# SuperCharged Podcast

## What's Causing Your Fatigue With Ari Whitten



Harry Massey: Welcome to the Supercharged Podcast, where we help you to enhance your energy, health, and purpose.

Wendy Myers: Bioenergetics is truly the future of medicine.

Harry: Imagine having a body charged with energy and a mind quick as lightning. Is that a superhero? No, that's you, supercharged. We'll be talking to experts who have studied the physics of life so that you can have energy for life.

Wendy: Please keep in mind that this podcast is not intended to diagnose or treat any disease or health condition, and is not a substitute for professional medical advice. Please seek a medical practitioner before engaging with anything that we suggest today on the show.

Harry:

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Hi and welcome to the Supercharged podcast. I'm Harry Massey. Today we're going to be actually talking to Ari Whitten, but we're going to be talking to him from a special perspective, but basically the subject for Ari is what's causing your fatigue and how can you use that to supercharge your energy. Now he's the founder of theenergyblueprint.com, he's an expert in using cutting-edge evidence-based science to building maximum energy, overcoming fatigue, as well as achieving permanent weight loss. Now understanding how biology really works includes looking at the cause of fatigue issues and giving ourselves the nourishment they need, and then charging ourselves with source energy. Now the way that we can charge up ourselves is to make some lifestyle changes from optimizing our environment and also a big part of fighting fatigue is being conscious of how ourselves interact and exchange energy with the world around

us. Two ways you can significantly top up your sources of energy include giving your body a healthy dose and the right kind of light and movement, and there's a couple of areas that Ari specializes in and there are also topics that we feature in the Supercharged documentary movie and also within our educational membership portal. In this podcast you're going to learn how to get to grips with what's causing your fatigue and what will enhance your energy, and you'll also find out some simple healthy lifestyle tips and strategies that are based on solid science that you can incorporate into your daily routine straight away. Ari really, really is an expert in the science of stepping up your game. To kick off I began by asking Ari to define what energy is from his perspective, and why he decided to make it his mission to alleviate fatigue and help people get their energy back.

Ari Whitten:

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Well, energy is an interesting area right now because we have an epidemic of fatigue that's going on, just millions of people are suffering from fatigue. It's now become the most common complaint of people going to their doctor, is that they're suffering from chronic low level or severe fatigue, and most doctors simply don't have a good answer for it. What I wanted to do was create a comprehensive science-based blueprint for what are the causes of fatigue and how can we fix it. It's not about fixing it through prescription drugs or surgery, which are the main tools of most conventional MDs. It's about fixing it through lifestyle and nutrition interventions. Energy is kind of a nebulous word and so many people use it differently than other people. It can be used for everything from spiritual pursuits and spiritual energy in a very kind of new agey woo-woo sense, to bioenergetics, to energy in a pure calorie sense. For me, what it means is having that vitality, that pizzazz, that feeling of aliveness in your body that you live with passion and aliveness because your body is filled with energy. For me that's, when I talk about energy that's what I'm really focused on, is that physical feeling of vitality and aliveness.

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Harry:

Ari, what is the connection between energy and actually being healthy and getting that feeling of vitality and aliveness?

Ari:

When your cells are struggling to produce energy, they don't operate well. Basically everything that a cell does, whether it's a cell in your brain or your liver or your heart or any other organ in your body, in order for it to perform whatever functions it does it requires energy. Energy is produced in the mitochondria of the cells and when the cell does not have enough energy, it doesn't do those functions very well, and it translates into poor function of that overall organ system of the body. If we're talking about the heart, poor heart function. If we're talking about the liver, poor liver function. If we're talking about the brain, poor brain function. Now if everything, all of the cells in your body are not producing enough energy, it translates into poor function of everything, everything's at a deficit for energy, and as a result your overall feeling that you have as a human being of what it feels like to not have enough energy in the cells of all your different organ systems is that you will feel the

symptom of fatigue, you'll feel a lack of aliveness, you'll feel almost more dead, like you're not there to experience everything that there is to experience in the world. Fatigue for me is kind of like a life killer. It prevents you from engaging in your life in the way that you could if you actually had enough energy.

Harry: I know too well what Ari is talking about when he says fatigue is a lifetime killer. Now chronic fatigue stole my energy and almost seven years of my life and where I ended bedridden. I tried a lot of different therapies before I realized what works and I found that cracking the code of energy really is about a whole wide range of interventions and a big part of fighting fatigue is being conscious how ourselves interact and exchange energy with the world around us. To charge up our cells we need to make conscious lifestyle changes that optimize our environment, and pacifically this means you need to take action steps that will take care of and charge the mitochondria which is a mighty little generator of energy inside our cells. As Ari has discovered, new scientific research shows why maintaining the mitochondria is even more important than previously thought.

Ari: The big connecting piece here is the mitochondria. Most people know of the mitochondria as our cellular energy generators, our power plants, our batteries.

00:06:40 People refer to them in various ways, to get at this energetic component of the mitochondria, this is the place of the cell that's actually producing the energy that the cell needs to do whatever the cell does. And that energy is in the form of something called ATP, adenosine triphosphate. Now everybody knows about that function of mitochondria. That's kind of what everybody equates mitochondria as. We all know it as that, just the energy generator of the cell. Now here's the big breakthrough that's happened just in the last few years, and it's come out of a researcher here in San Diego at the UCSD at a lab for mitochondrial medicine, University of California San Diego by a researcher named Robert Naviaux. Basically what he's discovered is that the mitochondria actually have another role, beyond just producing energy for the cell, something that is equally important and has been this kind of hidden secret factor of mitochondria that even people who know lots about the mitochondria really are unaware of. The second role of the mitochondria is cellular defense, which sounds kind of weird like why would it matter that the mitochondria are involved in cellular defense. Well, it turns out that the mitochondria are kind of at the hub of the wheel of our metabolism. They're controlling what happens in the cell in response to the kind of signals they're getting from the environment. This researcher at UCSD has discovered something that he's termed the cell danger response. Basically what this is, is the mitochondria are sensing what kind of signals they're getting from the environment, and depending on whether they're getting safety signals or whether they're getting "danger signals" of various kind of threats, whether biological threats, chemical threats, physical threats, any type of perceived danger or threat or stressor, they now shift their metabolic machinery and the cell's metabolic machinery towards something he's called defense mode which is basically mitochondria are shifting the cell to

turn off energy production and shift into a mode of engaging that is designed to protect the cell and the host, us, from harm. A lot of this really hinges upon the mitochondria, and this is really a whole new field and a whole new understanding, a new paradigm of health and what creates energy and what creates fatigue, and it really hinges on the kind of signals from the environment that the mitochondria are sensing.

Harry: Now one of the signals we can be sending to ourselves a lot of the time is stress hormones. And if we're under a lot of stress, our bodies end up favoring the fight or flight response and then all of our energy gets used up into that response, to fight for our survival, rather than expending energy or other bodily functions such as digestion. Ari, is there a similar mechanism at play here?

Ari: Yeah, it's related to it. And part of what goes on at the cellular level is this, the changes in cellular function in response to certain kinds of threats and danger. What you're talking about is the autonomic nervous system, so the parasympathetic and sympathetic nervous system, and it's kind of like a bigger picture layer of what's going on when something's in chronic stress mode. There's things that are occurring on the cellular level, at the mitochondrial level, the cellular level, the organ system level, the nervous system level, and so on. One of the things we know about people with chronic fatigue for example is they have a sympathetic nervous system dominance and an underactivity or relative underactivity of the parasympathetic nervous system. I'd say it's kind of just looking at the same basic phenomenon, just on a different layer of physiology.

Harry: You may already know that food turns into ATP and also that it turns into electrons for energy. But the interesting point that was covered in the Supercharged film is that food, sugars, and fats aren't the only source of energy

00:11:00 fueling the mitochondria. Ari gives one of the best explanations I've heard about why this is the case and how there are other sources such as light that serve as a powerful energy source too.

Ari: We all kind of know that food and especially carbs and fats get turned into something called ATP, adenosine triphosphate by our cells and specifically our mitochondria. They take in byproducts of fatty acids and carbohydrates and translate that into ATP, energy for the cell. That's the main mechanism that everyone talks about as far as energy production. Now it's turning out that there's some emerging lines of evidence that are showing that our cells' ability to produce energy is affected by a number of different things, not just how much carbs and how much fat we pour into the system. We all know this intuitively. You don't get energy in proportion to how much fat and how much carbs you consume. In fact, you can actually get the opposite. If you consume lots and lots of carbs and lots of fat, you may actually feel fatigue. We get a food coma. We get this reaction of actually wanting to go to sleep. There isn't a direct corelation like one might logically kind of conclude, if carbs and fats are what

are creating energy, then you might kind of just simplistically and logically conclude that adding more carbs and fats to the system should give you more energy. In fact, it doesn't work like that. There's all these other layers of complexity to the story. One of those is light. If we think about the concept of light exposure and electromagnetic radiation, in terms of our ancestors, we can look at certain factors. The biggest one is that our ancestors lived outdoor lives. They weren't stuck inside of insulated buildings with artificial lighting, fluorescent and LED lighting all the time, and they didn't stare at electronic screens every night, and their major light sources weren't the fluorescent light bulbs overhead and the TV screens and the computer screens next to them. They were outdoors in the light of nature, under the sun for hours and hours and hours every day. And the intensity of the sun is hundreds of times greater in terms of light intensity compared indoor lighting. That's one factor. They're in that light, and not just all these different wavelengths of light, so the blue light affecting our circadian rhythm, the red and near-infrared light, the far-infrared light, the UV light, all of these different types of wavelengths that are affecting different systems of the body. Then in the evening, after the sun went down, they built fires and then they sat around a fire light, which was emitting lots of far-infrared in the form of heat which has certain physiological effects, as well as red and near-infrared. They're bathing in these photons of electromagnetic radiation that are having all of these physiological effects. The overall amount of these things was hundreds of times greater than what modern humans are getting. We're missing out on those hours in the sun every day, we're missing out on the hours next to a fire every day, bathing in the red and the near-infrared and the far-infrared. We're missing out on the effects of light on our physiology and we're paying a huge price for it. It turns out that light is actually composed of a number of different wavelengths. There are five different wavelengths of light that are bioactive in us that affect human physiology in various ways, and there are many different mechanisms and many layers to the story, but just to give you kind of a brief overview, some of these wavelengths of light are UV, and there are different types of UV, UVA, UVB and so on. We also have visible light so things like blue and red light which have various effects on various physiological systems of the body. For example, blue light goes through our eyes and feeds back into a part of the brain called the suprachiasmatic nucleus which controls the circadian clock, the 24 hour rhythm, biological clock in our brain that tells us when to be awake and alert and active and energetic and when to go to sleep. That's why we get tired and sleepy at night and why we wake up in the morning. It has a huge impact on our energy levels. We also have things like red light and near-infrared light, and these have other effects which we can get into a moment on cellular function. Then there's things like far-infrared light as well which we feel as heat like if we go into a for-infrared sauna or you go in the sun and you feel the rays of the sun heating up your body. Well that far-infrared energy has a number of other physiological mechanisms on our cells. It impacts circulation in our body. It can trigger certain reactions in our cells. It can affect the water viscosity inside of our cells. All of these things have subtle mechanisms that translate into how healthy we are,

how energetic we are, and in terms of red and near-infrared light it's actually been shown, and there are numerous studies on this, that photons from red and near-infrared light can actually travel directly into our cells, can actually penetrate through our skin and go deeper inside of our body, and interact directly in the mitochondria, the energy generators of our cells, through a specific spot in the mitochondria called cytochrome c oxidase which it acts as a photoreceptor and takes those photons, and by doing this it can actually trigger the production of energy by the mitochondria. It's not just a matter of, again not just a matter of how much carbs and fats you pour into the system. But there's lots and lots of layers of things which are impacting our energy production. Just one other aspect of this, of how infrared energies and near-infrared and red energies can impact our cells, there's also research showing that it can impact the viscosity of water inside of our cells, and this has actually been shown to affect the rotation of the ATP synthase pump on the mitochondria, which is the last step of the mitochondria that they need to produce ATP cellular energy. So by altering the viscosity of the water in the cell, you can actually make it easier for your mitochondria to actually produce more energy.

Harry:

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So when we're looking at how to maximize the energy produced by mitochondria, I wanted to know how does that relate to movement because movement is another way of giving ourselves a big surge of energy. What kind of damage can be done to our cells from a lack of movement? And on the other end of the spectrum, why can overdoing exercise also be detrimental to us too? How do we strike the right balance? Ari expertly explains.

Ari:

Movement is an integral piece of our energy levels. There are kind of two sides to this equation because as any elite athlete will tell you, if you do too much physical activity you can actually burn yourself out and create fatigue. It's a phenomenon we call over training. Most elite athletes will have experienced that. We know this is pretty well established in the scientific literature that when you over train and when you do too much, too frequent, too intense physical activity, you can actually kind of wipe yourself out and exhaust yourself and even with lots of sleep you'll still feel pretty exhausted. There's even research to show directly how over training lowers mitochondrial energy production. And even research that has shown that it can cut it by close to half as a temporary state, that you can dramatically reduce the amount of energy being produced by the mitochondria in your cells. Now that's not the problem that most of us have. It's not over training. It's actually under training and under movement in particular. Now this creates a different set of problems for the mitochondria. Basically the way that this works is in order for our mitochondria to operate well, there are certain steps in the chain of how the mitochondria actually produce ATP cellular energy. At each step in this process they send a hydrogen ion, a proton, across one membrane of the mitochondria into what's called the intermembrane space. As this process happens, these hydrogen ions build up in the intermembrane space. Now, in order for this process to happen on an ongoing basis, there has to be some kind of burning up of energy. Now,

what happens when you're sitting for very long periods of time and you're sedentary, you're not moving your body, is that you're not burning up enough of the ATP that's being produced and so there's kind of a block in the machinery that takes place. It starts to kind of get clogged up as you don't allow these things to burn off and keep things flowing through the machine. What happens when that's going on is sparks start to get flung off from this machinery in the mitochondria, so electrons are being passed in the mitochondria as part of this electron transport chain to produce energy. Now, when somebody's sedentary too much it translates into some of these electrons kind of ... Because the machine's getting clogged, some of these electrons kind of get just flung off and released and in the process they actually damage the membranes of the mitochondria and can become free radicals and things like that. Basically, being sedentary translates into direct damage of your mitochondria which is directly damaging and hindering your body's ability to produce energy.

Harry: Now a big takeaway there, think about the damage done to your body by not moving, such as creating free radicals in your system. Why are free radicals a problem? Well, because they are toxic byproducts of oxygen metabolism and can damage your cells in a process called oxidative stress. That, in turn, hinders the body's ability to detoxify and such an imbalance leads to damaging proteins, molecules and genes within your body. Free radicals can kick off a whole chain reaction like dominoes, so the key here is to get moving in whatever way you can. I asked Ari to explain in more detail why movement is so very important and why he considers movement as a nutrient for your body.

Ari: Our health and our energy levels can't be generated in a vacuum. You can't get healthy by just laying in bed and doing nothing all the time. There has to be some kind of movement, some kind of life, some kind of stimulus. Humans are meant to go experience the world. We're meant to move our bodies and movement is basically a nutrient. When we don't move our bodies we miss out on that. What I mean by it's a nutrient is there are so many different layers of physiological systems that are affected when we move our bodies. We affect our brain, we affect our nervous system, we affect our cardiovascular system and our lungs and the delivery of oxygen and nutrients to the different tissues and so on, and we flush out waste products that are located in different parts of the body and different parts of the cell. We get our lymph system moving to flush lymph fluid back through our body so that our immune system can process that. All of these different layers of activation are happening as we move our bodies. Movement is very much a nutrient in the same way that oxygen and food and water are nutrients. It's a required nutrient for life and when we don't move our bodies we suffer the same sort of consequences that we suffer when we don't put good nourishment into your body, you don't put pure water into your body and you don't breathe clean air.

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Harry: But what if you suffer from severe fatigue issues and are debilitated? Having personally been bedridden with chronic fatigue syndrome, I was pretty

frightened about exercise. When I was at my worst it could take me three steps backwards, so I went on to ask Ari: What do you tell those people who struggle to even take the first few steps and are afraid of relapse? What advice do you have for people with this mysterious and often misunderstood condition?

Ari: Great question. The answer is that both need to introduce more movement into their life, but there needs to be a difference in terms of the dose and the frequency and the intensity and the cautiousness by which one implements that physical activity. To make it more simple and practical, basically if we're talking about just a sedentary person who is not chronically fatigued, you can tell them to go start an exercise regimen and not really worry too much about anything happening. They might be a little tired or sore afterwards, but they're not going to be debilitated from it. Now on the other hand, somebody with chronic fatigue has to be very, very careful and cautious with how they implement physical activity. The basic rule of thumb is that you should be very cautious in overdoing anything beyond either your norm or what you know your body is capable of handling, both in terms of intensity, in terms of duration, in terms of frequency of movement, all of those factors. In other words, they need to be very careful in doing only something for a very short duration at a very low intensity, just very gentle movement, and then once they've done that it might be ... For somebody really debilitated it might be just getting up and walking 10 feet or 20 feet and that might be where they need to start, or just getting up and down from the couch a few times, from a seated position to a standing position. That might be enough for somebody who is debilitated. Once they've done that they need to assess their body's reaction, how are they later that day, how are they the next day. Once you've got a baseline for what your body can tolerate, now you can start to gradually progress very slightly beyond what you were capable of a few days prior to that and you push just very, very slightly beyond and then you give your body adequate time to recover and rejuvenate and regenerate itself after that brief stressor. That's the basic principle that one needs to engage in is this very measured and precise engagement of this at first gentle physical activity, gauge your response to it and then give your body lots of time to regenerate and then do another gentle nudge to push very slightly beyond that. In the process of doing that, you're slowly building up your body's capacity to do more physical activity. But this is not a matter of just jumping in to high-intensity interval training and doing lots of intense exercise, it's a matter of starting with very simple, very light, gentle movement and slowly building up your body's capacity to tolerate more and more movement. Within the chronic fatigue community there's a big fear around physical activity and exercise and for good reason. It's because this stuff actually can be very counterproductive. If you overdo it with physical activity you can exhaust yourself. You can wipe yourself out. You can be fried for days and bedridden for days as a result of just a very brief overdoing it of physical activity.  that it is a big problem to overdo physical activity. On the other side of the equation, it's also a big problem to always be sedentary and to not engage in any physical activity. Where we want to be is in this middle ground of very brief, very gentle little bits of physical

activity to get your body moving and get your mitochondria stimulated and working properly and to start building up your body's capacity to produce energy and tolerate more of that movement without burning out the system, without wiping out the mitochondria, without depleting the ATP supplies in the cells. That point at which you can accomplish that is different for every individual. Somebody who is healthy right now and just has a very mild fatigue can get away with a lot of physical activity and recover from it and not be bedridden for days. Somebody who is totally debilitated with the worst chronic fatigue syndrome imaginable might barely be able to take a few steps without feeling wiped out from it. Finding that point where you as an individual are as far as how much physical activity you can tolerate, what is your baseline? That's what you want to find out, and then from that baseline you want to err on the side of caution, so do much less than your body can tolerate. That's where you start and then from there after you do that give your body a big break, give it all the things it needs to regenerate and rest properly and then a day or two or three later try just a tiny bit more and then do the same thing over again: Rest, regeneration and then a few days later a tiny bit more. That's how you dig yourself out of that hole is you keep moving in that direction where you're very systematically, very incrementally and very cautiously getting your body moving again in a way that you're not overdoing it and you're not just afraid to do any movement because you're afraid that you're going to do something that makes you bedridden and exhausted for days.

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The biggest misconception I would say as far as what people think is causing fatigue and what's out there in the realm, the whole world of fatigue, is the concept of adrenal fatigue and this narrative that chronic stressors of various types basically cause fatigue because they stress our adrenal glands which produce a hormone called cortisol that's involved in the response to stress and blood sugar regulation and so on. By virtue of creating this demand on the adrenal glands, when you have chronic stress it kind of wears them out over time and then it alters your cortisol levels. First it creates high cortisol levels and then low and in the process of doing this, then you wear out the adrenal glands and then you get fatigue. Basically this narrative that our energy levels are directly proportional to our cortisol and adrenal function. This narrative is extremely common in the world of more holistic and naturalistic and functional medical professionals and health professionals this is the dominant narrative, that our adrenals get worn out from stress, that's what causes fatigue, so in order to fix the fatigue we have to fix the adrenal function. As common as this narrative is, and even though there are thousands of articles online and hundreds of books written on it and millions of people who apparently believe in it, there is virtually no science to actually support this whole paradigm. When I say virtually no science I literally mean there is almost no scientific evidence in existence that supports this theory. There is a lot of scientific evidence that contradicts the theory and says that this is not accurate and that this is not the cause of fatigue. A few years ago I had this idea that I wanted to create an evidence-based guide to adrenal fatigue. Like pretty much everyone else out

there, I was also operating in this narrative of adrenal fatigue, this was what I was convinced of and why wouldn't I be when everybody is talking about it? Like I said, there were thousands of articles written on it and books being written on it so why would you try to even question something which apparently the whole world believed? But I started to notice that in a lot of these books and a lot of these articles, pretty much all of them, they were kind of short on scientific references. They would create very elaborate-looking charts and explanations for fatigue and the different phases of adrenal fatigue and so on, but there usually weren't any actual scientific studies that they were linking to that backed up their claims. At the time, kind of naively enough, I just thought, well the science is obviously out there but these people just didn't go to the trouble of actually linking to it. I wanted to create a book that was all about the evidence on adrenal fatigue and I wanted to basically call it The Evidence-Based Guide to Adrenal Fatigue. What does the science say about the causes of adrenal fatigue and how to fix it. I thought that I was going to go into the research, dig into all these studies for three months or six months and kind of compile everything and then put all the pieces together. When I went to go start looking up the research, what I discovered was that there basically wasn't any actual scientific research that has been done on adrenal fatigue.

There's almost nothing there. I didn't really know where to turn at that point. There's nothing to look at. There wasn't any research that I could compile to even start the process of making sense of it all and kind of putting it all together. What I did discover is that there are a few related conditions that are very similar to what people who are talking about adrenal fatigue are talking about. Even though adrenal fatigue is not a legitimate, recognized medical condition by MDs, by conventional medicine and they all kind of scoff at it as nonsense, there are actually a few conditions which are legitimate, recognized conditions. Things like exhaustion disorder, burnout syndrome or clinical burnout. There's also research around something called HPA axis dysfunction, which is not a condition per se but it's a state of physiology that there's quite a bit of research on. And then we have chronic fatigue syndrome, which is another legitimate, recognized, accepted condition. What I discovered is that there are several dozen studies that have analyzed the cortisol levels and what's called the HPA axis function, which is the hypothalamic, pituitary, adrenal function, which is basically the whole system that regulates cortisol levels and this kind of stress response system, so basically still kind of adrenal function, cortisol function, just also including more than the adrenals but certain brain areas. There were these studies that were analyzing the cortisol levels in conditions like burnout syndrome, exhaustion disorder, chronic stress, chronic fatigue syndrome and so on. What I wanted to do was basically compile all that evidence and I mean all of it, literally every study that has ever been done on the subject of analyzing cortisol levels in relation to any of these different conditions, anything that could be remotely related to the concept of adrenal fatigue. I found over 150 studies overall and to sum up what these studies said, basically about 25 percent of them said that in people with chronic stress or burnout or

exhaustion, fatigue versus normal healthy controls, normal regular healthy people without fatigue, about 25 percent of those studies said people with chronic stress and fatigue had high cortisol levels. Another 25 or 23 percent said that they have low cortisol levels relative to normal healthy people. Over 50 percent could detect no difference whatsoever in either cortisol levels or HPA axis function in people with burnout and chronic stress and exhaustion and fatigue and chronic fatigue syndrome versus normal, healthy, regular people. They could not detect any difference whatsoever. Overall, the overall body of evidence, is pretty clear that there is not a strong relationship between cortisol levels and fatigue and burnout. In 2016 there was another systematic literature review, which is the highest level of scientific evidence, which basically did exactly what I just told you that I did, it reviewed all of the different studies on everything that's remotely related to this concept. This systematic review that just came out in 2016 basically concluded: Adrenal fatigue does not exist. There is no science to back this concept up. You can go look at the literature yourself, there are literally dozens of studies which have tried to find a link between cortisol levels and chronic fatigue and they haven't been able to find them. They haven't been able to detect any dysfunction whatsoever. There are even studies that have looked at cortisol levels as people get treated for burnout or chronic stress and analyze their before cortisol levels and after cortisol levels and they have not been able to show a normalization of cortisol levels that corresponds to an improvement in systems. There are just so many studies that have attempted to find this link and they cannot find the link.

Harry:

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Okay. For those without a chronic illness, perhaps you're someone who is relatively healthy but are just feeling fatigued all the time, but you'd like more get up and go, to have more energy. What is the latest advice on which is the best form of exercise for you? To have more energy, is it about doing a lot of long walks and things like that or is it about the more weight-based or short intensive- type training? Which is the best path for putting our best foot forward?

Ari:

In terms of the actual science around movement and energy levels, overall the evidence supports gentler forms of movement for actually translating into how you feel in terms of your energy levels later that day. Gentler forms of movement like walking or yoga, qigong, things like that. Any type of gentle, long duration, endurance exercise. Any of that type of exercise tends to translate into better energy levels in the immediate aftermath of doing that physical activity. Whereas really intense forms of high intensity interval training, and sprinting, and intense weight lifting types of exercises, can often translate into you feeling less energetic in the immediate aftermath of that physical activity. So, there's a couple contexts here, one is how energetic a person feels in the hours or day after that burst of physical activity, and the other context is the long term improvements in cellular health and cellular energy producing capacity and fitness, that occur through various types of physical activity. And all types of physical activity can translate into physical fitness benefits, that

ultimately confer better energy levels, but in the immediate, definitely gentler. Things like walking and endurance exercise, translate into better improvements and energy levels. Now there's also an element here of, if you want the energy, you have to do the thing. And it's a little bit reversed in how we might normally think about these things because we often thing, "Well to go do this physical activity. And so I'd rather just sit here, lay here because I don't have the energy to go do that." And interestingly enough, the way that it works, is often the opposite. If you go do the thing, even though you may not have the energy at that moment, it will actually give you the energy. Not only in the immediate experience and aftermath of doing the thing, but also, you're building the capacity of your cells to handle that. And do it becomes easier and easier to continue doing the thing. On the other hand, if you always make the decision not to do it, because you don't have the energy, you're creating an atrophy and a degradation of the mitochondria in your cells, and a loss of their capacity to produce energy and power physical movement. So the more that you make the decision to not engage in that physical movement, the more your body loses the capacity to engage in it. And the more often you'll find yourself in that position of, I don't have the energy to go for walk, or go for a run, or do this workout. And we lose that capacity very quick. Just in the matter of a few weeks, we can lose a lot of that capacity of our cells to actually handle that kind of physical activity. So it's very, very important that we continue to engage in those activities. Even if they're not intense, even if they're not strenuous and you're not driving yourself into the ground, and wearing yourself out. But just

00:43:15 maintaining a little bit of gentle movement all the time, is extremely important so that our cells continue to have that capacity to engage in that.

Harry: So what's the best way to get motivated to exercise, and follow through on our goals?

Ari: I think it starts with the initial experience of what I was just describing; which is that experience of "Oh, I don't have to sit and lay down and wait for the energy to arrive, before I go and engage in this physical activity or just go for a walk." By going for a walk, by getting outdoors, by getting natural sunlight, by doing the physical movement, and by making the mental decision to go, even when you didn't feel like going. All of those things create a sort of empowerment that actually lead to more energy. And so, when you have that experience of going, "Wow, I didn't have the energy, but not I have the energy, now that I've gone for this walk." You have to do exercise, it just has to be done in a a very incremental and systematic way, and a very cautious way. So that you don't do

00:44:30 more harm than good.

Harry: So if you still need a bit of an extra nudge, or a big kick start, well than a little more science might give you the motivation you need. There is a biological process that absolutely fascinates me, and it's called hormesis. Now I talked to Harry about why some stress on the body can actually be a good thing, and help us generate more generate more energy, and become healthier. It relates to the

famous quote by Friedrich Nietzsche., "What doesn't kill you, makes you stronger." So what exactly is hormesis? How does it work, and when can it be a good thing to push ourselves?

Ari: Hormesis is basically a transient metabiotic stressor that stimulates your body to grow stronger and become more resilient, and become healthier, and more energetic. Now if that sounds like an abstract idea, we're all actually more familiar with this concept than we realize. And we've all heard Nietzsche. say, "what doesn't kill you makes you stronger." So we all know that. You go through challenges in life, whether life challenges, or whether just brief experiences that made you uncomfortable in some way; psychologically uncomfortable, or physically uncomfortable, and you become tougher as a result, you become more resilient. And that's what hormesis is. Now we also know of exercise, and everybody knows about the benefits of physical exercise and if you look at the science, you know it translates into decreased risk of cardiovascular disease, and Alzheimer's, and dementia, and diabetes and so on. I mean almost you name the disease, and you can find research showing that exercise helps prevent or treat that disease in some way. Now, the reason that exercise works, and this is very important, it's not because exercise is intrinsically healthful, and somehow the more you do of it, the healthier you become. Exercise is actually a metabolic stressor. It is a stressful thing for body, and by putting the body in that situation where you're creating this metabolic stress on it, as long as it's done in the appropriate dose, and then you give your body the chance to rest, and recover, and regenerate afterwards, you will stimulate your body to make certain adaptations that actually make it grow stronger and more resilient. And that is fundamentally why exercise confers benefits, and why we have all these thousands of studies showing that it benefits this disease and that disease and overall longevity, it makes you live longer, it makes you more energetic and so on. It's because it's a stressor, and that's what most people need to understand is that you're not doing something that's just good for you quote unquote. And this is a fundamentally different thing than let's say drinking water, or eating nutritious food, or getting sleep or meditation or something like that. These are more like restful, and regenerative, and nutritive types of activities. Exercise and other type of hormesis, are stressors. And the way they confer benefit, is by stressing the system so that it stimulates the body to create adaptations that ultimately confer benefits. So it's a different paradigm and a different way of understanding things. You can get healthier by subjecting yourself to something that is quote unquote a bad thing, as long as that bad thing is in the appropriate dose, you will actually stimulate your body to grow stronger. And those adaptations that it makes depend on the type of hormesis that you expose it to. So for example, even depending on the type of exercise. So certain types of exercise may work to create more muscle growth for example, other types of exercise may work to create more capillarization , or blood vessel growth to deliver more oxygen and nutrients to the cells. They may also stimulate the growth of your mitochondria, your cellular energy generator, so they grow bigger and stronger, and you actually get more of them so your cells can

produce more energy. Other types of hermetic stressors create other types of adaptations which confer various types of benefits. There are various types of metabolic stressors, of hormesis. We've talked about exercise, obviously that's one type that most people are familiar with. And there are actually several other types beyond exercise. There are close to a dozen different types of hormesis. A couple of them are temperature hormesis. So cold exposure and heat exposure. So things like going into cold water, or cold air, or into a sauna, or being outdoors on a really hot day and sweating. These are other types of hormesis, that actually trigger a lot of the same molecular pathways as exercise. Some other types, hypoxia which happens when you do things like breathe holding, also during certain types of exercise, also when you go to altitude. Is you stimulate low oxygen levels in your body, and by doing that, it's another mechanism that triggers all sorts of adaptations in your cells that build up your internal anti-inflammatory system, they build up your mitochondria to produce more energy and so on. We also have things like intermittent fasting. Which is another type of hermetic stressor, and we don't think of it. Most people know of intermittent fasting, but they don't realize it's actually working through this concept of being a temporary metabolic stressor for hormesis. Things like carb restriction.

Depletion of the carbohydrates in your body can be a form of hormesis, can be a form of intermittent stress on your body. We also have things like phytonutrients which are chemicals that are produced by plants that actually trigger a lot of these same molecular pathways that exercise and heat and cold and a lot of these other forms of hormesis do. They trigger the mitochondria to produce energy more efficiently. And they make our bodies more resilient overall. We've hear of the concept of adaptogens. Well, adaptogenic substances, when they have these phytochemicals in them that are adaptogens, they're making our bodies more resilient to stressors. And they're working on this principles of hormesis. And what I mean by that, is that they're actually creating a temporary metabolic stress. Now, this is an important concept to grasp, because most people think of phytochemicals as “just antioxidants.” They're just beneficial substances. And the reality is that these are chemicals that are usually produced by plants to be toxins. They're meant to ward of things from eating it. And it turns out that because humans have co-evolved with a lot of these different plant species, we've learned a few tricks. We've learned not just how to neutralize the toxins, but actually how to benefit from them. And this is the concept of hormesis. We can consume small amounts of these plant toxins, and it will actually serve as this type of hormesis. As a temporary metabolic stressor that stimulates our mitochondria to grow stronger, increases our internal anti oxidant defense system, and our anti-inflammatory defense system. Strengthens the immune system, makes our mitochondria bigger and stronger so they're able to produce more energy and so on. So that gives you a kind of an overview of the different types of hormesis, and the ways in which it can be used to boost overall health and vitality. Now I think that it's not going to far to say that hormesis is the crux of overall health

and vitality. That the degree to which you've systematically layered different types of hormesis in your life, will pretty much directly determine your overall health, energy and resiliency in life.

Harry: So Ari talks about carb restriction in his best selling online course, and mentions if people are suffering from being overweight, their better off ironically, on fatty diets. And I they're very slim, or athletic builds, they're better of on a carb diet. Which seems to go against the grain. So I wanted to know, is there are hormesis connection there?

Ari: Arguably, yeah. Now the one, maybe one important aspect to this, is you don't necessarily engage in a form of hormesis all the time. So imagine exercise for example. Let's say you said, "Well exercise is good for you. We have all this research saying it presents this disease and that disease, and makes you live longer, and makes you more energetic and so on, so if a little's good, than a lot must be better. And maybe we should have people go run two marathons a day, 7 days a week. Well if you did that, you'd discover pretty quickly that exercise actually makes you feel a lot worse, and actually makes you unhealthier. In fact, many people who overdo exercise, extreme endurance athletes, actually die at very young ages. They'll have calcification of the heart, they're have a heart attack, they'll have a stroke. You know, carious things like that. So it's important to understand that hormesis is a powerful medicine, and when you take too much of a medicine, you get side effects. And any type of chronic, hermetic, action, whether exercise, whether hypoxia, if you deprive yourself of oxygen too long, what happens? You're probably gonna not feel very good, or maybe die. Any type of these different forms of hormesis, if you go into cold, if you go into ice baths for hours every day, or ... Any type of hormesis will translate into side effects, and will actually create negative effects if you do too much of it. The same is true for carb restriction for example. And there are lots and lots of stories of people who have gone on extreme low carb diets, and have been on them ... Maybe they felt great at first, but after several months, or maybe several years, they start to notice all sorts of side effects. And this is really the same mechanism at play. Is that we need to understand that these things can be very powerful, very beneficial strategies to boost our overall health, and vitality, but if you do too much of them chronically, then they can actually translate into negative effects and side effects.

Harry: So one of the other key strategies for a super charged life and overall health, and vitality, is having a positive sense of purpose, something Ari clearly possesses. So I asked him, how does having a strong purpose give you energy?

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Ari: There are various studies that have emerged around the concept of purpose in life. And how that impacts our health and our energy levels. In particular, there's some research that has come out of studies on the people of Okinawa. And in Okinawa, this is one of the blue zones. This is one of the populations that's known for being the healthiest and longest lived populations on earth.

And in Okinawa in particular, they have this concept of Ikigai. Which translates "Your reason for waking up in the morning." Your reason for being, and your reason for getting and doing whatever it is you do life. And you could also call it your purpose in life and just your purpose in general. Now, this research has shown that having a strong sense of purpose, and this reason for being, translates into all sorts of benefits; for your brain function, for your overall health, your risk of all sorts of different diseases, your vitality, your mood, your energy levels. All of these different things relate to this Ikigai. People who have a strong purpose, or reason for being, are protected from all these different diseases, and tend to be healthier and more resilient, and more energetic than people who don't have it. So I strongly believe that connecting with your purpose, your reason for being in life, is a critical part of the equation. And you can take thousands of dollars of supplements, and you can eat the best diet in the world, and you can have the best health regimen, and do all of these things, and you can spends tens of thousands of dollars on all these fancy treatments and different technologies, and bio-hacking and so on, but if you don't have a reason for existing, a reason for waking up everyday, and a strong sense of purpose in your life that drives you, and motivates you to do what you wanna do in life, you're still not gonna be healthy. And you're still not going to be energetic, and you're still gonna have mood issues, and you're still gonna not feel very good in life. So I think a big piece of this puzzle, that a lot of people maybe lose in this process of pursing health through all these different fancy things that we now have access to, is just the simplicity of connecting with your purpose.

Wendy: Please keep in mind that this podcast is not intended to diagnose or treat any disease or health condition, and is not a substitute for professional, medical advice. Please seek a medical practitioner before engaging in anything that we suggest today on the show.