose. They get better and then they might take breaks, because I don't like the body to get used to it and then if their symptoms come back, they just go back on one a day and they feel totally fine. Here's a whole slew of papers showing it.

Dr. Todd Born:What about those people, for all our listeners out there, they're like, "Yeah, I know all that. I knew all these things." or "I implemented what Dr. Born said, but there was no infectious cause. They don't have those symptoms that wax and wane. What do I do?" Then it's time to dig some more, but don't mess around with them, because a lot of these people, and you probably experience a lot in your clinic is that these people have seen usually so many doctors, so many clinics, they're usually broke and the last thing you want to do is add more financial stress to their lives.

Dr. Todd Born:Unless you know what you're doing or send them to someone who does or just be very systematic. That's when I start digging into heavy metals. There's a good amount of evidence of heavy metals, they adversely affect the thyroid gland, the adrenal gland, they inhibit mitochondrial function. I will assess people for heavy metals with unprovoked urine and blood, so no chelating agents and then I compare their data to the CDC data.

Dr. Todd Born:Mold: I'm not a mold expert, but the patient I was referring to before that fortunately stuck with me for a couple of years and I did everything with her and she just kept sticking through it. I was like, "What is going on?" Maybe after a year and a half, I got her 25% better, maybe. She was one of these like the homeopathy helped with her mood, but that's it. I was giving her B12 injections. We were doing everything. Finally, I was like, "You know, what about mold?" I used to a practice in an area in the United States in the San Francisco Bay in Alameda, California. It's on the water. Everything is old and everything is full of mold.

Dr. Todd Born:She said, "Yeah, definitely my house is mold." I was like, "Does it smell musky?" She said, "Not really." I gave her a mold questionnaire and I said, "Where do you work?" It happens that she was working in Oakland in an old, abandoned warehouse that a company purchased but never remediated and never removed all the mold and the asbestos. They didn't do anything. She was working there and I said, "Are there any other people at your work that have same symptoms as you?" She's like, "Oh yeah, a bunch of my coworkers. They're all exhausted all the time." I was like, "Well, I don't like to get involved when it comes to legal stuff unless I have to," but I said, "Look, I think you should call the CDC or the Department of Health." I said, "Call the Oakland Department of Health and just talk to them and see if someone will

come and inspect the building." This company wanted to cut corners and they …

Dr. Todd Born:So yeah, it turns out they came in, they tested it. Place was totally mold infested and they … I don't think there was a lawsuit. I think what ended up happening was is that the company shut them down. They had to move all the employees. We treated her mold. She's totally fine.

Alex:Wow, fascinating.

Dr. Todd Born:It was fascinating. I'm like, "Man, lesson learned for me. It took me almost two years to have a light bulb moment, probably a year and a half," and I was like, "This poor woman just fortunately stuck with it." Here's a good paper about mycotoxins in patients with chronic fatigue syndrome. Again, it has to do with genetic susceptibility. They just can't seem … Again, if mold caused CFS for everybody, everybody in this woman's workplace would have had the same symptoms, but only maybe five of the employees did. It has to do with genetics. They just couldn't clear the mold, deal with the mold.

Dr. Todd Born:It probably also didn't help that she lived in a moldy area, but most places in the Bay are pretty moldy, because it's near the water and stuff's old. It was all built in the 70s and not real well insulated for mold deterrence. Look for other infections, Lyme disease, tick borne illnesses addressed as glycemia, food allergies, sensitives, intolerances. Again, none of these are going to be your magic bullet. The mold one was an outlier. If looking at all of these things, and there is a difference between a food allergy, a sensitivity and an intolerance. Food allergy is a type one IGE mediated immune reaction. That's the person who eats a food say shrimp and their face blows up or their get hives or a scratchy throat all the way to anaphylaxic and they need an EpiPen or they're going to die.

Alex:Right.

Dr. Todd Born:An intolerance is actually an enzyme insufficiency or deficiency where the symptoms are relegated to the deficiency tract only. Lactose intolerance being the most common in the industrialized world. You don't have enough of the enzyme lactase to break down lactose. Food sensitivity is a world that you and I mostly deal with and that's totally different. It may or may not be mediated by the immune system, so that is why when patients, I'll come off the share screen here so you can see them, is that with food sensitivities is that you may or may not have systemic effects. You may eat the food and get brain fog or you may get headaches or joint pain. That's mediated we believe by the immune system. When you're running an IGG food panel, that sensitivity, unless it's actually mediated by the

immune system, will spersley negative. That's why the allergy elimination diet is the gold standard for food sensitivities and intolerances, because you would be able to pick up things that are not mediated by the immune system.

Dr. Todd Born:Remember it's like you have all these things that are just ... If you have a cup that's half full of water and you add on mold and chemicals, intoxicants and infections and food issues that are causing inflammation in that individual, eventually that cup overflows and your job as a clinician is to keep taking each one of those things away to get incrementally better. It's particularly what the complex cases who are not responding to normal treatments when you're like, "Well, I'm doing these things and they're not responding."

Alex:Particularly with the food intolerances, it's also, again, it's often a symptom rather than the cause, right? It's understanding what's happening, be it gut inflammation or whatever it may be, which is actually the reason why the immune system is responding the way that it is.

Dr. Todd Born:Exactly, so imagine you have this immune dysregulation and it's already kind of in overdrive and not responding to things and the endocrine system's not responding, because they all are in cross talk. Then you have this intestinal hyperpermeability, leaky gut. Here's your normal intestinal junctions. Now you have leaky gut, so you have gap junctions, so all these things you're putting into your system are proteins are leaking through and the immune system's like, "Whoa, that's an invader," and it's further agitating an already over-agitated immune system.

Dr. Todd Born:So if you start cleaning up the gastrointestinal tract, all of the sudden these food sensitivities, they may go away completely or at least they're just mitigated, where they're all like, "You know, I had that ... I went to a dinner party and I had a cupcake and I was fine. I ate that second cupcake and I paid the price." That's typically what happens. If you have a straight up food intolerance where you have like a genetic deletion and you're not producing any of that enzyme, that's not going to be rectified. You just have to avoid it. Celiac disease, you're just not going to be able to break down gluten, so you need to avoid it for life. There's just no way around it.

Dr. Todd Born:Now you got, for me anyway, it's like .5% left. Nobody wound up with any of my anything, right? They didn't have mold. They didn't have heavy metals. They didn't have anything, which is actually more common is that everything I did helped, but they still got a little bit of the symptoms left and their life is not optimal. We want to get people optimal and have their 100% quality of life back. That's what we strive for. Then I am into mitochondrial support, but as we discussed earlier in those papers, unless

you fix the underlying problems, you fix the mitochondria, you can throw mitochondrial precursors at these people all day and you won't get any more minimal ATP production.

Dr. Todd Born:That's where something like lipid replacement therapy comes in, which is NT factor, which actually ... What the studies are showing, it's all theoretical, but they have good mechanism papers that it actually repairs the mitochondrial membrane. If you have a leaky mitochondria, then you're putting all these nutrients in. It can't produce the ATP, but if you repair the mitochondrial membrane, then you can start giving these precursors like coenzyme Q10 and NADH and magnesium and all the sudden, people start responding. This was my lesson learned is I would see people when I first started my career out with these symptoms.

Dr. Todd Born:I'm giving them all these things. They're not really responding. Then all the sudden, I start doing the at the end, after I've treated them for a while. Lo and behold, it was like miracles. They're just hyper responders to a little bit of CoQ10 and a little bit of NT factor. NT factor comes in these chocolate chewables that have CoQ10 in them and you can just snack on those things all day and it's real chocolate and people love them. You can give them to kids. You can give them to everybody. They're very safe. You can't really OD.

Dr. Todd Born:One of the point is to repair the mitochondrial membrane and repair all cellular membrane so they actually retain their fluid membrane, transmembrane abilities so you actually get good talk between cells. Other precursors, I just-

Alex:I was going to say it's the appealing alternative to the cupcakes at the dinner party, right?

Dr. Todd Born:Yes, it is. Just had them out. Like, "Here. Here's some real chocolate. You get to have healthy lipids." What is NT factor is that it's lecithin, but if you buy egg lecithin or you buy soy lecithin, they will vary from batch to batch and phospholipids, they oxidize quickly anyway, but NT factors patents are ... Some of their patents are around the blend, so you get the full blend of phospholipids and glycophospholipids, but what you're also getting is they add some things to some of the products that help stabilize it from oxidation. They'll still oxidize. The lipids are lipids, but it slows down the rate of oxidation, so it's nice of oxidation, but what's nice about NT factor, you're getting the same standardized amount of all the phospholipids and glycophospholipids every single time.

Dr. Todd Born:Most of the studies, the original studies were done in fibromyalgia and chronic fatigue syndrome. They have this great study on cancer patients and cancer induced fatigue. Not only did the fatigue improve but even better for oncologists, they showed that it did not interact with any of the chemo drugs. It was nice to be able to pump these people full of lipids and then the oncologists, rightfully so, was just like, "I don't know what that is. I don't want it to mess with my treatment." Here's a paper showing with a number of different chemo agents, it did not interact adversely.

Dr. Todd Born:And it's a better alternative to your cupcakes. I just put in slides about other mitochondrial support that I like to use as well as what has good data to support it. Carnitine, the reason I put these in different forms that the different form of carnitine has different effects in the body. L carnitine is not the same thing as acetyl-L-carnitine, but in these two studies when they gave people a mix of carnitine, the second one, the carnitine derivatives, they actually had better improvements than giving just one type of carnitine, which makes sense. If they have different biochemical interactions with the body, it would make sense that giving different ones ...

Dr. Todd Born:Preferably a way for other amino acids, because there's some theoretical competitive inhibition. I like to just give it away from food or with carbohydrates, since there's no amino acids there. alpha lipoic acid, ethyl containing molecule, the caution with this is if they have dysglycemia and orthostatic hypotension and they have reactive hypoglycemia after they eat meals, which is a post postprandial syndrome, so their blood sugar drops when they eat foods, then this is going to drop their blood sugar even more, because it's a hypoglycemic agent. That's why it's great for diabetics. Any of the thiol containing molecules, really high dose glutathione. There's a debate whether glutathione is stable orally. That debate fortunately has been solved that if you have it in an acetylated form, it's much more likely to be stable and it actually can bypass a little bit of the first pass effect of the liver and get right into the cells where we naturally deacetylates it and you have free floating glutathione to be used intercellular where your mitochondria is.

Dr. Todd Born:Plus, it's great for people with chemical sensitivities and works a little better than alpha lipoic acid, especially for those that can't do injections or IV therapies. Last, getting towards the end here, would be just giving people good essential fatty acids, high quality fats, similar to the lipid replacement therapy. Some people get nervous when they see omega 6 in my slides, because they just immediately go to arachidonic acid, but if you remember, gamma linolenic acid, like GLA from borage oil and eating primrose and currant, they're very anti-inflammatory. Omega 9, oleic acid, is found in avocado oil and olive oil, is great.

Dr. Todd Born:I like to change oils up in people to start repairing membranes and getting their mitochondria working. Plus it's good for mood. It's anti-inflammatory. We know inflammation plays a significant role in CFS, so all the more reason to take nice, high quality that is not subject to poor oxidation. If people don't really want to use the gemmos, they can't ahold of them, and I am a big fan of just adaptogens, lithania, wichisasroganda, panax ginseng. This is where I also like to have a little soapbox moment about the ginsengs are a good way to look at it is that they're ... These adaptogens, they are on spectrums, so if you have that patient who comes in and they're wired and tired, you don't really want to give them a stimulating adaptogen, like rhodiola or panax ginseng or if you do, just go really low dose.

Dr. Todd Born:You might want to give them a more yin tonifying herb, like American ginseng or ashwagandha or holy basil, because that's going to be much more tonifying. The person who comes in and they're totally wiped up and they're cold and they're tired, yeah, give them those stimulating herbs, because they need them. I see this quite a bit. People come in. They're like, "Oh, I took that. It just made me feel all jittery." It's because it was just the wrong botanical.

Alex:Yeah, some of those people have to have enough ... If the system's really crashed and it's really overstimulated, trying to compensate for the crash, it makes sense to give them stuff to energize, but as you say, actually the energy just goes into the nervous system and actually then it causes more of a crash, so yeah, you have to really respond to ... You have to use the body as a feedback system I think sometimes to hit the right note.

Dr. Todd Born:Yeah, exactly. That's what I think people miss a lot. They're like, "Oh, well, they have CFS." I've had plenty of people with CFS in the beginning to middle of their syndrome where they're still ... Because they're high energy people anyway.

Alex:Yeah, right, exactly.

Dr. Todd Born:Their baseline was like me. Their baseline's already up here, and so CFS knocked them down to a normal energy level, so I'm like, "I'm not going to give you panax ginseng. I'm going to give you these." People that come in like that one woman who had the mold, I would giving her stimulants of the stimulants and the nutrients from the botanical world, more doses than I've ever given anybody. She would come back and I'm like, "So what are you doing?" She's like, "I don't know." I was like, "Man, this is so weird. Something else has got to be going on."

Dr. Todd Born:Astragalus, I'm a big fan of astragalus, because not only is it … Most people know it for the polysaccharides as immune stimulating, but in Chinese medicine, it's a huge adaptogen, so you get … Most adaptogens also are immune modulating as well, but astragalus is nice because you get the immune support and you get the adrenal support. These are just other strategies I put in. Don't give up on your patients and whether you're going to use hormone replacements, intramuscular IV therapies, physiotherapy, hydro, acupuncture, massage, craniosacral. I don't know if there's any studies per se on low dose naltrexone with CFS. There certainly is in fibromyalgia, just don't use it if they're on opiates.

Dr. Todd Born:Germanium is another one I like a lot, because there is a study on chronic fatigue syndrome. Germanium has been used a lot, because it's a really strong antioxidant which again, just use something like Allergy Research Group's, because some of the germanium products out there are inorganic germanium and that will cause acute renal failure, so you have to use the organic germanium. They come as powder, chewable, capsule and there's some good data for it with mitochondrial function. In cancer, it's mostly used in IVs, because you have to get enough into someone, but it does work well.

Dr. Todd Born:Colostrum, I like it as a phospholipid powder, because again, you're getting the lipids, it's a powder that you can titrate, because some people, it does have like 40% lactose. It might mess with their stomach a little bit and just if you need some immune support. The summation would be that it's a multisystem, multifactorial condition that if you listen to it with an open heart, scientific inquiry, your outcomes will be improved. Diagnose them first, at least try to. Consider the naturopathic therapeutic order. Don't overwhelm and KISS would be just keep it simple, just a couple things at a time. It may be some hand holding in the beginning, but you'll have better outcomes in the end. That's it.

Alex:That was a powerhouse of information. Maybe just as a summary. There's a lot of pieces that we've covered and I think in many ways, we've done two interviews in one in a sense, laying out the context and the background then coming more into the potential treatment parts. If you were to summarize a few key products … I know that you're here speaking independently, but you also work with Allergy Research Group, great sponsor for us maybe just a few recommendations that you want to just bring out at the end here.

Dr. Todd Born:Yeah, sure. Once you have the underlying, but even if while you're digging, you may have to just do something to get them better while you have to dig. There's many times that they've seen everybody. You're they're last hope. You just got to keep working with them, keep going, so you can at

least make some in roads and that would be things like NT factor, germanium, adaptogenic herbs, if thyroid's not coming up. You could even use the glandulars. I'm not a big glandular prescriber, but I know a lot of practitioners, particularly in the UK, a lot of nutritional therapists love the glandulars because again, Allergy Research Group's glandulars are fantastic, because unlike a lot of other companies, the glandulars that Allergy Research Group uses from New Zealand and Argentina, they are not defatted and they're not chemically washed.

Dr. Todd Born:They're literally grown under strict husbandry conditions in New Zealand for example or Australia. The animals and then literally they are desiccated, the lipholise, they're just washed off and then they're immediately capsulated or we encapsulate them. You're actually getting all of the nutrients, all of the peptides, all of the hormones in those, so I know a lot of practitioners that they get great results of using the thyroid or the adrenal or the spleen or what have you. And using the adaptogens, because it's going to help modulate that stress response, it'll help with their fatigue, help their immune system. The adaptogens and I would say germanium and NT factor would probable be my ... and a multivitamin would be where I would go to first while I'm digging and talking to them and doing labs and waiting for the labs to come in. Even when I do get the labs, I still keep them on them and for maintenance, they usually always end up on these botanicals.

Alex:Yeah, I think it's a fantastic point actually to kind of just going back to what we were saying a bit earlier that there are ... Although it's super patient specific in terms of figuring out what's going on, there are these kind of underlying core principles that the vast majority of people will have significant benefits in terms of supporting the system along the way of that journey.

Dr. Todd Born:That's right, and saccharomyces would be on there. Again, it's not all at once. The first appointment, I might say, "Let's get you some saccharomyces boulardii. Let's get you on a good probiotic. Let's start with the multi. Come back. How you doing? Okay, let's get you on some sleep hygiene, and a combination of phosfiddle serene and phosfidic acid helps really well to ... because it competes for cortisol binding sites, so it lowers cortisol throughout the nothing. I usually have people 400 milligrams at the end of dinner and then by the time they're ready to go to sleep, they don't have those cortisol surges and then over time, with the adaptogens, their cortisol regulates itself on its own.

Alex:Awesome. There's so many questions I could have asked you along the way, but I was mindful of time. I was like, "I need to just let Todd get to the end of his presentation time." Thank you so much for sharing so much amazing information. This has been immensely helpful for people.

Dr. Todd Born:Great.

Alex:Just to give a shout out to Allergy Research Group, who are one of the sponsors of the conference and we worked with their products and Nutri-Link, who are the distributor here in the UK. We've had a I think probably 15 year relationship now working with them, have some excellent product, so a thank you to Allergy Research Group and Nutri-Link, but also Dr. Born, thank you so much for sharing so much wisdom. We really appreciate it.

Dr. Todd Born:Sure. Thank you. I appreciate it. I hope this helps everybody and thanks for putting this conference together and I think it's going to help a lot of people. It's free, so people have no reason not to listen.

Alex:Thank you very much, much appreciated.

Dr. Todd Born:All right, take care. Cheers.