Recharge Tactics: Enhance Mitochondria To Fight Fatigue Transcript

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Introduction and Ari Whitten's background

Welcome to this episode of the PCOS SOS Summit. I'm your host, Dr. Felice Gersh. With me for this episode is a really interesting individual who I met over a year ago, and I have really followed what he's been doing and it is so amazing.

His name is Ari Whitten. He is a specialist in a unique field of mitochondrial health and energy, which, by the way, for all of you out there with PCOS, is really this is critical knowledge for you because women with PCOS have issues with this.

So welcome, Ari. Thank you so much for joining me. This is really special to me that I got you on my show because I know you have so much great information to share.

But first, start by sharing your own journey and how you got to this area of expertize. And then we'll do a deep dive into what mitochondria are and all about energy.

Mm hmm. The very brief version of my story, because I know we have a limited time, so I want to maximize this for the listener to make sure I deliver a lot of valuable information.

The very brief version of my story is health. Science has been my passion since I was 13 years old and the origins of that were really in the realm of fitness and bodybuilding and enhancing athletic performance.

And that was my world, really, up until my mid-twenties. So I was an aspiring bodybuilder, I was an athlete, I was a soccer player, I was a martial artist.

And and then I, I went into the fields of nutrition and exercise science for my undergraduate degree. I went on to become a personal trainer and certified nutritionist.

And then in my mid-twenties, something happened that really changed my trajectory from the world of fitness and body composition and athletic performance.

And it was that I got mononucleosis from Epstein-Barr virus and I got hit very hard by it. So as a as a kid, really, and as mid-twenties, who had been extremely fit and healthy and highly energetic up until that point, this really rocked my world.

And I was left for about a year with pretty debilitating chronic fatigue after this. So in the process of that, I sought out a lot of conventional doctors and a lot of alternative and functional medicine doctors.

And initially, I would say the conventional medical doctors. Well, first of all, they missed diagnosed me originally with having strep throat and put me on antibiotics, which obviously didn't help.

And then when it came to chronic fatigue, really didn't have much to offer. Functional medicine doctors, alternative medicine doctors, really. Everybody was saying adrenal fatigue, adrenal fatigue.

And that was initially a compelling diagnosis to me. And then what happened was, given that I have a strong science background, I started exploring scientific literature.

And what I stumbled across initially was that the conventional medical doctors really brushed off this whole concept of adrenal fatigue and they said, This is nonsense, this is pseudoscience.

There's no such thing as adrenal fatigue.

Rethinking adrenal fatigue and chronic energy loss

And me coming from more of a natural health orientation, you know, exercise, nutrition, that's that's my background. True natural health. My bias was to be in the direction of the natural health and functional medicine doctors who were telling me about adrenal fatigue.

And I had personal mentors even, and people who I admired greatly, who had authored books and written articles and made videos on adrenal fatigue. So I was very identified with this diagnosis of me having adrenal fatigue.

That's what explains my symptoms. And then I started to explore the primary literature, and my initial intention with that was to actually write a book essentially proving to conventional medicine that adrenal fatigue was real.

So, you know, I was going to kind of stick it to them and say, like, here's the science underlying this whole thing of adrenal fatigue. You guys are wrong for brushing this office pseudoscience and quackery.

So I started going into the primary literature and first of all, I found almost no research on adrenal fatigue at all, which is sort of a red flag because, you know, you can you as you know, you can look up pretty much any obscure medical condition and find at least dozens, if not hundreds or thousands of studies on it.

You look up adrenal fatigue. There's almost nothing. Then I started to find out other ways of exploring this. So cortisol or adrenal function, HPA axis function, hypothalamic pituitary adrenal axis and cortisol levels and stress or and fatigue or chronic fatigue or burnout syndrome or vital exhaustion or.

There are several different names for the stress related exhaustion disorder, chronic fatigue syndrome right now. And if you type in those search terms, plus cortisol or HPA axis function, then you start to bring up studies.

And as I started to go into that body of literature, I would find studies that didn't match my biases and what I expected to find. I found studies that showed, hey, in this group of people with burnout or with chronic fatigue syndrome, cortisol levels were normal or cortisol levels were high instead of low, like would be predicted by the adrenal fatigue story.

And eventually I was kind of I kept wanting to cherry pick the literature and, you know, use only the studies that supported my biases. But I found so many studies that contradicted my biases that eventually I said, you know what?

What what I need to do here is find every study in existence on this topic that has ever been done on the relationship of cortisol, an axis function with the symptom of fatigue, and figure out if this whole adrenal fatigue thing is real or not.

And that's what I did. And it took me over a year of essentially full time work to find all of those studies and lay them out in a in a comprehensive literature review.

And at the end of the day, basically the very short version, we can talk in detail about this if you want, but the very short version is that the overall body of evidence, number one, does not support that adrenal fatigue is the main driver of the symptom of fatigue or chronic fatigue, and it doesn't appear to be a major regulator of our energy levels in the vast majority of and the vast majority of people who have the symptom of chronic fatigue have no detectable abnormality in adrenal function at all.

And number two, the literature doesn't even support that. Adrenal fatigue is a real thing. So and you know, I've done hours of lectures just on those two statements I just made.

So I'm summarizing a year of my life here very succinctly. But at that point, basically what I did was, okay, well, everything that all these doctors seem to be saying about what controls our energy levels, you know, conventional medicine has basically nothing to say about chronic fatigue.

Alternative and functional medicine says it's adrenal fatigue. Science doesn't support it. And then I said, well, now that I'm so interested in this topic of what regulates human energy levels, maybe I'll spend the next several years digging out the science and kind of uncovering the actual science of what regulates human energy levels.

And that's what I've been doing the last ten years. Well, I love that story because obviously nothing would deter you from your mission to really understand for yourself and for others.

So let me just ask, because I want to have resolution to your story. You look great to me. How's your energy level Ari? Awesome. I just turned 40. I'm. I'm in the best, best shape of my life and I have amazing fitness and energy levels.

Yeah, I'm in exceptional health. Well, I am so glad that met with my observations of you now energy I always talk about it's like really the spark of life.

I mean, what differentiates life from non life is energy. So maybe you could just talk about that. I mean, if we get down to like the basics because I want everyone out there with PCOS, I can tell you you have low energy, you tend towards fatigue and mood disorders and I'm going to tell you a little bit more as well, but I want to hear from you, Ari What does it mean to have energy to make energy in a in a body?

Mm hmm. Yeah, great question. I like the way you phrase that. So you know where my search led me after I said, okay, I guess it's not the adrenals that are controlling human energy levels.

So what is? I started going down all these paths of, you know, I had a background in nutrition. I said so, so, okay, so what's the science, the mechanism is the physiology of how nutrition relates to this story of energy.

And I spent months and months and months digging out that science and figuring out what, you know, the different hormonal mechanisms and blood sugar and and, you know, all kinds of how it affects inflammation and gut health and brain health and all kinds of things.

I knew I was enamored with circadian rhythm and sleep. So what? And of course, sleep is related to the energy story, but what are the mechanisms? And I spent months digging out that science.

I had a background in exercise science. And we all know that exercise is related to this story of energy levels. But but how? What's the physiology? So I spent months figuring out what are those physiological connections between exercise routines and physical energy levels and so on and toxins and gut health.

And you know, all these different topics that I would spend months and months on. And eventually, after several years of building this out, I had a list of like 150 different physiological mechanisms that are in one way or another influencing human energy levels.

But it wasn't really until I found the work of Dr. Robert Nabeel, who runs a lab for mitochondrial medicine at the University of California, San Diego.

Mitochondria as energy generators and environmental sensors

And he had done some what I consider to be seminal research on what he termed the the cell danger response. And the cell danger response centers around the mitochondria of our cells.

These are what we all learn in high school and college biology classes, graduate school biology classes. This is the powerhouse of the cell, remember?

That's what we're supposed to check on. Our multiple choice exam, which organelle is the powerhouse of the cell. It's the mitochondria. And we're all taught about these mitochondria.

Even at at the graduate level, in physiology courses, we're taught about mitochondria really as sort of mindless

energy generators of the cells they take in carbs and fats.

They pump out ATP. We're taught to memorize the citric acid cycle, the Krebs cycle, glycolysis and all, and the different complexes of mitochondria and the electron transport chain and this process of how it produces ATP.

But for most part, for the most part, the framing is as mitochondria, as mindless cellular energy generators. And Dr. Nave, you really shift shifted this on its head because he integrated many decades of research by researchers all over the world showing that mitochondria were much more than this.

They they had a much bigger role in human physiology than simply taking in carbs and fats and pumping out energy. Because if that were the case, we have to understand solving fatigue would be very easy.

You just tell people to eat more carbs and fats. Right. And but in fact, that's not how energy works. Eating more carbs and fats, actually, for most people is likely to make them more fatigued, not more energetic. So what what Navya, Dr.

Nabi said was mitochondria are the central hub of the wheel of metabolism. And metabolism is not just a term in the way that most people know it as something related to weight loss, which is the way it's used, is really synonymous with resting.

Metabolic rate metabolism means all of the chemical reactions that occur in our entirety of our physiology. Okay, that's what the word metabolism means.

And what he's saying is mitochondria are at the core of that. They're at the center of the wheel of metabolism. And specifically what his work really gets at is that mitochondria are not just cellular energy generators.

They actually have two roles. One is as energy generators and the other one is as environmental sensors. They're essentially like the canaries in the coal mine of our body that are constantly asking the question, is it safe for us to produce energy?

And they're taking samples. They're taking they're testing what's going on, the signals from the environment, what's going on in the body. And they're asking the question, are we under attack?

Is there is there stress or is there danger to the body? And to the extent they're picking up on danger signals, they are shifting the cells out of energy mode, out of energy production mode towards cellular defense mode, what he calls the cell danger response.

He also calls these two modes. I call them energy mode in defense mode. He calls it peacetime metabolism and war time metabolism. Okay. Now, it's it's not an on off switch.

It's more like a dimmer switch. So the key thing to understand here is these two roles are mutually exclusive. So to the extent that your mitochondria are being are sensing the presence of danger or threats or stress signals, they are turning down the dial on energy production and shifting resources towards cellular defense.

And as as the center of the hub of the wheel of metabolism, as sort of the most upstream thing that's regulating it, you can think of like a car as an example.

There are many, many components of a car that are necessary for that car to work. Okay? The engine block, the pistons, the tires, the wheels, fuel in the fuel tank, spark plugs, oil, you know, on and on and on.

But what is the thing that's most upstream that is actually controlling whether that car is driving down the road or whether it's at a standstill and that's the human in the car that's pushing the accelerator pedal or the brake.

So in other words, lots of things are necessary for something to have a particular function. But what is the thing that's actually regulating the function?

And it turns out that mitochondria in the human body are very much the most upstream thing that tends to regulate or have a regulatory impact on lots of other things in the body.

And certainly this is true when it comes to the story of of energy levels. So to summarize all that, basically, we can think of our energy levels as as a parallel as as a function of to what degree our cells are operating in peacetime metabolism or wartime metabolism.

Well, that is a really very fascinating approach to mitochondria and understanding them on a much deeper level. Then, like you said, many people even in the field of medicine understand mitochondria to be.

Now, mitochondria are very, you know, critical to cellular health. So maybe you could help people to understand what are some of the biggest threats to might or congeal well being say you know nutritional deficiencies or endocrine disruptors or what do you see as the biggest threat because we want to nurture our mitochondria.

And then secondarily, what are the best ways to maintain healthy mitochondria? Yeah, great questions. Okay. So there's all answer in a few layers. So first of all, within conventional medicine, there's there's almost no attention paid to mitochondria or trying to modify them.

So the realm of talking about mitochondrial function and trying to modify this is squarely in the realm of natural health and functional medicine. Even with that said, I still believe that most people in functional medicine are missing half of the picture.

Okay, so here's here's the half that is sort of widely understood and acknowledged. Mitochondria can sense danger signals of various kinds, threat stresses, and in response to them, they turn down the dial on energy production or end or get physically damaged by those stressors.

Okay. And this is often under the umbrella term mitochondrial dysfunction. I don't like this term and I'll tell you why soon. As far as what types of stressors and danger signals mitochondria can sense, it's basically everything they can sense pretty much every type of stress imaginable from toxins of various kinds environmental toxicants to poor diet to sleep deprivation to physical overtraining over exercise, to chemical stressors, to psychological stressors, to pretty much everything that you can imagine.

And there's there's a field, just as an example of this called mitochondrial psychobiology, where there's a whole body of literature on how psychological stress, what's going on in the mind affects what's going on in your mitochondria, throughout your body, within a matter of seconds, 2 minutes. So they can sense what's going on everywhere in your body.

And it's it's not like you have stuff going on in your mind that's disconnected from your mitochondria. They are they're intimately intertwined, intertwined, communicating in seconds.

So every type of stressor we can think up, if you're an athlete and you're physically overtraining, if you have a respiratory tract infection, if you're exposed to mold or other toxins, if you're smoking and drinking, if you're eating a bad diet, if you're not sleeping enough, you don't have the right light.

Exposure signals for your circadian rhythm to function. Well, it's sensing all of that. And this is not because mitochondria come equipped with a sensor for every type of toxin, all of the thousands of different types of toxins or a sensor for psychological stress or a sensor for leaky gut or a sensor for, you know, every type of stress imaginable.

It's it's because all of these different types of stress ultimately converge on a few different systems, oxidative or nitric acid of stress or increasing inflammatory cytokines or causing physical damage.

And usually those things are very much overlapping. They tend to go together and to the extent it's sensing those signals, it knows that the body is under attack or under under threat or under in stress of some kind.

So to the extent that those signals are at a level that's chronic or at a level that is exceeding the capacity of the system to handle that demand, then it will tend to switch out of energy mode, into defense mode, and you will feel the symptom of fatigue.

So as an example, if you physically overdo it with exercise and you do way too hard of an exercise, exercise routine, what's going to be a classic symptom of that later that day?

The following day, you're going to have much lower energy levels. If you get a cold or a flu or COVID or something like that, classic symptom low energy levels can.

Threats to mitochondrial health and the role of stress

And there's lots of examples of of this, you know, in every type of stress that you can think of. So the way that this is framed in in functional medicine is generally in the context of mitochondrial dysfunction.

And it's framed as, you know, these different types of stressors, basically damaging the mitochondria or due to nutrient deficiencies. The mitochondria don't have their cofactors that are needed for mitochondrial energy production.

And so the way we correct mitochondrial dysfunction in this way is, is basically we get supplements, we get B vitamins, alpha lipoic acid, coke, you ten things, things of that nature.

And and we try to hopefully your practitioner goes beyond just the mitochondrial supplement step and also tries to address some of these stressors in your life that are overwhelming the mitochondria.

Okay. And that is an important part of the picture of mitochondrial health, but it's only half the picture. Here's the other half that that most people are unaware of.

When we look at the average seven year old, we find that and there's numerous lines of evidence to show this. We find that they've lost about 75% of their mitochondrial capacity.

And and there's two factors at play here. One is the amount of mitochondria Purcell is cut in half as people get to about seven years old. And the mitochondria that are still present are have usually shrunk and shriveled up and have only about half the capacity of more youthful, healthy mitochondria.

So you do the math on that. Basically, it's an average of about 75% loss of capacity. This is not a small deal. This is a huge deal. This is basically the equivalent of going from a Ferrari V8 engine in your youth to a moped engine when you're seven years old.

What's important to understand here is if you only frame the problem as and fatigue as mitochondrial dysfunction and you try to fix it with B vitamins, correcting nutrient deficiencies, even giving hormones and things like that, or giving other drugs, metformin, whatever it is.

Or if you are trying to even eliminate the stressors on the mitochondria, eliminate, you know, if somebody's got mold toxicity, get rid of the mold or something like that.

All of that's great. It can ease the burden on mitochondria. It can help it shift more into energy mode. But you still have a moped engine in your cells.

You don't have a Ferrari V8 engine in your cells. And that's that's the part that most people are missing. Now, here's the key to understand here. And actually, let me add one layer first.

This fact also interplays with the first layer of the story that I told you, whether the mitochondria operate in energy mode or defense mode, because the weaker that mitochondrial system becomes, that that cellular engine becomes, the more easily it is overwhelmed by stressors and the more fragile it becomes, the more easily it it's

switched from energy mode to defense mode.

Okay. So because it can't handle the stress demand as well. So what we have to understand is, well, here's the good news, okay? People might be thinking, well, well, jeez, this really sucks that, you know, as a natural product of aging, we all lose 75% of our our mitochondria, of our cellular engine.

But the good news is, it is actually not a natural product of aging itself. And the reason we know that is because when we look at seven year olds who are lifelong exercisers, lifelong athletes, they don't lose 75% of their mitochondrial capacity.

They have the same mitochondrial capacity as young adults do. So what that tells us is this is not a function of the aging process. This is a function of modern lifestyles.

And specifically, it's mostly a function of lack of or medical stress on the system. Okay. So as an analogy, we all know that if we go to a gym and we challenge our muscles to lift heavy objects, they will adapt to that by growing bigger and stronger.

The problem is, if you've ever broken a bone, you know this. If you break a bone, you immobilize that joint that muscle in a cast and you don't use it.

Eight weeks later, when you go to the doctor, they soft your cast. You look down at your arm or your leg and it's half the size of the other one. And that's all that muscle tissue atrophied and atrophied from disuse, from lack of challenge, lack of stimulation in the same way that it grows with with challenge, it shrinks when it doesn't have challenge.

So as an analogy, think of think of like a imagine a magical sports car that when you drive it and you take it on mountain roads, curvy roads, and you push it to its limits, you rev that engine, drive that car as fast as it can go, push up, push it hard into turns.

And then when you go in and park that car in your garage at night, you come back to it the following day. And it actually grew a stronger, bigger engine that has more horsepower and became more fuel efficient.

And the tires learn to grip the road better and the suspension learn to absorb the bumps better in the frame got stronger and every and they got more aerodynamic and every part of that car became better and stronger and faster and more efficient and but the downside is that if you just leave the car in the garage and you don't challenge it, you don't push push it to its limits, you come back to it a couple of months later and it's disintegrating, it's rusting, the wheels are falling off, the frame is twisting, the engine is shrinking.

That's the story of the human body. And that's exactly what happens to our mitochondria in ourselves if we don't regularly challenge them. If you can imagine, your arm or your leg will shrink to half the size in two months.

Imagine what happens with 20 or 30 or 50 years of lack of challenge. And all of that information is so particularly relevant to women with PCOS because as I've said, unfortunately, it is what it is.

It's really like a condition of accelerated aging, which is why doing all the things you're saying and with the emphasis on exercise is so key. Now, I know you've created some programs because this information is incredibly important, but then it's like people out there like, how do I access this information to use it in a practical way?

I know I should be exercising. That is so clear. What else can people do and take now that they have a foundational understanding of this critical organelle the mitochondria?

What can they do? And what can you offer and suggest so that they can optimize their mitochondrial health and function and mitochondrial longevity? Yeah, great question.

I love the framing of that. So first of all, exercise is amazing. Exercise is the most potent disease prevention and

longevity drug in existence. And there is no drug.

You know, last 75 years, pharmaceutical companies have created millions, millions of chemicals that are designed to be drugs to treat different aspects of of disease and try to enhance longevity.

Of those, 19,000 of them have been FDA approved. There is no drug in existence of those 19,000 that we've created, the trillions of dollars, the world's smartest scientists and medical doctors, pharmaceutical scientists, they've created 19,000 of these drugs.

There isn't one that comes close to the disease prevention effects or longevity enhancing effects of exercise, nor is there any combination of them. You can take a chemical cocktail of six or ten or 20 different drugs if you want to.

Nothing will come close to exercise. Now, with that said, there's multiple subtypes of exercise as well, and it's important to do that right and have a routine that does it right.

Step one is basically just do something, be willing to do something. You know, if you're if you're not doing anything right now, then start by doing something that you can enjoy, whether it's dance or whether it's riding a bike or just walking or lifting weights, whatever it is.

But ultimately, you want to move towards optimizing the different subtypes of exercise as well.

How exercise, breath training, and metabolic stress rebuild mitochondria

Thermal stress, heat and cold is amazing. Fasting is another type of metabolic stress and nutrient cycling. We can challenge the system by, for example, taking away carbohydrates, restricting carbohydrates and putting the body into ketogenic states doesn't have to be as a permanent diet, but as temporarily inducing it creates a nice challenge to the mitochondria that helps improve their health.

Feeding and fasting windows is critically important. One of the best places that I like to start is with hypoxic training. With breath training, hypoxia is low oxygen states, so in my course, breathing for energy, I take people who have chronic fatigue and guide them through systematic training in breath, hold practices and other breathing practices.

But it really centers around systematic breath holding routines that take people all the way from 10 to 15. Second breath holds all the way up to 4 minutes and beyond an elite level breath holding.

And when you alter that system, you perform only improve mitochondrial health at every level of the body, not just the muscles, not just the cardiovascular system, but not just the lungs, but the brain.

Every organ in the whole body gets this dose of hypoxia and becomes more resilient and grows bigger and stronger in response to that. And it induces just wonderful adaptations, even at the level of improving improving the amount of blood cells that are in your bloodstream and oxygen carrying capacity, improving the ability to deliver oxygen to the cells.

And it actually alters the levels of gas is in the bloodstream when you know, when you're at rest, not just while you're doing the practice, but at baseline to deliver oxygen to the cells more efficiently.

So lots and lots of amazing adaptations that we get from that. But I find with people who have chronic fatigue already, especially who especially people who are exercise intolerant, where they have a really difficult time and they feel exhausted when they do exercise, this is just an amazing place to start because it doesn't expend all of the energy that you do when you do exercise.

You know you're sitting still as you do this, but putting stress on the mitochondria without the huge expenditure of energy. So the My Breathing for energy program really centers around that.

But ultimately where you want to get is you want to be implementing most of these different types of metabolic

stressors in your life. What's so fascinating about the holding the breath I know I always warn people who are out of shape.

If they're getting on a plane and going to a really high altitude, you know that that's something you really want to train for because, yes, it's a stressor on the body when you're suddenly at a high altitude.

So that's why when you do your breathing, you don't say, hold your breath for 4 minutes. You got to work up to it. Yeah. And how how hard is it for people to progress through these breath holding time increments?

Is this something that can happen over a month to years? Like how long does it usually take? And I don't know if you can even generalize. Yeah, let me let me answer your question this way.

One of the when it comes to this so everybody's heard the recommendation exercise, right? Everybody knows exercise is healthy. We've heard it thousands of times in our lives.

And so we can summarize this up by saying, you know, go, go do exercise. But but here's here's the part that's missing. One is what I said before. There's many different subtypes of exercise and to generate specific adaptations in specific parts of our body, we need to be doing the right things.

But as a general principle, across all of these different stressors that I just outlined, what's critically important to understand and what most people don't do is systematic progression.

And so if I if do an exercise routine and I lift, you know, if I lift this this book, for example, and I do three sets of ten curls, bicep curls, and then next week I come back and I do three sets of ten bicep curls with this book, and then six months from now, I'm still doing three sets of ten bicep curls.

At best. What I'm doing is maintaining what I have, but I'm not improving anything. So what people have to understand is that in order to actually improve, which means to stimulate adaptations in your body, your body has to have a signal that it needs to change, that it needs to adapt.

The body only cares about survival. It doesn't care about how your body looks or how big your muscles are or how much fat you have or anything like that.

It cares about survival. So in order to stimulate it, to adapt to something, to change, you have to give it a demand that it senses as a survival demand.

And what that means in simple terms is you have to push it a little bit beyond your comfort zone. And so that's true with exercise and it's certainly true with breath holding and it's true with sauna use and it's true with all of these different principles.

It's also true with mental straining. There's a mental side to this, too. Mental toughness is built. Even cognitive capacity is based on this principle.

To our mind, our brain grows stronger as a result of adaptation to challenge, right? So if you don't challenge it, if you don't push it a little bit beyond its current limits, its current capacity, there is no reason for it to change.

So when it comes to exercise or breath holding, what you have to do is you have to go just a little bit beyond your current capacity. Now you don't want to go way past it and you can't go faster that way.

So if I tell somebody who's been sedentary for the last six months, go run a marathon tomorrow, all I'm doing is creating harm. I'm not I'm not creating beneficial adaptations.

I'm just going to get that person with a bunch of stress fractures in their bones and lots of muscle damage and kidney damage. I'm doing them no favors.

This is not a shortcut to do that. You have to go. Whatever your current capacity is, you go just a little bit beyond it. Each time you train, you come back a couple of days later, four days later, or whatever it is, and you go a little bit beyond that and you do that systematically.

You have systematic progression built into it so that you are actually stimulating adaptations and changing your physiology. Now, many of the viewers out there may be thinking to themselves, Oh, my gosh, I'm £30 overweight.

I haven't been eating right. I've been sitting on the couch. I probably lost already so many mitochondria and they're in bad shape. So just so they know, because you're talking about really a wonderful program and advancement.

So if you're in that state and you already have lost a lot of the mitochondria like you talked about, they're physiologically like 70 year olds, even though they're much younger.

You know, there are these terms that are thrown around like middle Genesis or MITOPHAGY So maybe you could just say like what hope is there for people who are not in the greatest shape to create new mitochondria and rebuild the ones they have?

With all these things that you're talking about? Yeah. Thank you so much for asking that. Great question. So the good news is that this system is dynamic and we are that magical sports car that that I gave the example of earlier.

And even if you have gone from the amazing version of the sports car to the one that's starting to fall apart, the good news is that you can rebuild it back.

And and and I want to emphasize the power of this. Okay. This is not it's not like yeah, let me phrase it this way. And a lot of studies on a lot of different topics and a lot of pharmaceuticals and things like that.

They will talk about an effect size. But if you actually look at the details of what it is, it's a very minor effect. So like statin drugs, for example, reduce your risk of cardiovascular disease in terms of absolute risk reduction by about 1.3%.

And that's including a lot of the literature that's pharma funded studies. So it's probably actually considerably less than that. But let's say it's 1.3%.

That means that if you had a 20% chance of having a heart attack over the next five years, you now have an 18.7% chance. Okay. It's been shown, by the way, that most people in the general public overestimate the magnitude of effect by about 100 times, by about 10,000%, meaning they take the statin drug.

They think, well, I'm taking the drug means that I'm like eliminating my chances of having a heart attack. No, it means that you went from about a 20 out of 100 chance to a little less than in 19 out of 100 chance.

It's a very minor effect, and that's over five years of taking the drug every day for five years. So these are just to get a sense of effect size. Now, when we talk about some of the studies on where you you take groups of people who, for example, are sedentary 60 year olds or 65 year olds.

You can have them do an exercise program. And in eight weeks, in 12 weeks, you increase their mitochondrial capacity by 60, 70%. Massive improvements, growth of the mitochondria, mitochondrial biogenesis.

Okay. And you use the word mitophagy. There is also a cleanup process. The mitochondria themselves, not only grow bigger and stronger, they clean up damage.

They repair the damage in response to these signals as well. So this is not a small effect size. You can massively improve your mitochondrial engine and get back to youthful levels of mitochondria.

Now, if you're if you're 85 and you have an exercised in 30 years, are you going to get back to the level of an elite athlete who's 20 years old?

Practical hope, program resources, and closing remarks

Probably not. Okay. Because there's just so much accumulated damage over decades that it's you know, I'm not going to blow smoke up your butt and tell you something like that's possible.

But what I can tell you is you can have absolutely massive improvements in two or three months of working on this. And if you can do that in a study show that, then you can imagine what you can do in two years or five years of consistent, systematic progression.

And the beauty of everything that you're saying is that you're utilizing your own body's innate mechanism for regeneration, for improvement, for prolonging healthspan in all these ways without a single pharmaceutical.

Exactly, yes. And in my opinion, we need a shift. There is there's a massive shift that is needed. People have been indoctrinated with the idea that the way to health, the way to longevity and disease prevention is a matter of medicine, learning about disease and mechanisms of disease and developing chemicals, synthetic chemicals in a chemistry laboratory we call pharmaceuticals to treat these mechanisms of disease.

And that's if only we had the right synthetic chemicals to add to our body, then we could combat these mechanisms of heart disease and of cancer and diabetes, and then we can live a longer time.

And so we think the solution to longevity and feeling better is a matter of we've been indoctrinated with the idea that we need to behave like sick medical patients who need to add synthetic chemicals to our body in order to live longer.

But as I said before, the truth is that there is nothing more for that than exercise. And if we look at other things I mentioned, like sauna sauna has a sauna, use has amazing research showing reductions in risk of cardiovascular disease and cerebrovascular disease, massive, you know, 60% plus reductions, reductions in dementia and Alzheimer's of 60% plus reductions in all cause mortality of 50 60%.

If there were a drug that could do that, that would be the most incredible miracle drug ever created. If every person in the world would be told they need to take it, your doctor would look at you like you're crazy if you weren't taking it.

Now I'll give you another example. There's lots of talk of dementia and Alzheimer's. There was a study, I think, in Sweden where they followed 1400 women over 40 years and looked at the incidence of dementia and Alzheimer's, mild cognitive impairment according to fitness level.

And what they found is that at the lowest fitness levels, almost half of those that that group of women, about 45%, got mild cognitive impairment during the 40 years in the group of the highest levels of fitness, it was almost zero.

Was almost zero. So they showed even comparing it to a medium fitness, not low fitness, but comparing to medium fitness as the baseline. A group with the highest levels of fitness had an 88% reduction in their risk of mild cognitive impairment.

So just this one factor of exercise, not even taking into account nutrition or sleep or stress or anything, anything else, just just exercise and not even probably doing exercise even remotely, correctly or optimally, but just having an exercise routine of some kind almost eliminates your risk of getting this major chronic disease, that's that's a major killer.

Right. And there's no drug that can come close to that. So what what I argue is there's a shift. People need to stop externalizing their power and seeing health and longevity as a matter of behaving like a sick medical patient who needs to go get tested for all of the different types of your dysfunction, find your dysfunction, do treatment protocols for your dysfunction.

And instead, I believe we need to start thinking of ourselves more like athletes who need to train to achieve the

goals we desire. The goal in this case is not that we're trying to improve performance in a particular sport, but we are training for disease prevention and longevity.

So that's that's what I think is would be a very beneficial shift for the world to have right now. Absolutely. We always talk in my practice about fitness is a vital sign.

Exercise is medicine, which was all coined by the American College of Sports Medicine because it is and I know fitness status has more predictive value than hypertension as far as morbidity, mortality and everything that you said.

So and everything that you've talked about with mitochondria is so relevant to all of the viewers with PCOS, because inherently women with PCOS have some miracle tendril dysfunction and energy deficiency.

So everyone out there wants to know, well, how can they follow you? How can they even learn more about what you might be able to offer them and give them hope, you know, real solid hope for what they can do to rebuild their lives, their energy, their their entire health status.

Yeah, thank you for asking. So I would definitely go to my site, theenergyblueprint.com. I have programs there. My flagship Energy Blueprint program and the one I mentioned earlier, which I highly recommend to anybody as a as a great place to start.

If you're suffering from low energy levels or you even have normal energy levels and you want to you want to improve them, and especially also people who suffer from anxiety.

Go check out the Breathing for Energy program. It's just amazing. You wouldn't believe the testimonials that I get from this program. I mean, even a week, two weeks into doing these practices, it's people find it life transformative.

So that's where I would go, theenergyblueprint.com. Well, I'm sure everyone wants to relisten to this interview because there was so much information, I'm sure a new to so many out there.

And what you're offering with your program, it sounds amazing. I'm not surprised about the testimonials and I can't thank you enough for joining me and sharing what has been years of acquired knowledge, wisdom and then your incredible application of this information to really transform lives.

It's I thank you so much. Thank you so much for having me. Dr. Gersh it was an absolute pleasure.