

A sunburst graphic with numerous thin, light gray lines radiating from a central point behind the text.

Healthy Moms Podcast

BY **Wellness Mama**[®]
simple answers for healthier families

Episode 142: Is Adrenal Fatigue Real or Just Bad
Science? With Ari Whitten

Child: Welcome to my Mommy's podcast.

This podcast is brought to you by Vivos. This is something we recently invested in for our entire family and we are absolutely loving it and here is why. So, data shows that the nutrition we receive in utero determines our palate development and how narrow or open our airway and jaw structure are. So a narrow mouth, jaw and airway increase the chances of needing braces, of getting sleep apnea, breathing difficulties and much more. But it was pretty much assumed that your jaw structure was set in stone once you were born or for sure after the first couple of years of life. But Vivos has found that not only is this not true, but they created a non-invasive, non-surgical, easy way of widening the maxilla, the jaw and the airway. So for our kids, this means that they get to avoid the braces that my husband and I both had and for my husband, this means his sleep apnea has disappeared and he stopped snoring, which is a bonus for me. I'll be writing more about this soon but you can check them out, in the meantime, at wellnessmama.com/go/vivos

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Katie: Hello and welcome to, "The Healthy Moms Podcast." I'm Katie from wellnessmama.com, and this is gonna be such a fun episode. I'm here today with Ari Whitten who is the number one bestselling author and creator of the Energy Blueprint System. He's an energy and fatigue specialist who focuses on taking an evidence-based approach to energy enhancement, and some of his opinions may actually surprise you. I think it's gonna be a fascinating episode.

For the last three years, he's been working with the world's top fatigue researchers to develop the most comprehensive program in the world on the science of overcoming fatigue and increasing energy. And I know I get a lot of questions from moms struggling with this. So, Ari, welcome and thank you for your time.

Ari: Yeah. Thank you so much for having me. And you know, I should also mention that I, myself, am a new parent. I have a one-year-old now. So, I know the struggles of being a parent and raising a kid. It's no easy task and it's definitely tough to maintain great health and energy with the little ones hanging on you at every second.

Katie: No kidding. Yeah, I think this is gonna be really helpful to parents who are listening for that reason, and congratulations on your little one.

Ari: Thank you so much.

Katie: So, I know that you are considered one of the top experts and you've done a whole lot of research when it comes to adrenal fatigue and the science of that. And I also know that your answer may surprise a lot of people. So, I'd love to jump in there even though it's kind of a big topic. What is your take on the science around adrenal fatigue?

Ari: Yeah. This is a big one and I think it's important to preface this whole discussion with kinda some context.

Probably, most of your listeners are coming from kind of being already in the natural health community. Maybe they've seen, you know, naturopaths and functional medicine doctors, and people like that, and they're kind of...they've probably read lots of articles and maybe some books on adrenal fatigue. And so, the idea that someone could be questioning that is actually kind of shocking. And probably, the initial reaction that many of your listeners have is skepticism. And probably, many people are thinking, "Oh, this guy's questioning adrenal fatigue? He obviously doesn't know what he's talking about."

So, with that in mind, I'd like to just kinda set some context for this, so people understand what the views are that are actually out there. So, there's basically two schools of thought when it comes to adrenal fatigue. And one is basically the whole kind of natural health community, holistic health, naturopaths, alternative medicine, functional medicine, integrative medicine, and they're very much into this kind of notion of adrenal fatigue. And maybe some of your listeners have even seen some of these people who've been tested for...you know, had their cortisol levels tested and maybe even have been diagnosed with adrenal fatigue. So, that's one school of thought, kind of holistic health.

Now, there's this other school of thought that many of your listeners may be unaware of, which is all of conventional medicine. And basically, conventional medicine does not recognize adrenal fatigue as a legitimate medical condition, and they basically scoff at...you know, if somebody mentions adrenal fatigue, they're like, "Oh, that nonsense." And basically, they don't accept it as a real thing at all. And there have actually been public statements issued by endocrinologists who are MDs, who are hormone specialists, who have come out and said, you know, "There is no such thing as adrenal fatigue. There are no facts to substantiate this, and this is not a real medical condition."

So, basically, these two schools of thought are, one, they're saying adrenal fatigue is real and we see people all the time who have adrenal fatigue, and we treat people with adrenal fatigue, and we can do cortisol tests and, you know, say that...you know, find where your cortisol levels are at. So, you know, we obviously know this is a real thing. And then, the other people, these endocrinologists are saying, "Hey, we also know how to do cortisol tests and there's no such thing as adrenal fatigue." So, what the heck is going on here, right?

There's obviously a gap in our understanding of what's happening here. So, my story, where I came into this, is that I actually was raised and kind of educated in the natural holistic health paradigm. So, I was raised with the idea that adrenal fatigue is real. I learned it. I read many books about it. I read hundreds of articles about it and I was teaching it for many, many years as a real thing.

So, interestingly enough, where I came into this was I saw conventional medicine kind of brushing off the whole thing as nonsense, and I had this idea that I was gonna go and look at all of the evidence, like actually go through all of the research and write a book that makes a scientific case for adrenal fatigue, and basically says, "Hey, all of you guys, conventional medicine docs, you're all wrong. This is a real condition and here's all the science to prove it."

And this was a few years ago that this happened. And basically, when I started to explore the research, something kind of interesting happened, which was that I felt...I saw that the research was really contradictory and they're just...you know, you'd find one study that showed high cortisol. One study showed low cortisol in people with chronic fatigue. Another one...you know, another three would say, "We can detect no differences in cortisol levels between people with, let's say, chronic fatigue syndrome versus normal healthy people." And it was just all kind of a big mess of contradictory studies.

And so, I kind of...at that point, I basically had a choice. My choice was if I wanted to write the book that I set out to write, what I would have had to do is cherry pick all of the data. And what that means is I would've had to select only the studies that support the notion that there are cortisol abnormalities in people with chronic fatigue and leave out all of the ones that say...that found that there were normal cortisol levels. I decided not to do that even though cherry-picking seems to be a very popular pastime of many of our peers, many, you know, diet book authors and so on. I didn't wanna do that.

And so I kinda left the whole thing alone and I kinda just sat in a space of like I didn't really know what to do with what I found because I wanted to write this thing, the scientific case for adrenal fatigue, and I've discovered that the science didn't support my preconceived notions. So, it's kind of been sitting there for a few years. And about a little less than a year ago, I had this idea that...I said, "You know what? Okay, if the science doesn't prove adrenal fatigue, maybe I should at least kinda let the world know what the science actually does say."

So, what I decided to do was go through every study that's been done on this topic and basically just...you know, after I do that and then kind of put all the pieces together, go through all the details of all the different studies, put everything together and make sense of it all, and then count, you know, how many studies were in support of particular cortisol abnormalities and how many studies showed normal cortisol levels. Basically, just put that data out there and say, "Here's what the science actually says about adrenal fatigue. And this is not my opinion. This is just...this is the body of evidence and you draw your own conclusions."

Now, there's one other aspect that I should add here. And first of all, let me check in with you because I've been talking here for quite a while. Let me just check in and make sure that you're following all of this, so far, and everything makes sense.

Katie: Yeah, absolutely. I think that people are maybe familiar with adrenal fatigue or the concept of it. And I think you're right, it has a very controversial history between conventional medicine and natural medicine. So, I'm fascinated to hear what the research said for you.

Ari: Cool. Yeah. And let me step back real quick and just mention for anybody listening who's not familiar with the concept of adrenal fatigue. Basically, to kinda sum this up, the idea is that our adrenal glands produce a stress hormone called cortisol. And cortisol has various roles in the body as far as helping to release energy stores as well as it has anti-inflammatory properties, and it does...it has a number of different roles in the body, but it's kind of primarily thought of as like a stress hormone.

And the basic idea of adrenal fatigue is that chronic stress, when you have chronic stress in the system, it sort of wears out the adrenal glands, and at a certain point the adrenal glands can no longer produce enough cortisol to keep up with the stress demands, and at that point, you are in adrenal fatigue or adrenal burnout, or adrenal exhaustion. And then as a result of those low cortisol levels, you then experience various symptoms.

And there are a whole bunch of symptoms that are claimed for adrenal fatigue. Obviously, chronic fatigue is probably the most important one. And then, some others are like hypoglycemia, poor sleep, weight gain, sugar cravings, salt cravings, things of that nature. So, anyway, that's adrenal fatigue. So, back to the story.

And when I decided to actually go into the evidence on this and release kind of this scientific analysis of adrenal fatigue, I had a little issue and the issue was that if you go on PubMed, which is basically like Google for scientific studies, you can look up basically all the research that's pretty much ever been done on that when you're...with just a few clicks of buttons on your keypad. When you type in, "Adrenal fatigue," into PubMed, basically, nothing comes up, pretty much no studies whatsoever. And that is...let me emphasize this a bit more because for listeners who are maybe not used to going and looking up studies on PubMed, they may not really understand how shocking it is what I just said, the fact that there are basically no studies on adrenal fatigue.

If you think of any medical condition, whether diabetes, Alzheimer's, Parkinson's, epilepsy, you know, any obscure condition that you can think of, you know, kidney cancer or whatever, think of any condition, I don't care how obscure it is. Go to PubMed, look it up, and what you'll find is that there will be dozens or probably more likely hundreds or thousands of studies that immediately come up on that particular condition.

Now, if you go and do...and you can do this right now. You can go to pubmed.com, type in, "Adrenal fatigue," in quotes so that it puts that whole, you know, phrase together, "Adrenal fatigue," and what you'll find, if you do that search, is that there's virtually no research in existence on adrenal fatigue. And in fact, as of 2016, it's actually worse than just a case of no scientific data because we now have negative scientific data. There's a 2016 systematic literature review of the evidence that's titled, "Adrenal Fatigue Does Not Exist." And I would imagine you could probably guess what they concluded, but they concluded that there's no scientific case for adrenal fatigue.

Now, when I first looked it up, there was basically just no research. That study wasn't there. So, I was...you know, and let me just emphasize this a bit more because there's an enormous gap here and this should be shocking to everybody listening. Because what we have right now is a situation where if you go online and look up, "Adrenal fatigue," you will find literally thousands of articles online written about adrenal fatigue with all sorts of seemingly, you know, very scientific-looking charts and things of that nature. And you will find even dozens of books written about adrenal fatigue claiming that this is a real medical condition and that it's easy...you can diagnose it via this cortisol test and that you treat it via this, this, and this. And there's all of this body of people talking about this thing and yet, if you actually look and try to find any science, there's basically no science to be found. So, that should be shocking to everybody listening right now.

Now, in order to actually do a review of the evidence on this subject, I was in a weird position, right? If I was gonna actually review all these evidence, and there's no evidence on adrenal fatigue, what the heck am I reviewing? So, here's what I eventually figured out. There are a number of other recognized, legitimate medical conditions that are actually...recognized medical conditions by conventional medicine, and they are chronic fatigue syndromes that have a huge amount of overlap in the symptoms with this concept of adrenal fatigue. And they go by a few different names. One is called burnout syndrome, another one is called vital exhaustion or exhaustion disorder, and then there's chronic fatigue syndrome. And there's a huge amount of symptom overlap between the symptoms claimed for adrenal fatigue and the symptoms of these different conditions.

Just to emphasize that a little bit more detailed, there have been surveys done of people with chronic fatigue syndrome where they basically just gave them...gave a group of people with chronic fatigue syndrome a list of symptoms and said, you know, "Do you have fatigue? Do you have, you know, joint pain? Do you have hypoglycemic episodes? Do you have difficulty standing up? Do you have swollen lymph nodes or sore throat

frequently? Do you have weakness and exhaustion after doing any exercise?" You know, a list of symptoms like that, all of the diagnostic symptoms for chronic fatigue syndrome. And then, they basically just charted the percentages.

So, in other words, you know, 77% said that they have swollen lymph nodes or a sore throat, and 83% said that they have hypoglycemic episodes, and 91% said they have trouble sleeping, and so on. So, just imagine, you know, a whole list of 15 different symptoms like that with percentages like that next to each one.

Now, here's the interesting part. This same survey has been conducted with people who either have been diagnosed with adrenal fatigue or suspect they have adrenal fatigue. A lot of people are really self-diagnosed. They kind of go on the internet and read something about adrenal fatigue and then they go, "Oh, you know, that sounds like what I have." So, this same survey has been conducted with people who suspect they have adrenal fatigue and the remarkable thing that they found is that the percentages are almost identical. Meaning, the percentages of people who suspect they have adrenal fatigue, who report having those symptoms, are almost identical to the people with chronic fatigue syndrome who are reporting those symptoms.

So, my point in saying this is that these three different accepted chronic fatigue syndromes actually do have a huge amount of overlap with adrenal fatigue. So, here's the cool part. While there is no research that I can look to, to do a scientific analysis on adrenal fatigue, there is actually a huge body of literature on these other fatigue syndromes and their relationship to cortisol levels. So, that's the whole thing about adrenal fatigue, it's that it's the idea that, specifically, the adrenals and cortisol levels are mediating all of these different symptoms, and especially chronic fatigue.

So, what you can do now is now this opens up a possibility to actually analyze the science and say, "Well, are these chronic fatigue syndromes and burnout syndrome, and exhaustion disorder and chronic fatigue syndrome, are they linked reliably with any kind of adrenal dysfunction or abnormal cortisol levels?" And what I did was I found through many, many, many months of research and going through all of these, all the studies, every shred of the relevant study that I could find, what I did was I put all of that research together. And then, I put...I lined it all up by date, and I took...it was over 60 studies, and so 60 individual studies and 20 systematic literature reviews, which are basically reviews of the existing scientific evidence, have been done since 1995 to 2017. And I put all of that research together and then I just said, "What does this evidence say? Is chronic fatigue caused by dysfunctional adrenals and abnormal cortisol levels?"

And there are a few basic predictions that we would expect to find based on the adrenal fatigue theory. If adrenal fatigue is a real thing and if it's truly the adrenals and cortisol levels that are the cause of these kinds of symptoms, then we would expect to find things like, you know, some basic predictions like, one, most people with these chronic fatigue syndromes should actually have some kind of cortisol abnormalities, especially low cortisol levels. So, do they actually...does the majority...do all of these people or, at least, does a majority of these people have cortisol abnormalities?

Number two. Do cortisol abnormalities relate to the severity of the symptoms? In other words, you know, people with more severe chronic fatigue should have more severe cortisol abnormalities.

The next one is, does fixing the condition and getting somebody who's chronically fatigued, helping them recover, does that fix their cortisol levels? Meaning, as a person's symptoms improve, do you see cortisol

levels parallel that improvement?

And the last one is, if low cortisol levels are truly the cause of this condition, then giving medication to raise a person's cortisol levels should fix the condition, for the most part, or at the very least, cause significant dramatic benefit. So, does all that make sense so far?

Katie: It does and I'd love if you could also touch on...because I know cortisol rhythms move throughout the day. It's not typically like a stagnant level. So, how does that play into all of this? I don't wanna derail you, but I'd love if you could touch on that as well.

Ari: Yeah, beautiful. So, great question. And I'm trying to...I'm intentionally trying to simplify a little bit just to make this more palatable. But basically, there is what's called the diurnal cortisol rhythm. And the way this basically works is that right after you wake up in the mornings, we see what's called the cortisol awakening response. And there is this dramatic, very abrupt rise in cortisol levels over the first couple hours of the day, and then it drops off. And we see this big downward slope that goes into the rest of the day and into the night, and then, you know, the next thing the next day.

So, when these studies are assessing cortisol levels, a lot of them do 24-hour cortisol tests. So, they'll assess morning cortisol levels, they'll also assess evening cortisol levels. Sometimes they assess cortisol levels at midnight, and so on. But the main thing that most of them look at is the cortisol awakening response. So, they do four different cortisol measurements over the first couple hours of the day and they chart that morning cortisol awakening response. And most of the abnormalities that they find are in that awakening response. And there's a whole bunch of nuances here, but that's the basic idea of how cortisol varies over the course of the day and how it's typically assessed. Is, really, it's largely focused on this kind of morning cortisol awakening response. That's where we're really looking to assess a person's cortisol levels.

So, basically, after putting all of this research together, 60 individual studies, 20 systematic literature reviews. Here's how this actually breaks down. This is what the evidence shows. Sixteen of 60 studies, 60 individual studies, showed low morning cortisol levels are associated with chronic fatigue or burnout, 12 of 60 studies showed that high cortisol levels in the morning are associated with chronic fatigue or burnout. And 32, a vast majority of studies, showed there are no detectable differences in cortisol levels between people with chronic fatigue versus normal, healthy, regular people without any problems.

So, that should be pretty shocking to everyone listening. And basically, you know...I mean, again, this is not...I'm not expressing my opinion on this. My goal here is I wanna present the data and this is what the data says. The overall body of evidence every study that's been done on the topic of the relationship of cortisol levels to chronic fatigue from 1995 to 2017, that's what they say. About, you know, 16 are in favor of low, 12 are in favor of high, and 32 showed no detectable differences.

Now, this should be a pretty shocking thing because if you've known anybody with, for example, chronic fatigue syndrome, this is a debilitating condition. This is a very serious medical condition. So, it is truly remarkable that you could take a big group of people with this very serious medical condition totally debilitated and, you know, there's all this hype around cortisol and adrenal fatigue, and everybody's saying it's all about cortisol and the adrenals, and yet, in a vast majority of those people, they will have no detectable differences compared to normal, healthy people in cortisol levels. Their cortisol will be perfectly normal.

Katie: Wow, that's really like...like you said, it's fascinating but also scary, especially for I know a lot of people listening have done research. My audience is very well read and very well researched, so they probably stumbled across the idea of adrenal fatigue. And I've heard from people who went to their doctor and were like, "I think I have issues with my adrenals," and the doctor would test them and say, "No, you're fine. It's all in your head." And I know that like with your research, I think that's what's gonna get people hope, is the next part you can explain. Because if it's not the cortisol or the adrenal function, then basically, what is behind this and what can people do? Because I think you're right that probably the wording is very poor and that adrenal fatigue is not a thing that's been scientifically studied, but people are obviously struggling with something. So, can you explain what that is?

Ari: Yeah, and great question. So, I wanna clarify something. So, when I'm questioning adrenal fatigue, I wanna be clear that I am not questioning whether a person's symptoms are real. So, if anybody's listening to this and they're like, "Well, I had my cortisol levels tested and I was told I have adrenal fatigue, and I'm chronically fatigued and, you know, it really is my adrenals. And so, you're wrong and you don't understand because if you're questioning, you know, the science around adrenal fatigue, you must just not understand, and my symptoms really are real."

So, let me be clear. Your symptoms are absolutely real. I'm just saying the science doesn't support the idea that it's your adrenals and your cortisol levels that are causing it. And I wanna answer your question, Katie, but there's one little nuance here with the cortisol stuff that I wanna add, which is...so, even if you have low cortisol levels in the morning, it is actually not evidence of, "Adrenal fatigue." It is not evidence that your adrenals have been worn out and can't produce enough cortisol.

And a few points on that, so one and even those people who have low morning cortisol levels, when they assess for total cortisol output over the course of 24 hours, it's usually normal, meaning there is no deficit in the adrenals ability to actually produce cortisol levels. So, even in the people who have low morning cortisol levels, their total 24-hour cortisol output is still normal in the vast majority of cases.

Now, another point is that even if you have low morning cortisol levels, there are actually a number of common lifestyle factors that will cause that without any actual adrenal dysfunction. So, just to name a few, being a night owl chronotype. If you're a night owl, which means, you know, basically, if you're...instead of a morning person, you're more of a night person. You tend to stay up late and wake up later. You will have lower morning cortisol.

So, let's say you and me, if you're a morning person and I'm a night person, and we're both perfectly healthy and we both do a morning cortisol testing routine tomorrow morning starting at 8 a.m., me as a night person, I will show up as low cortisol and you will show up as having normal cortisol levels. Not because I have adrenal fatigue, but just because I'm a night person.

Another common factor, antidepressants. Antidepressants have been shown to cause adrenal fatigue. Another one is night eating. So, if you tend to eat late at night, that will cause low morning cortisol levels the next day. And another very common one is actually poor sleep. So, just having poor sleep and, by the way, this is shockingly common in people with chronic fatigue syndrome, there's research estimating that about 50% of people with chronic fatigue syndrome have overt sleep disorders like sleep apnea or sleep movement disorder, and things like that, just having poor sleep will cause low morning cortisol levels the next day.

So, you don't need to have...this is not evidence of adrenal fatigue or adrenal exhaustion. If you have a poor night of sleep tonight, you're gonna have low morning cortisol levels tomorrow. And if you have a sleep disorder or sleep apnea, you're gonna have low morning cortisol levels pretty much all the time. Now, considering how common these types of things are in people with chronic fatigue or burnout, it's actually even more remarkable and even more shocking that the vast majority of the studies on cortisol levels and chronic fatigue still show that most people have normal cortisol levels. You get what I mean?

Katie: Yeah. That makes sense.

Ari: So, anyway, to answer your question, hopefully, people listening get the idea that the hype around cortisol is really overblown. So, what is the real cause here? Well, I believe that over the next 5 or 10 years, the attention is really gonna move away from the adrenals and cortisol, and it's going to shift towards mitochondria as the central player in all of this. And mitochondria are cellular energy generators. These are the little engines inside of our cells that take in carbs and fats, and pump out cellular energy in the form of something called ATP, which stands for adenosine triphosphate. But not important you remember that. It's basically just they pump out cellular energy.

Now, there's a number of new studies that have come out basically showing that mitochondrial dysfunction seems to be the big key to understanding chronic fatigue. And there's several key studies that have really shown this. There's work from Sarah Myhill who's an MD in the UK who pioneered a test called the ATP profile test, which was the first diagnostic test that objectively shows that people with chronic fatigue syndrome actually do have a very real abnormality, a very real dysfunction in their bodies. Up until then, it's often regarded by, you know, conventional medicine as, you know, maybe hypochondria because they oftentimes couldn't detect anything wrong in blood test. So, this was the first time they actually found something, "Okay, we can see in people with chronic fatigue, they actually do have this very real serious dysfunction at the mitochondrial level."

So, that was one big breakthrough. There's also been some breakthrough pioneering research done by a researcher in San Diego named Robert Naviaux who runs a lab for mitochondrial medicine, and he's done just so many amazing studies. But a couple years ago, he did one called the Metabolic Features of Chronic Fatigue Syndrome. And basically, this study did a comprehensive blood analysis of people with chronic fatigue syndrome. You know, so think of a standard blood test might have 30, 40, 50 different things that it measures. Well, this test that they use measures over 600 different metabolites in the blood.

So, it basically can create like a...this comprehensive like fingerprint for any different kind of condition that you test. So, you know, heart disease might show up as having, you know, these particular metabolites high and these low, and these normal. And then, another condition, Alzheimer's, is gonna have this particular pattern of high, low, and normal. And chronic fatigue syndrome, what they found was this huge number of abnormalities.

They found close to 80% of the metabolites that they measured were off. And specifically, they were pretty much all shifted in a downward direction. They were all low. And what that means is, and basically what the research concluded, is that the state of the metabolism in people with chronic fatigue syndrome is basically almost like a hibernation-like state. Essentially, all of the metabolic machinery, the mitochondria, the energy-producing parts of the cell, are being shut down. And instead of producing energy, the body is directing resources into kind of protection and into, you know, kind of this hibernation-like state.

So, here's the other big piece that puts all of this together. There was research also conducted by this guy, Robert Naviaux, who runs his lab for mitochondrial medicine, and I believe it's some of the most important research that's been done on chronic disease in the last 50 years. I think this is literally some of the most important research that's been done in decades, and there's a number of other practitioners who agree with me on that. And basically, he did a study called the cell danger response, and what they found is that mitochondria are not just these mindless energy generators that take in carbs and fats, and pump out energy, but they actually have this second role that almost no one knows about.

And this second role is that mitochondria play this critical role in cellular defense. And what that means is that their job is to detect when there's any kind of danger present or threat present. And then, when they detect that, a danger or threat present, they're job is to turn off energy production and switch into cellular defense mode or the cell danger response, as what he calls it.

So, to make sense of all this, to put the pieces together, basically, people with chronic fatigue have this downregulation of their, all their metabolic machinery and it's because their mitochondria are detecting some kind of threat shifting out of energy-production mode into defense mode, and into this kind of hibernation-like state. And we experience, you know, kind of the subjective experience that we have of our bodies going into that hibernation-like state is that we experience chronic fatigue.

Now, if this all seems like kind of heady theory, abstract ideas, let me just ground this in something practical. Think of the last time that you got a cold or a flu. What was one of the big symptoms that you felt? It was fatigue, right? So, that experience of just the last time you got an infection and feeling that symptom of fatigue, that is the cell danger response in action. That's what you were feeling. You were feeling your mitochondria shifting out of energy mode and into defense mode, and the fatigue that you felt was a reaction to that. So, that's essentially what chronic fatigue is. It is the symptom that we experience when our mitochondria are shifting out of energy mode towards defense mode.

Now, the one last thing that I'll kind of make sense of here is that this is not a mistake. This is actually a very intelligent response by our body that is actually a protective response that is for our own benefit. And to explain why, there are a number of different animal models that they found that would go into this kind of hibernation-like state where they downregulate energy production from the mitochondria in response to being in a stressful or toxic, or dangerous environment. And by doing that, by going into this kind of fatigued hibernation-like state, it extends their lifespan dramatically. They can live 50%, 100%, 200%, sometimes in some animal models sometimes 400% longer than if they were in a high-energy state.

So, the idea behind this protective response is that by going into this hibernation-like state, you can kind of survive longer in a toxic or a stressful environment and survive to the point where, hopefully, you are no longer in that toxic and stress environment, and now you can switch the engines back on and go into energy mode. Does all that make sense?

Katie: That makes perfect sense.

This podcast is brought to you by Vivos. This is something we recently invested in for our entire family and we are absolutely loving it and here is why. So, data shows that the nutrition we receive in utero determines our palate development and how narrow or open our airway and jaw structure are. So a narrow mouth, jaw and

airway increase the chances of needing braces, of getting sleep apnea, breathing difficulties and much more. But it was pretty much assumed that your jaw structure was set in stone once you were born or for sure after the first couple of years of life. But Vivos has found that not only is this not true, but they created a non-invasive, non-surgical, easy way of widening the maxilla, the jaw and the airway. So for our kids, this means that they get to avoid the braces that my husband and I both had and for my husband, this means his sleep apnea has disappeared and he stopped snoring, which is a bonus for me. I'll be writing more about this soon but you can check them out, in the meantime, at wellnessmama.com/go/vivos

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Katie: The question on my mind is, basically, how do we support proper mitochondrial function? I know I've seen some research on things like fasting or different types of light, but I know you have a lot of research here as well. So, if the mitochondria are the problem, what's the solution?

Ari: Yeah, great question. So, basically, the mitochondria are designed to detect all kinds of threats. So, they can detect threats in the form of things like toxins, like from pesticides in our diet or chemicals in the water supply, or household chemicals, or heavy metals, and things like that. Infections play a big role in shutting down the mitochondria. Things like leaky gut will cause chronic inflammation and leakage of certain type of toxin produced by bacteria from the gut to leak into the bloodstream constantly, and that will also poison the mitochondria and turn them into defense mode. We also have psychological and emotional stress that will cause a lot of these same effects.

And so, basically, there's a whole bunch of factors. Poor sleep and circadian rhythm; the 24-hour clock in our brains that regulates our sleeping and wake cycles. When that's off, that will also damage the mitochondria. So, the point being that it's multi-factorial and there's all these different factors, all these ones that I just mentioned including things like nutritional factors that all coalesce on the mitochondria and affect mitochondrial function. So, we can do things like, you know, simple thing that most people will be familiar with is, you know, enhance your sleep. You know, adopt sleep hygiene habits and circadian rhythm practices that help you sleep deeper and produce more melatonin at night.

So, for example, BluBlockers to block out artificial light in the couple of hours before bed. Not only is melatonin something that helps induce sleep, but it also has an integral role in protecting mitochondria from damage. So, if you're chronically not using BluBlockers and staying up late staring at electronic screens, you're suppressing melatonin. And as a result of that, chronically doing that, you know, on a daily basis for months and years, you are now weakening your mitochondria and making them highly susceptible to damage. You're making them very fragile. So, sleep and circadian rhythm is a big part of it, healing your gut so that you don't have chronic release of toxins into your bloodstream and chronic inflammation as a result of that.

Combating inflammation, in general, is a big factor. You alluded to red light and near infrared light a minute ago when you asked this question. That's another big factor that can improve mitochondrial health. And so, the fact that we're living very indoor lives and not spending time outdoors, not getting nearly enough sunlight, and we're all vitamin D deficient, but we're all more than just vitamin D. We're all sunlight deficient. And there are things...there are benefits that we get from sunlight exposure that go beyond just vitamin D. And red light and near infrared light is a big part of that, and these things directly impact mitochondrial function and mitochondrial energy production. So, when you don't have that, your mitochondria are basically chronically operating in a state where they're not producing as much energy as they should be.

Then, we obviously have nutritional factors. There's a whole bunch of different nutritional factors that relate to mitochondrial health. Just to name a few, things like phospholipids in the diet have shown to have remarkable benefits on protecting mitochondria from damage. Things like D-ribose, acetyl-L-carnitine, alpha-lipoic acid, and then things like astaxanthin have a massive important role in protecting mitochondria from damage.

Now, astaxanthin is this pink pigment that's found in things like salmon and salmon eggs, and in krill and shrimp, and lobster, and things like that. Astaxanthin is a very, very powerful way to protect your mitochondrial membranes from damage and allow them to be strong and resist stress so that they don't get damaged and then get triggered into danger mode, okay?

So, you know, that's to name a few. There's also neuroscience angles to combat stress and anxiety. And then, there's one more big one which you also alluded to, which is called hormesis. And hormesis is my personal favorite topic and it's basically the concept of a metabolic stressor that... And let me just go into that for a moment because people hear this word "stress" and they immediately have a negative association with it. They think stress is bad, "I have to avoid stress."

Well, this is the concept that certain types of metabolic stressors can actually create benefits. They can stimulate our bodies to adapt to that stressor. And by doing that, it actually makes us more resilient. And specifically, at the mitochondrial level, it makes our mitochondria bigger and stronger, and they build up their antioxidant and anti-inflammatory defense systems to protect themselves against damage.

Now, if that sounds really abstract, most people listening to this, well, everyone listening to this, is already familiar with this concept and they just don't realize it because exercise is actually a type of hormetic stressor. That's how exercise works. So, the reason that we have this huge body of thousands of scientific studies showing that, you know, exercise protects against all sorts of different diseases and cardiovascular disease, and different kinds of cancer, and neurological disease, you know, the reason...and extends longevity. The reason that exercise does all of that is not because it's intrinsically beneficial, but because it's actually a stressor. And by temporarily stressing the system in that way, it stimulates the body and especially the mitochondria to grow stronger and become more resilient.

And here's the cool part though. It's not just exercise. There's a whole bunch of other hormetic stressors that most people really or don't know about, or don't realize are working via this mechanism by being a temporary metabolic stressor. So, one is intermittent fasting. Another one is actually red and near infrared light, also works through hormesis, UV light from the sun, works through hormesis.

Many different kinds of phytonutrients work through hormesis. They're not, as most people think, just

antioxidants. They're actually plant toxins that create a temporary metabolic stress and then stimulate our internal antioxidant defense system to grow stronger. So, they're not just like vitamin C and vitamin E acting directly as antioxidants, but they're making your mitochondria and your cells more robust and resilient by building up the internal antioxidant defense system.

Then, we also have things like...I'm not sure if I mentioned intermittent fasting. And then, we also have things like cold and heat exposure. All of those different things work as hormetic stressors. They work to build up your mitochondria bigger and stronger.

Now, here's how...well, actually, there's one important linking thing that I'll mention. When you don't do those things in your life and most people do not do most of those different hormetic stressors I just mentioned, when you don't do them, your mitochondria shrink and shrivel and atrophy very much like if you've ever broken a bone and got a cast on, very much the same way that your muscles will atrophy when you don't use them because they're in a cast.

So, there's actually research showing that between the ages of 40 to 70, most people lose half their mitochondrial capacity. Now, here's why this matters, to connect the dots with this whole concept of the cell danger response that I mentioned before, and this kinda shift into hibernation mode. When your mitochondria are small and weak, and fragile, they're much...it lowers what I call your resilience threshold. In other words, it lowers the level of stress that your body can handle, and it makes your body more fragile essentially, and it makes it so...it's much more easily overwhelmed by stressors that now trigger it into defense mode and trigger it into this hibernation mode, chronically fatigued state.

And on the other hand, if you have big, strong healthy mitochondria, you raise your resilience threshold and you make it so these different stressors that we all encounter in life are things that your body can cope with. They can easily handle them and they're not triggered into defense mode. So, having big, healthy, strong mitochondria is key to have a strong resilience threshold and to make it so that your mitochondria are not triggered into this defense mode and into this hibernation fatigued state.

So, basically, what this whole thing is about is that a combination between having weak, fragile mitochondria combined with lots of different kinds of stressors, chemical stressors, toxins, infections, leaky gut, inflammation, stress of various kinds, that creates essentially the perfect storm to trigger your mitochondria into defense mode and keep them locked in a chronically fatigued state.

Katie: That makes perfect sense. And I'm glad you mentioned antioxidants because I know you have an interesting theory on this as well. Most people assume it's pretty well established that, you know, we have free radicals. Those cause aging and all kind of problems. And antioxidants, like, go in and fight the free radicals and fix the problem. But you have a different theory on this. Can we talk a little bit more about antioxidants before we move on, too?

Ari: Yeah, absolutely. So, basically...well, so, first of all, I will mention that it's not really my theory, actually. My take on this is not fringe at all. My take on this is actually the mainstream view, within the scientific community, believe it or not. And this is another area where there's just a big gap between what's commonly believed in the general public and the science.

So, we've had this idea of floating around for over 50 years now that's called the free radical theory of aging.

And people may not know it by that term, but people know the basic idea of it. The idea is that free radicals or oxidants are bad and that they cause damage in our cells, and that we essentially age and get diseased to the degree that ourselves have been damaged by free radicals. And therefore, antioxidants, things which neutralize these free radicals, are beneficial. And this is a basic idea. It's integrated into all of our thinking, you know. Millions of people all over the world subscribe to this idea and we all accept this as just, you know, these are basic facts, these are known. The science has proven this and validated it for a long time.

Well, people might be shocked to learn that this theory has actually pretty much been discarded by aging scientists because there's a huge amount of data that contradicts this theory. So, real quick, there's been a number of studies that have basically shown...well, actually, sorry. Let me explain this more systematically.

If the theory, the free radical theory of aging is true, if the idea that free radicals are bad, antioxidants are good is true, there's two basic predictions that come out of that theory. One is that antioxidants should be good. So, if you supplement with things like vitamin C and vitamin E, and vitamin A, it should help prevent disease and extend longevity. Very basic prediction, it comes out of that theory. The other basic prediction is that doing things which promote, which cause the generation of free radicals, should be harmful and should accelerate the aging and decrease longevity, and contribute to many different diseases. So, these are the two basic predictions.

Now, it turns out there's a huge body of evidence that doesn't support either of these predictions. The biggest meta-analysis, the biggest systematic reviews of all the research that have been done on supplemental vitamin C, vitamin E, and vitamin A, and beta-carotene, have shown over and over again for decades that these things do not actually extend longevity and do not reliably help prevent things like cardiovascular disease, and cancer, and diabetes, and numerous other diseases.

And for anyone who is skeptical of that idea, who is convinced that, you know, the supplemental vitamin E and A, and C, are really benefiting them, feel free to go and look at the research yourself, and you can assess whether I'm wrong. What I suggest is look for the systematic literature reviews because that's where all of the research will be lumped together and you can get a quick review of all of it. And there have been numerous of those that have been done over the last couple decades. They're very consistent that antioxidants do not prevent disease or extend longevity.

Now, the other thing is that doing things which cause the generation of free radicals should be harmful. Now, that seems like a very obvious thing that it should be the case. But let me give you an example of something that creates free radicals in your body. Exercise, intermittent fasting, red light, UV light, cold exposure, heat exposure, basically all of the different types of hormetic stressors including...especially exercise, create more free radicals in your body. So, that theory predicts that if you do stuff that creates free radicals, it should cause disease and lower lifespan when, in fact, the research shows it does the exact opposite. It actually helps prevent disease and extends lifespan.

So, this is why most researchers, the aging scientists on the planet have discarded the free radical theory of aging. And basically, it turns out that what's really going on, and I know we only have a couple minutes so I'll try and explain this very quickly, it turns out that what's really going on and what really matters is, yes, oxidative damage at the cellular level matters, but it's not just a simple matter of taking antioxidants and avoiding things that are bad. It turns out that what's really critical here is to build up your internal antioxidant defense system.

We have this system built into our cells called the ARE, Antioxidant Response Element, and the way that this works is that by engaging in different types of hormetic stress like all the ones I just mentioned, exercise, cold, heat, fasting, and so on, also plant phytochemicals are another big factor that do this, what they do is they create a temporary metabolic stress that like builds up free radicals temporarily. And by doing that, it stimulates your antioxidant response element, your internal antioxidant defense system, to grow bigger and stronger, and more robust.

Now, antioxidants, on the other hand, if you supplement with lots of antioxidants, synthetic, you know, isolated antioxidant supplements, vitamin C, vitamin E, beta-carotene and things like that, rather than whole foods, those will actually have the opposite effect. Your body will basically say, "Hey, we don't need to ramp up our internal antioxidant defense system because we're being supplied by, you know, a whole bunch of antioxidants."

So, the real key here is for prevention of disease, for extending longevity, and for building up big, strong mitochondria that produce lots of energy is to layer many different types of hormesis into your life to build up your mitochondria to be bigger and stronger, too. Actually, you can also build new mitochondria from scratch, something called mitochondrial biogenesis, and you can build up their internal antioxidant and anti-inflammatory defense systems. And that's where it's at. It's not about just taking a bunch of pills that do the work for you. It's about building up your internal mitochondrial defense systems to be bigger and stronger and more robust, produce more energy, and live longer.

Katie: That's perfect. And I usually ask at the end like what advice would you give to kind of pull everything together? I know you have a whole system on this and we're gonna link to that in the show notes at wellnessmama.fm, but I like to always end with something really practical. So, I'd love to hear like what advice you would give to someone who maybe does struggle from these symptoms and thought that they had adrenal fatigue, and now understands this in a different way? What would you give them as starting points?

Ari: So, the way my system is built, The Energy Blueprint is built, is I take people through six very systematic steps and this has been refined over, you know...working with over 3,000 people with chronic fatigue. And the way I take it through the six steps are, first, we address circadian rhythm and sleep, build a really, really powerful set of circadian rhythm and sleep habits to build up that foundation because that's where cellular regeneration is really gonna happen, while you're sleeping.

The next one is all about nutrition to support mitochondrial health. The next one is all about light therapies, and there's a whole bunch of benefits of different kinds of light. That's really important. And then, we get into healing the gut. And then, detoxing and boosting liver function, getting the toxins out of the cells. And then, we get into the neuroscience around decreasing stress and anxiety. And then, we get into layering hormesis into your life to build up your mitochondria bigger and stronger.

So, that's basically the six steps, six very systematic, progressive steps that I take people through to overcome fatigue and get their energy back.

Katie: I love it. And for anyone listening who wants to hear more from you, can you let them know where to find you online so they can do more research? Of course, the links will be in the show notes, but for anyone listening, let them know where to find you.

Ari: Yeah. You can go to theenergyblueprint.com and there, you will have the opportunity to enter your email and sign up for my free training. It might be taken down relatively soon. So, if you listen to this podcast, make sure you go and do it immediately because I only launch the course at certain times of the year. And so, it may not be available if you're listening to this podcast too late. So, theenergyblueprint.com. And some people sometimes hear that and they go to energyblueprint.com. Make sure you go to theenergyblueprint.com.

Katie: Got it. And once again, those links will be in the show notes at wellnessmama.fm. So, if you are listening, you can go back and reference them later. But, Ari, thank you so much for your time. You explained that exceptionally well. You're so well spoken. And I appreciate your time and being here with us.

Ari: Thank you so much, Katie. It was an absolute pleasure and I'm so looking forward to having you on my podcast.

Katie: I can't wait. Though we may have to do a round two one day if there's questions because I think this is such an important topic. And again, I really appreciate your time, and I appreciate all of you for listening. Thank you so much for being here, and I will see you next time on, "The Healthy Moms Podcast."

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