## Introduction and guest background

For the. Welcome back to the reversing mast cell activation and histamine intolerance summit. I'm your host Beth O'Hara of Mast cell 360. And today we are going to have what I think is a game changing conversation for people dealing with sensitivities, with mold toxicity, with mass activation and issues like this on a mia, chronic fatigue, brain fog.

And the list is going to go on and on. But I really hope that you stay and listen to this entire interview, because this is huge information and it's really, new to some of the things that we've been talking about, even though it's been around for a while, we're going to be talking with Doctor Chandler Mars, and she's an independent health researcher and writer.

She's the coauthor of the book Thiamin Deficiency Disease this Autonomia and high calorie malnutrition. And she's also the author of over 200 articles on various topics from women's health and hormone to medications reactions, mitochondrial function and dysfunction.

And she's the founder and editor of the online health journal called Hormones Matter, and that's her website. I really encourage you to check it out. And there's an archive of over 1400 articles and an in-depth research, analysis and patient case stories.

And she's founder administrator of a patient group on Facebook called Understanding Mitochondrial Nutrients. Her work has changed my work and has a huge depth of gratitude for that.

And it's changing how we're working with our, really sensitive population here at mast cell 360. And, just a fun note about her in her spare time. She's a competitive powerlifter, and I've seen a couple of her videos on YouTube.

It's impressive. And she works to support strengths Sports for older women through her website and Facebook group called Old Ladies List. Welcome, doctor Chandler is just a delight, a pleasure, and an honor to have you with us.

Oh, thank you for having me, I appreciate it. Can you tell us a little more about how you got into specializing? I mean, this is I just want people to understand the massive depth of specialization and research and timings.

I've been I've been gobbling down every piece of your work I can get my hands on how did you get into this and make some of these, discoveries? Because this is a really game changing.

Well, I, I owe a huge debt of gratitude towards, Doctor Derek Lonsdale. This has been his life's work for the last 40 and 50 years. He's 90 something at this point.

And he and I met through a parent, a young woman who had been injured by the Gardasil vaccine. The mom had done her research and discovered that her daughter was thiamin deficient.

And when someone looks up thiamin deficiency, the first person they see is Derek Lonsdale. She had reached out to, Doctor Lonsdale, and the two of them had been communicating back and forth about healing, her daughter.

We had been communicating, about other factors because I had big and began doing work on Gardasil injury, and it had led me to the thyroid and it led me to some other hormone issues, which was my original background.

The mom introduced us, and from that point forward, Doctor Lonsdale and I worked together to figure out what was going on with, Gardasil injury. That was kind of our first foray in working together.

And he introduced me to thiamin deficiency. And I have to say, as, as I have a PhD, I have studied all sorts of things and brain chemistry and everything else.

And while I knew about that immune deficiency, I knew about it only from the context of chronic alcoholism. Where Nikki's course, cough syndrome and so on.

And I thought to myself, certainly we don't get that. I mean, deficient today, you know, but, Doctor Lonsdale schooled me in all of the the ways that thiamin becomes depleted in modern living vaccines being one of them.

But all sorts of medications and, and the foods we eat and, and everything else and that in fact, there, there are a lot of people, walking around with, if not blatant deficiency, insufficiency to their needs.

And gradually over the years, in the writing, the working together, we, we discovered how truly enormous, highly important. I mean, is to to chronic health issues.

## How thiamin deficiency research began

And then almost all of them come back to a problem with not enough thiamin to meet the needs of that individual. And so that's, that's my work has now moved into that, almost exclusively.

And for people that this is new for, I just want to explain to them assignment is B one. Yes. It's vitamin B one. And I had also only been really aware of B1 deficiency and things like severe alcoholism, anorexia.

And and we do work with a lot of people that are significant nutrient, deficiencies because they've been down to two foods for quite a while, but I had not had the focus on B1.

And when I found your book, Doctor Neil Nathan actually mentioned it and said, you know, you've got to read this. And he tells me to read something. I read it and I got your book and I just I mean, it was like, why haven't I seen this before?

Why am I just now hearing about it? That was a year ago. What's happened here? Because one, I think a couple questions. Why? Why aren't we talking about it enough?

And the difference between the classical how it's defined as beriberi and what you're talking about. And then also we have to speak about the RDA and I have that conversation.

A I know you probably have that conversation. A lot of people say, well, I'm getting 200% of the readings, like, okay, good. If it's getting two milligrams, that because the RDA is one milligram A3, 1.1 and 1.2, when we look at that, 1.4, when we look at vitamin C and like, okay, good, you meant the RDA.

So your teeth are not going to fall out, but that doesn't mean you're functioning optimally. Exactly. Well, let's back up even a little bit more. Let's talk about what thiamin does okay.

So we can understand from that perspective why it's important. Thiamin is is it's a vitamin. Like you said, it's vitamin B1. But it's critically important in our ability to convert food into energy.

So whenever we eat, we get, a bit of macronutrient, which is your protein, your carbs and your fats. And we get, in theory, vitamins, micronutrients, thiamin being one of them.

But, you know, all foods have different vitamins and mineral composition. If you eat a decent diet, then you should have sufficient quantities of both.

But most of us don't eat a sufficient diet. First off. So thiamin, unlike all of the other, vitamins and minerals, will thymine and its partner magnesium sits atop at the entry points to that processing of those macronutrients into ATP, which is energy.

Okay, now all of our cells need ATP to do whatever it is they do, and they need a lot of it every day. And so we need to eat sufficient amount of food with sufficient of the substrates, which are the macronutrients, sufficient vitamins to power the enzymes inside and around the mitochondria to kick out that ATP.

If we do not have sufficient micronutrients, thiamin being key again, then no matter how much food we eat, you know, mostly empty calories, but even the other substrates, however, how much we eat if we don't have enough timing, it's not going to come out to the other side and be energy.

It's going to be diverted into different pathways so that your body can kind of pull whatever it can out of it, and it'll store some of it. That's why a lot of us become, overweight.

But it won't get into the mitochondria to, to produce energy. So if we don't have enough thiamin, we don't have enough energy for the cells in our body to keep us alive in a, in a very functional way.

And so if you think of chronic fatigue, what is the key symptom there? Fatigue. It's a lack of energy and it's not a lack of calories. And it may be at some point because once you get to a certain point where you have such low and poor nutrient content, you can't eat anymore.

One of the first symptoms, that you get is difficulty actually eating, because you just don't have the energy to eat and to derive the those micronutrients out of the foods and to power everything else.

So thiamin is critically important for creating energy and everything we do, every breath we take, everything you know in our body, every heartbeat, everything is energy.

And if you don't have enough, things are going to go wrong. So that's the first thing. So then the second question is how in this, this world where starvation is not necessarily a component at least not, in the modern world, in our modern world, yes.

In other places it is. And how absent alcoholism, do we get individuals with, low thiamin? Well, that, again, is the way we structure our diets here are large component.

So we we grow foods, using a lot of intense chemicals. We stripped the soils of minerals. We grow the foods so that they are bigger, fatter, prettier, which ultimately means higher sugar content.

And then we processed the heck out of everything, adding all sorts of other chemicals. And then at the end, we come back and we add a few vitamins and minerals to them so that they have some nutrient content.

And so there's this, this kind of corrupted, nutritional landscape in which we have all kind of survived on for, for the last two generations, at least.

And so even though a lot of these foods, have vitamins and minerals in them, they have been added back after being stripped so they don't come in the original form, and they come with a variety of other toxins that are associated with that food and just an enormous amount of calories in most cases, because high sugar is, is sugar and and hydrogenated fats.

So that's one way high calories we the more calories, more sugary foods and more carbohydrates, empty calorie foods you eat, the, the more thiamin you need to process it.

Okay, so that's one way. The other way is all the other things we do. You know, we drink coffee, tea. We do drink alcohol on a regular basis, even if one is not a chronic alcoholic per se. Regular alcohol, alcohol plates, it.

Coffee does. Soda pop does.

## What thiamin does in energy production

Almost all of the medications that we take with great regularity, either damage the mitochondria such that they need more thymine, more energy to heal, or they directly deplete the simy, environmental toxicants.

I mean, there's just a long list of modern exposures that deplete thymine, none of which are, considered. When we think of the classical definitions of I mean, deficiency, which typically if you look up on the internet and you see pictures, you see people who are are starving or alcoholics, this is a two key ones.

And we have a lot of people that are just walking sick, because of dietary exposure, life stress, everything that requires energy requires timing. I just want to highlight some really critical things that you said.

And then to recap a little bit for different audience, but so one what we're talking about is that we we are living this in this world that stresses us tremendously.

And we don't have the nutrient density that we used to have. Correct. I also found studies going back to 2015 on how mycotoxins greatly deplete B1, and that's a big factor for a lot of people in our audience.

One of the other things, and most of them, they're not drinking soda pop, they're eating pretty clean. But at this point. But were they eating clean before?

They became a good point? And I used to in college before I understood these things, start my day with a Coca Cola and Diet Coke, too. And, packaged peanut butter crackers out of vending machine.

There you go. So, I didn't have good nutrition until I, right after I graduated, but, when in TI. I know we're talking about the traditional tea, the black tea, the green tea.

Some people are going to have a question. What about herbal teas? But we were talking about the tannins in those. Yes. So what we're talking about also, I just want to add into this conversation for people that many in our community have tried B6, B12, folate and there's quite what's been wonderful for me is to see the order of operations and bringing these nutrients on board, and that there's a prioritization in terms of what has to come in for.

So a lot of people group and say, oh, I can't take any B vitamins. I just want to say, I don't see that. You don't see that. It's really we have to do them in the right order, which I know we're going to touch on here.

Right order like quantity or concentration. You can't go all out out of the gate. And I think that's a problem that most folks suffer with because I've been so ill for so long.

They want something to help and they take too much too soon. So when I'm doing my burning questions is why? You know, I'm on top of anything in in this population.

I study so much, I read, I'm training constantly, I'm drinking from a fire hose every day. And that question I kept having as I was reading the book and reading your work, was, why have I not heard of this before now, what's happening with that?

And, because I know if people go and they start this conversation with their, even their functional medicine docs, I mean, I have a thousand page textbook that's a recent publication on integrative and functional nutrition.

And there's four paragraphs on thiamin la. Oh, that's the college textbook. I think the reason, the primary reason we're not hearing about it is because we we believe we solved it, with food fortification.

And so, but as we discussed previously, the problems with food fortification is it comes with a heck of a lot more than just the few vitamins that they add back at the end.

But I that's the primary, primary reason, that and I think it was entrenched into the general institutional dogma that the only culprits of this would be chronic alcoholism and, and, starvation.

Now you'll see it in, in medical journals, too, this notion that it's rare. So almost every case study you read of, thiamin deficiency, rare, rare case of this, you know, Wernicke's encephalopathy with X or a rare case rare is always used in this, context.

And I think so that that kind of feedback loop of the rareness of this continues. And so we just don't look for it. But once you start looking for it, the floodgates just, you know, open wide, and you'll find the, the reason ably and logically.

There are so many conditions that can cause thiamin deficiency. First you got the diet and we discussed that. But you know, any virus, it's going to require, more energy to, to just from a fundamental standpoint, more energy to resolve any illness, any surgery.

If a woman is pregnant, she requires more. If a woman is pregnant and is vomiting constantly. Hyperemesis is one of the key key indicators not only of thiamin deficiency as a cause, but thymine deficiency definitely as a consequence.

And not just in an in pregnancy. But yes, you see vomiting. And yeah, if there's an illness that you have that causes you to vomit, that oftentimes that vomiting virus or bacterial infection aside, is is an indication that there is not sufficient thiamin there to to feed the bacteria and everything else in your all along your gut.

So they actually produce, a fair amount of thiamin, and then absorb it into various transporters. And when you have dysbiosis of any means, they're not going to be able to produce sufficient quantities.

And as in anything, the strongest bacteria, which tend to be the more pathogenic bacteria or microbes, because it's not just bacteria, are the ones that can salvage thiamin, from various pathways, and they're the ones that kind of starve everything off.

## Why deficiency is common today

So as your thiamin levels kind of decline systemically, but definitely within the GI tract, you get the more pathogenic, microbes that come online and the good ones or the bad ones, rather, they come online because they're more adept at at making thymine from different substrates that the the more benign and healthy microbes cannot do.

And so all of these things impact whether or not you have sufficient nutrition or sufficient timing. And as those factors kind of start skewing again, energy becomes depleted and maybe it becomes depleted in your gut first and then it becomes depleted.

And maybe you have a genetic propensity for an issue with your heart and it becomes depleted there, or it goes into the brain or, you know, you feel the muscles.

It depends on the level of depletion, and it depends on kind of your genetic makeup. As to which direction it's kind of go. But since the cells all need it, eventually it's going to affect everything.

So I found really interesting because our main audience here is mast cell activation syndrome. Until very recently that was thought to be quite rare. And mast cell issues were thought to be covered.

And now we're looking at the epidemiological population. Studies are showing that we're we're dealing with between 9 and 17% of the general population, the general population, not even talking about the chronically ill who are dealing with MSL issues.

How common is thiamin deficiency, as you're describing it? And then let's talk about the different presentations and symptoms so people can know whether to start considering this for themselves.

Okay. So depending upon the study, population that is tested, thiamin deficiency can range anywhere in any given

population between ten and upwards of 90%.

So you see, you know, they did a random study in the UK of just anybody who walked into the emergency room, you know, broken arm, whatever. It could be anything. And it was 20%.

Diabetics are typically type one and type two diabetics typically have a higher incidence of it because they excrete it more frequently. And so it can be upwards of like 70% there in diabetic populations.

And when you think about it, I mean, is the entry to how we metabolize glucose being one of the major sources of fuel. And so if you don't have enough thymine, you cannot metabolize glucose into, you know, energy.

And so what happens to that glucose? It kind of floats around and, you end up with, insulin problems and everything else. So the the ranges are quite high depending upon the population tested.

But we don't test very frequently. Is the problem. So you talk to even you talk to patients today, who want to get a thymine test, who have clear symptoms of thiamin, neurological symptoms of climate deficiency, and the doctors won't order it.

And so now we have to talk about the testing problems. Yes. So there's a lot of problems with testing. And so the and that's those are some technical questions to answer.

But the difficult T with most blood testing is it's very sensitive to what you've eaten recently. And what your, your current, exposure to thiamin is.

So if you are supplementing a multivitamin or if you are eating a lot of highly fortified foods, it may show you're going to get a false negative. It's going to show that you are sufficiently, have sufficient quantities of timing when in reality that's just because you've been exposed to it, and it's not necessarily what's working in your body.

And what's been what we see in the blood is now it's happening in the mitochondria. So yeah. And so some of the tests that we would like to have run, are only available at two labs, one in the US and one in the UK.

Now, I've only found one lab that will run the eight TPA here in the United States. And there it's not available to consumers. It's not. Yeah. So it's it's virtually impossible unless you are severely and frankly deficient.

And there are again, there are patients walking around who by test current testing methods are severely and frankly deficient. Yeah. And yet they're walking around.

They may not be emaciated. They may not be an alcoholic. They likely have a lot of unexplained health issues. But no one has paid attention to the thiamin and they haven't gotten the thiamin just.

And or there are patients whose doctors have ordered thiamin tests who show franc deficiency, and no one does anything about it. Well, in my own case, I've seen hundreds of B1 tests.

I didn't know the testing issues. Yes, and I didn't know the, you know, the crime cycle. I know the cofactors, but I didn't know the extent of how this deficiency can affect these kinds of symptoms.

And I think this is where this is such an important conversation. Well, I think it's also in terms of how we define deficiency. So if we look at lab values, the lab values for thymine are like 6 or 7, all the way up to like I think it's 180 animals per per liter.

I can't remember the unit, but, it's enormous range. So if someone tests nine and a cutoff seven, you know, are they deficient? Technically, no. Do they have enough to to make their living, you know, to, to to perform the task of daily living in a, in a functional, healthy way?

Probably not. Similarly, if they have 100 or 150, does that mean that that is sufficient? Well, under technical, you

know, terms it does. But what if that individual is regularly exposed to things that that prevent the absorption of thiamin or break it down, or if they have genetic components that, affect how thiamin is transported and no one's paid attention to those.

So even though their levels appear to be, you know, within a range, they're still critically or chronically ill. And so it's not a deficiency in the sense that the, you know, you are either deficient or you're not.

It's how much does your body need for it to function? Well, yeah. And that's the question we don't ask enough. That functional view. Yeah. Even aside from the B1 blood testing having massive problems.

Yes. Now.

## Testing problems and functional deficiency

So as people develop deficiencies and this is what I want, our, our audience or our community members, if, if they haven't followed everything or time out to really hear this part, how does this show up for people?

Particularly, we see so much disorder. Nomi. Sensitivities, chronic fatigue, brain fog. But and you mentioned weight gain and a really, or weight loss, which is also problem this community.

And then I know there's a lot more you can add around that. Well, so let's back up just a little bit. So, remember we talked about, thiamin being critical for the production of energy in the mitochondria.

Okay. Now the mitochondria are basically your batteries, your cells, batteries. And they are in every cell of your body. And so if you don't have enough thiamin and if you don't have enough energy, the battery runs low.

Okay. Now that battery running low could happen depending upon your environment and your genetic makeup can happen in any part of your body. So the initial symptoms could be completely random.

You know, you could start having, you know, little twitches or some issues. You could start having a little bit of muscle weakness. You could start having GI symptoms are usually quite significant.

But once the deficiency has gone on for a little bit of time, you know, but it could start out of things that you don't quite look at as being a vitamin deficiency, you know, and so it may take months to build because think about how you consume your vitamins and minerals.

They're going to wax and wane relative to what you eat and relative to the stressors you experience. So while you may get a period where you're really low, life may intervene and you may get a period where you're sufficient, and then you flip back and forth, back and forth until at one point there's this like final straw and everything just goes to crap.

And it's like we can all relate to. Yeah, there is. And so whenever I talk to people, there's this assumption that they were healthy until, you know, I was healthy until.

And then when we dig in, it's like, when are you really healthy or were you just functioning better? You know, and it's often. No, they were just functioning. They were making do.

They were compensating because our bodies are remarkable. They're going to keep us alive no matter what we throw at them. And so we often find that that they were probably extended periods of nutrient deficiency across their lifetimes, but they managed to survive them because life is like that.

It's up and down and up and down. And so the symptoms in modern thiamin deficiency are symptoms of mitochondrial dysfunction. So if you look up any symptom of mitochondrial dysfunction, you find that every symptom under the sun can be considered mitochondrial dysfunction because of the way the mitochondria fuel every cell in the body.

So this seemingly huge diversity of symptoms, if you see a whole bunch of unexplained symptoms and it can't simply represent this person, has seven different disease processes going on, you know, all with, you know, 15 different symptoms.

You got to think mitochondria. And then you got to think that I mean and other nutrient deficiencies. So that's that's kind of the key. You got to get away from those late stage classical signs which, which are the, neuropathies in the legs.

The cardiovascular dysfunction and the, the neurological, the array of neurological symptoms, you know, the the brain fog, the the, memory issues, the the speech issues, the nystagmus in the eyes.

If you've gotten to that point, it's been going on a long time and or you had a severe, severe, abrupt illness that tanked you immediately. But either way, this is the later stage.

You've got to start looking at the earlier stages of this process when things are just not quite right. And you don't feel quite well and you've got a lot of weird little things going on, that means you've got some nutrient deficiencies.

Yes. And I think some of the, from reading your work, the symptoms that are really common, these populations are going to be the chronic fatigue, the brain fog.

We do see a lot of neuropathies. And then, as people have been getting started on the B1, they've been working on it for years. And then they come back and they say, oh my gosh, you know, that was the missing key.

So that's been exciting. It's of course not a magic bullet, but certainly. But it's an important bullet. Yeah. And then weight gain or weight loss, I don't get a lot of people that are at their ideal weight.

They either have too much weight or they can't keep weight on. The vomiting I have had has horizontal nystagmus for years, and I thought it was from a head injury.

And I just realized reading you work. Holy moly, I have not addressed this part. Well that's interesting. So and that's, that's that is one of the cardinal symptoms of thiamin deficiency is nystagmus.

A taxi is the other one. And for laypeople, I just want to say this. And staring. This is where the eyes dart back and the eyes move, bounce. Funny. And you can go online and YouTube and look at videos of nystagmus, and then you can have, a friend or a partner test.

You can even probably see it in the mirror yourself. But if you know when it's happening. But my husband does, and yeah, he's my. I'm compensating. Okay. So there you go. So.

And have a partner go look at the videos online and then have a partner and then look up a taxi online and, you know, drunken sailor walk different and disturbed a had that for years.

I can't exactly line I'm terrified of getting pulled over. And those are the key symptoms and that everyone is trained in. And that's why I don't understand why people don't see these.

Well, I don't think we identify I don't think it's ever happened when I was in a provider's office, but if you walked heel toe, though, would you? Can I walk heel toe?

Yeah. When you were, when you were low and timing. Could you walk heel toe? I don't without and I've had so many injuries so. Okay. Complicated. But but definitely those are some things people can look at.

## Symptoms and clinical presentations

What are what are some other I, I've really been looking at it in terms of the level of sensitivities people get and the role in nervous system firing and functioning.

Yeah. So we work a lot on limbic. We work a lot on vagal, in terms of improving the signaling. But now I'm at this level of okay, well, but what if we can't get it to fire?

Exactly. So you have to take a step down and say, what does it require to fire? Yeah. And it the most basic requirement is that it has sufficient energy and air.

And if it doesn't, then it doesn't matter what else you do. You're not going to fully resolve the issue. That doesn't mean that other treatments and, and therapeutics might not be needed.

And are there vitamins and minerals and other things? But you have to solve the energy deficit problem. And to do that, it absolutely requires timing and it absolutely requires magnesium to just so I say, magnesium activates the thiamin.

So if you are magnesium deficient, you can be functionally thiamin deficient because there's not enough to activate the timing and just explain to people that's working.

I don't know if we can technically call it a cofactor. Is it working as a cofactor? It's a cofactor. Yeah. So pending on the magnesium. And then that's again the order of operations.

We have to bring things on in terms of their dependents. Yes. And there's a big push in a lot of, natural health circles to do huge doses of magnesium, right out of the gate.

And I personally think this is problematic because if you look at the way magnesium works in the mitochondria, if you break it down to some of the technical things, it actually will cause a feedback loop to prevent the, the, certain enzymes from working, which shuts down the ability to produce the energy.

And so I am not a proponent of starting magnesium. First, I'm a proponent of starting thiamin first with magnesium. If you can tolerate not everybody can tolerate magnesium out of the gate.

We found that sometimes they need magnesium and calcium. They often will need potassium. Not necessarily in a supplement that they have to do it in a food unless they're down to multiple, you know, to, to a few foods.

And they're going to have to do an electrolyte drink, to get that. But because if you want to talk about order of operations, because thiamin sits at the entry points, I believe thiamin is something that you have to start to begin with.

If you start with magnesium or if you start with B12, which is a different pathway, or B9, or if you start with the yeah, yeah. Then you, you those are, those are or vitamins that use energy more than produce energy.

So then we can get into more of a deficit of the B. Yes. Which I think we see so much in this population is really helpful for people to hear because they get put on methyl folate, they get put on different forms of B12.

They can't tolerate it, they can't tolerate B6. Sometimes we tolerate B2 because B2 sits in the same enzyme as is thiamin does. And so it is kind of kicking that pyruvate enzyme and up a little notch in the crab.

So to transmit. Yeah, to get everything going. So it's at the top. Well, but same same, enzyme also at the top of thiamin is alpha lipoic acid. That's another one that people will take these high is a no no in the cells in thiamin deficiency again.

And and so you have to feed the mitochondria stuff that's going to make them produce energy rather than stuff that's going to utilize energy. Yes. That makes so much sense.

Now I know people are going to want to try starting this themselves. This is not the simplest thing to navigate. You know it is not. You've been invaluable in the exchanges we've been having around how to navigate with sensitive people.

But I want to give people some some practical tips and then encourage them if you're having trouble. You know, I know you talk, you do some consulting.

We we do consulting work with somebody who gets this so that you're not stuck in it if you're in trouble. But. Well, technically I don't do patient consulting, but yes, I do.

Okay, I know you do research, consulting, ag research consult. You do research. But I would encourage people. Firstly, I know I'll go into some of the things they need to consider, but I would encourage them to read our website, read the articles on thymine on our website on hormones Matter comm, read the case stories, particularly because you will see, yourself in some of them.

I guarantee it, and you will see how they, the individual patients had to approach it. And everybody's a little bit different. I think that's important to understand.

There is not I know there are people who put out protocols, and everybody wants a protocol. But I am fundamentally against protocol. We don't we can't do that.

But yeah, we have but we have a method. And so, yeah, this is in the very early there's a framework, there's this very early stages of our framework now, is the, is the timing bringing it on board.

So, so in, in so let's go back. So in supplemental I mean you have people who will do quite well on it early on. And those are the easy ones. They don't have any of those on here.

Yeah. Don't. And they're fine. And they feel great. They get an instant burst of energy and everything's wonderful. And, you know, it's a it's a semi linear trajectory to recovery.

Most people are not like that. Most people will have some sort of reaction to the extra energy. So again, let's go back to the mitochondria and the chemistry.

Perhaps in a simple way. You have mitochondria and then the cells in which they reside have been operating on low energy for an extended period of time.

And so in order to keep you alive, they have kind of changed their systems and their operating systems. They've they've, you know, upregulated some things down, regulated other things, you know, just kind of mixed it all up to keep you alive.

And they've got these different byproducts happening. Yeah. Yeah, different byproduct got all sorts of things that are going on. Now all of a sudden you're going to give it a jump start, you know, or give them a jump start and it doesn't go smoothly.

## How to start thiamin and supporting nutrients

It's like when you're jumpstarting an old car, you know, kind of sputters and shoots things out on a molecular level. All of those things that were rewound one way now have to be rewound.

Another way in the presence of that energy. And there are awful lot of hiccups. And those hiccups, can make all of your symptoms worse and present with a whole bunch of new ones.

And so there are a couple of ways to navigate it, if you are fortunate enough to work with a physician who can give you I. V. and do high dose and monitor you and give you all of the electrolytes, then go that way.

If you are not, which most people are not, you're going to have to start out at a low dose and gradually, sometimes extreme, slowly and extremely low doses titrate up over an extended period of time and slowly means, like we talked about, sprinkles little.

Yeah, you may get a milligram of thiamin in and you may have to sit at that level for weeks until everything settles down, and then you can go up to maybe a little bit more and then a little bit.

So it's a stair step. You take your dose and then you hold and then you pick a little bit more and you hold and so on and so forth. And you do that until you're up to a dose where things start improving and, well, things you help me with is often in this audience and in this community.

We'll have people do do a little sprinkle, wait 2 or 3 days and then do a little sprinkle. But in AB1 it's better to stay de annual and don't stop and start.

And stop and start. And also we can take the dose down if we need to make it more comfortable. But to find some way through. Yes. And most things if we start to have trouble with it, we come off of it in this, in this population.

But with the B1 it's not to go away. Even if we're so sensitive. We put a sprinkle like a few granules and one to that water all day long. That might be where we start.

It might be. Yeah. And that's, that's the that's the difficulty with this. If you take what you can handle and, and you hold at it now you also have to do that with magnesium.

Or if your diet allows up your magnesium content and your potassium content and your other things and diet, I like, you know, people drink coconut water, coconut milk, coconut cream, you can do things like that.

And that has, you know, a lot of the electrolytes in it, and that helps. And plus, if you get the cream, it's fatty acids, which are perfect, for you.

So you can do things like that, you can up your diet in the various electrolytes and just go online and look up and find foods that you like that have, higher concentrations of magnesium, potassium.

You'll probably need more salt, phosphorus. So phosphates or protein, and things like that. You can use the, the, the application, chronometer to enter the foods that you're taking so that it gets a good, pretty good micronutrient breakdown and you can see what's going on there and you'll be shocked.

I personally when I do it, I because I don't eat any processed foods or fortified, I don't eat breads or anything like that. I have very little I don't ever get folate in my diet, so I have to.

Yeah. So you'll find things where the, you know, you don't get enough of X or Y and you have to to work at it to get it. And this is where it can be helpful to have a guide to help you navigate what to bring.

Yeah, man. Let's talk about and wrap up with the three forms of thiamin because most people are going to go out for more. But yeah okay. This three that we like let's do all four.

But most people are going to go out and grab that thiamin HDL or they often tell me, well, I've got thiamin in my multivitamin for the ones I see that can take a multi.

And I'm like, but that's the thiamin h CL yeah. So the a couple forms. So the cheapest or at least expensive form is thiamin mono nitrate. And that's the one we tend to avoid because there's a whole number of reasons.

But that you'll see in a lot of the less expensive multivitamins and over the counter. So but don't get that one. The second one is thiamin hydrochloride, and that one is is a is a really good option.

And that's typically where most people have to start. And but it's not absorbed. Well. And it can be degraded easily. But it's milder because it's not absorbed well and it can be degraded is it's the form for sensitive people to start with.

Yeah. It is a form form for sensitive people to start with. So I would consider that one. As you get more along or if

you're not as sensitive, there are two more potent options.

The that I like much better, tempo, timing and timing. Well, the brand names are, Alice. I mean, like, both, I mean, and Thea. Max. It has a form called TFD.

I don't need to know what that stands for. We just know it. TFD, TFD, those those forms don't require transporters. So if you have gut issues and or you have problems with genetic problems with the transporters, they they cross the cell membrane without a transporter.

And, you know, they work. They're they're just more potent. And they cost less. They are more per your better. Right? Yes. And they do the blood brain barrier better.

Because they are more potent. They are difficult for some people to begin with. And they typically have to start with, thymine HDL, and titrate that up.

Now, if you can only try if you can only deal with thymine, HDL and depending upon your health issues, you may need a very high dose of thymine HDL because of again, the, the, absorption issues when they're just that high dose or.

Well, most people with chronic fatigue will need a 1500 to 2000mg of HDL. Now, that does not translate to 1500 or 2000mg of TFD events of timing. Just you need a fraction of of that.

They're not equal. But I mean, you may only need like 300mg or 1500 or 300mg of the TFD or three, the van for a tiny 150 to 300 of the benzo or the TFD versus 1500 or 2000 of the medium.

Okay. Got it.

## Forms of thiamin and practical resources

But again, if you're highly sensitive and chronically ill, which your population is, they may you may only be able to begin with like a milligram of thymine HDL.

And it may take you a long time to even get to 100. But if you don't react to it, if you start out on a low dose of HDL and you don't react to it negatively, then you could go up a little bit.

So you have to really pay attention to how your body responds to it in order to find your dose. And I recommend people track, you know, start a spreadsheet, write down your symptoms, rate in 1 to 10.

You know, and do this at least daily, if not multiple times a day, relative to the nutrients that you are adding, so that you can determine what's causing what and where.

There are improvements, because oftentimes there'll be improvements in areas that are not your primary symptoms, but they're still nagging symptoms. And they'll that's where it'll start.

And if you're not tracking, you don't notice. That's a great point. And one other piece I want to just put out there for people is we've been doing a start with a time in HDL called the Benford timing.

And there are people tolerate the TFT, but the place I found where we can't do the TFD is in hydrogen sulfide Sibo. And if we have a that, people may have to stay with the bean.

For some people it's just too strong at that stage. So it may take six months to 2 or 3 years even to build all of this up, depending on how slow in many cases it does.

If you depending on the time that you've been ill and the severity of your illness, it may take, quite some time. And that's, that's another thing, particularly if there are a lot of neuropathies involved.

Nerves regrow very slowly. And so it's not going to happen in a couple weeks. But that's why you've got to track everything to see what's going. But you've got it.

All of the systems have to rewind. And that just takes time. It takes time. And, patience is the key for every shot of patients in this population is difficult.

I want to really thank you for your work. For generously joining us today and sharing your knowledge. But your your work, again, has been a game changer.

And our practice has been a game changer for the clients we're working with. And I know we're going to continue to learn and grow with it. Thank you so much for what you do.

Can you remind people again of how to find you? Hormones, banner.com. That's our website with the all the articles Understanding Mitochondrial Nutrients.

That's the Facebook group. There's also the Facebook page for Hormones Matter where we post articles. And if you happen to be an old lady who lives or ladies with.com, I tell you, after I saw you, I've been working on these injuries for a long time and getting my strength back.

I love the exercise and I've been quite limited and when I saw you, one of my life goals is to be able to join the Facebook group now. Oh, we'd love to have you.

Yeah, our goal with lifting does. I'm at 1 pounds so I got a ways to go but I'm at 1 pound weights. I'm going to get there. Everybody starts somewhere.

That's the thing. Thank you again. It's so wonderful to have you. Oh, thank you for having me.