Mitochondria The Key To Your Healthy Brain Transcript

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Introduction to Dr. Capasso and Mitochondrial Health

Today we have Doctor Capasso who is going to dive into this concept of mitochondrial health. Now the mitochondria is what makes the energy in all of our cells.

And actually the brain has the most mitochondrial density per any part of the body. And that's why it's so important to optimize this thing called mitochondrial health.

So what to dive deep into today with Dr. Anthony Capasso. He attended the Ohio State University and graduated cum laude in 97 with a Bachelor of Science.

He received his doctorate in 93 from the University of Alabama at Birmingham. He completed his medical residency in medicine at University of Florida and is board certified in internal Medicine, and he has been working at the University of Florida.

Jackson was associate professor, but then became one of Jacksonville's top physicians and featured in multiple magazines and expertise in preventative medicine management, nutrition, positive hormones, and then in 2009 was voted number one physician in Jacksonville Beach.

Which is really cool. And he is a speaker at Metabolic Medical Institute, the American Academy of Anti Aging, and just a huge medical visionary. And he's a visionary behind the fitness centers, MDS and weight loss programs and products and protocols.

And he's also the director of integrative medicine as in MD next fall and host of the Top Health Docs podcast. So without further ado, I'm going to introduce Doctor Anthony Capasso.

Well, welcome to the show and thanks for being on here with us at the Better Bring Out Summit. Thanks for having me. We been throwing around this word like mitochondria.

For a lot of other interviews already. And they're, you know, there's this sort of big black box into what it is. Right? So we know it's part of the cell that like, generates energy.

Right. But how does that really relate to brain health in general. Sure. So, you know, it's it's a lot more complex than I initially thought when, when I started studying mitochondria, in mitochondria health and, you know, way back when we learned it was the powerhouses of our cells.

And it's, you know, the place that produce energy.

How Mitochondria Affect Brain Function

So and it allows our body to take our carbohydrates and our fats and our proteins and break it down to produce ATP, to kind of, you know, make things work.

And what I realized after I started reading more and more, it's really like the brains of our cells, because it senses the cell's environment and it will tell the cell to do particular things.

So not only does it produce the energy, but it also is involved with regulating the cellular function. And when you start looking at the brain and realizing that you know that each neuron has up to 2 million mitochondria in it, it's one of the most densely, mitochondria organisms in our body, probably next to our heart.

So even a small drop off of energy, can reduce the power in order to make new memories and those types of

things. But as I started to read more and more on the mitochondria, what I realized is that there's several things that can occur inside the mitochondria that can affect, how the body works.

And I know this is kind of that double edged sword that I talked to my patients about because my, you know, if you've got healthy mitochondria, you're going to age much slower.

You're going to feel great. And we know that virtually all diseases, especially the neurodegenerative diseases, there's some form of mitochondrial dysfunction linked to it.

And the question is, is is it purely just an energy issue or is or other things that could be going on. And one of the, the, you know, the double edge is when our bodies, in the mitochondria specifically are burning carbohydrates.

They produce byproducts we call reactive oxygen species or these free radicals. So if you're eating a diet that's high in carbohydrates, you're actually producing more byproducts that can injure the healthy mitochondria and the cellular function.

So and we've known that for a long time. But the thing that really, really opened my mind was that our mitochondria has its own DNA. So not only do you have DNA, you know, in your nucleus, but you've got DNA in your mitochondria and there's 37 genes in this, packet of DNA.

And so you can get DNA mutations in the mitochondria. So mitochondrial DNA mutations, which can affect brain function. I mentioned the reactive oxygen species that are produced by the mitochondria, which can injure the neurons and do that.

And then there's also how the, certain proteins are folded or misfolded and aggregates that can affect that function of mitochondria. So, you know, a little more complex than, you know, we were initially told way, way back when.

But as you start to do a deep dive, you realize, wow, how important you know that mitochondria is, and especially the mitochondrial DNA. And the thing that really, really, made me focus more on mitochondria for brain health was the fact that any type of stress, whether it's environmental stresses, whether it's, our environmental toxicities, whether it's mental stress can cause leakage of that mitochondrial DNA into the cell.

So head injuries, we know we'll do that. We know that a stressful environment will do that. We know that medications will environmental toxins will. And so so what's the problem with having your mitochondrial DNA leak into your cell is our bodies don't recognize that DNA as ourself.

It recognizes that kind of as a foreign player. So we get these really strong inflammatory responses. So part of brain injury could be occurring from the fact that our healthy mitochondria, which power our cells, are now releasing, you know, small amounts, this mitochondrial DNA under certain circumstances which can really trigger that inflammatory response causing neurologic injury.

And then, you know, the disease of the cells in the neurons. Now this is interesting because in transplant medicine, we know that organs that get transplanted, into people have a propensity of being rejected by, by the host or by the person.

And we also know that the mitochondrial DNA has a, effect.

Stress, DNA Leakage, and Inflammation

And so what essentially happens and this, you know, call it a spiritual thing, but there's a lot of cases where people are also inherited some of the memory of those mitochondrial cells.

And so there's a physiologic change in the person who who obtained the transplant that's similar to the actual host, and even dreams and memories as well.

But this is really well documented. And then another really interesting thing about it, as you're talking about it, is that we know, based on a lot of like the EEG and the quantitative EEG studies that we do, that psychological trauma looks a lot like actual physical concussive injuries when it comes to the electrical patterns of the brain.

It's very interesting you say that, you know, it doesn't matter what stress it is, as long as there's stress. That could be sort of this leakage of this mitochondrial DNA and system.

And then our body has to like, accommodate for that. Right. And so that the stressful response has as a, as a, there's a mechanism that's built in. And because we took the mitochondrial, mitochondrial DNA inherited, what we used to think it's only from the mom.

There's new evidence, especially from the mom and dad. But we used think it's from the mom's side and it's multiple generations. So mitochondrial DNA is ancient, you know?

Right. And, and, and that probably predates humans, actually. And so we're, we come from this sort of this lineage, and we have this thing called mitochondria, but it is at the root of brain health, which is what's so, you know, fascinating of what you discussed.

So how do you how do you tackle this? I mean, this is sort of complex subject. Right. But how do you tackle this from like a clinical aspect. Yeah. Yeah.

So you know, the most important thing, you know, especially when, you know, when you do more of a functional practice is really to make sure that people are balanced because, you know, sleep is very important.

You know, the most if you're not sleep, and this is what I tell my, my patients is make sure that your sleep is good, because that's the time period that the mitochondria in your cells are kind of shutting off.

The autophagy occurs. My autophagy occurs. And you need to repair all those things for the brain to function properly. So just, you know, good sleep. Probably one of the most important things that I'll tell my patients, we have to focus on getting that sleep process good.

But hydration, managing your stress, making sure that your diet is full of colorful vegetables and not high and and carbohydrates, you know, so you know, the that lifestyle balance I think has to be there at the front end.

Otherwise, no matter what you suggest or those types of things, it won't work. And, you know, I kind of look at brain dysfunction and forms of, okay, well, what are the things that protect your mitochondria?

Right. What are the nutrients that we need to protect the mitochondria? What are the, things, you know, in regards to bioenergetics that can help, support mitochondria function?

And, you know, what are the healthy fats that the mitochondria use? Right? So I think about omega three fish oils. I mean, there's a lot of studies with the omega threes and the protective benefit I think about phospholipids, right.

The lipids that are that kind of, you know, envelope the neurons that allow nutrients to come in and out. Fossil title choline. Fossil title serine. Fossil title flaming.

So, you know, diets that are high in sunflower seeds, for instance, could be a good source of phospholipids. And then, you know, other things, you know, we know that the brain primarily functions on either carbohydrates or ketones.

If you're not having carbohydrates. And it's a much cleaner process with ketone as being the, you know, the major source, MCT, you know, the one of the fats it's found in coconut oil, I found to be great from the standpoint of, you know, kind of mental clarity and energy.

I don't know if you've seen that or not, and definitely. So let's rewind a little bit, because I guarantee you, the people

who are taking notes on our talk right now are writing down supplements.

But they I don't write down that I need to sleep more. So all right. Exactly. There is a hierarchy, right? There's a hierarchy to this. It's not like you eat well, you take supplements, everything's good.

There's definitely a hierarchy. And you know what you said first right off the top is sleep. Sleep I situation it's stress. Right? Which does not require you to pull out credit card for pretty much pretty much.

Sleep, Diet, and Blood Sugar Balance

And I mean it's it is I can tell you right now, you know, the first question I asked one of my patients, and they come in when they're having mental fog is I want to get a good sleep history.

And and they all have poor sleep histories. And we know that poor sleep is linked to more dementia, more anxiety, more depression. So, you know, you have to start simply before you can actually improve, right?

Right. And we probably see similar patients who basically have a good control of everything. They're on really good supplements. They're on a really good diet.

And then when it comes to sleep hygiene, they're not they're they're, you know, too much screen time at night time really deteriorates. Sleep quality. So that's there as well.

And then we talked about carbohydrates. And then also eating vegetables is important. But vegetables are carbs. But there are different types of carbs can kind of breakdown like the good and bad carbs and what those really are.

Yeah, sure. So I mean carbohydrates in general are good, right? I mean, carbohydrate is just another term for sugar. And we break sugars down into either being simple or complex based on how quickly they get released in your bloodstream.

And what we know is, is that if you eat a lot of simple carbohydrates, in other words, you eat something in your blood sugar spike, you know, immediately after you eat it that causes a lot of problems inside our our cells and tissues.

And there's something called aggie's with these advanced glycosylated end products. So glycosylation is just a big word for sugar. The most common Aggie that most of us know about is the A1, C.

Right. This is our diabetic marker that gives us a three month average sugar. So we're looking at hemoglobin and we're looking at how much sugar is attached to it.

And I tell my patients this is like the internal sugar ization or caramelization of what's going on. And we know that that is one of the main drivers of mitochondrial dysfunction, and cellular aging 100%.

So simple sugars have a tendency to drive that process. So we really want to lower that, you know, those particular things, complex carbs get released much slower and they are better for us.

And those are the ones that you're not going to get as high of a sugar spikes. There's less likely to promote those ages. Or just, you know, increase that inflammatory kind of process.

Right? No. Absolutely. So, these are products that are highly metabolically active within our body. But as it turns out, you get these not just in carbs, but high temperature proteins.

It's like fried stuff and bacon, and even the low and slow Texas barbecue that I absolutely love. Yeah. The burnt ends, those burnt ends are actually eggs as well.

And so it's not just about the carbs. It's about like, you can you can induce a lot of toxicities of proteins as well. And

so, you know, because there's a lot of people who are watching this are either Akito or Palios, like, you know, bacon and eggs for breakfast, but no carbs, like while you're eating bacon, technically, you're eating some eggs there that spike your blood sugar, as well.

So, but yeah, in they all affect the mitochondria and it's it's really complex. It's definitely a complex topic. So recently. And I want you to kind of comment on this one.

Did experiment and, I know what my dad is going through, some metabolic and diabetic issues, and I, I, you know, to convince him to wear a CGM continuous glucose monitor.

I wore one for myself. Now, I don't have any metabolic issues or anything like that, but I learned a lot about myself. Is that if and this is this is, something that I've been noticing by myself, my brain fog comes even if I eat, like, super clean, but my stress level is high and my stress level, like, makes me like, look at the computer screen too late at night time.

My sugar stays the entire night. I like 101 to 115. All right. If I eat the same exact thing, and then I shut my brain off and do some mindful and meditative practices.

My average sugar is 76. You know, that's I know. Yeah. And and I never appreciated how how my daily behavioral habits really, really challenge, you know, my, my metabolic factors.

Right. Which kind of tells you it's not just about diet diets, about timing of eating. It's about stress reduction. It's about sleep. You know? And so what do you think is causing that, that big gap between the way my body's mitochondria is metabolize my sugars in that difference?

I mean, hands down it has to do with the the adrenal stress, the cortisol it gets released. One of the things that I see in patients which come in, which I'm sure you've seen is, you know, when you do extensive lab work, you find, you know, someone's fasting, sugar is elevated, but their A1 normal and their insulin may be kind of moderately elevated.

They may have some insulin resistance. First question I ask them is how are you sleeping? Because sleep apnea can be one of the big drivers of high cortisol.

And high cortisol can cause insulin resistance and can trigger higher insulin and more of a stress reaction that you're having. So balancing that sympathetic and parasympathetic tone, one of the most important things for getting good, blood sugars.

And and we'll see this in an athletes that overtrain, you know, if you look at them, they're like, oh, they've got to be healthy. They can't have any insulin issues or insulin resistance issues.

And low behold, they're overtraining. And when you look at their stuff you're like, wow, okay. And you know, the hardest thing to tell an athlete is to quit training or to reduce their training because they think they have to train harder and harder and harder so that that parasympathetic to sympathetic balance, one of the most important things.

And I think for what you were doing, you were realizing, wow, when I when I'm able to lower that cortisol level, my sugar control was much, much better.

Right? So yeah, it's it's it's, a common thing. I look at that and pretty much all my patients that come in because I see it so often and reflecting what you said for athletes, you know, there was a, there was a US Olympian that, wanted to get some, some, ideas as to why some things were happening in her labs.

And, I mean, she's, she's a, she's a US Olympian of that pretty, pretty, you know, pretty fit, and as clean as you can, but it's interesting is that the minute that we kind of discuss the stress and sleep and the mental health aspect, and once you targeted that, her blood would look completely different.

No. No supplements, no medications. And it's so crazy.

Exercise and Nutrients for Mitochondrial Support

How not being crazy actually can help with your mitochondrial health and your sugars and everything like that, you know, and I'll never forget that, because it's really changed the way, that kind of.

I see things when it comes to, you know, overall, overall mitochondrial health. So let's let's talk about so we kind of talked about the the nutrition briefly.

We talked about stress and and sleep. Let's talk about what are the things that the audience listening today can actually do to improve their mitochondrial health.

Right after this discussion. Sure. I mean, by far the strongest thing that improves mitochondria health is exercise is just getting up and starting to do something, and it doesn't need to be.

I got to go to the gym, but it's it's truly exercise. We know caloric restriction helps to stimulate mitochondrial biogenesis and upwards of, you know, 20% keeping your carbohydrates low, because of the effect of carbs have on, you know, the injury to our mitochondria.

You know, those would be some of the simple things. And then there's a whole slew of nutrients that I absolutely love, everything from CoQ10 to as viral to acetyl carnitine to arginine, alpha key to glutamate.

So there's a lot of different nutrients, that can support mitochondrial biogenesis, which is basically creating new, new mitochondria. Right? You're and you're the brains behind this thing called pure neuro, right.

Once you talk about what you're a neuro is. Yeah, sure. So, you know, because of the prevalence of brain disease that we see on a daily basis, I started to formulate, a product, based on how can I help preserve mitochondrial function?

How can I preserve the blood brain barrier? And, you know, and support, you know, brain function. And so as I started to, to do a deep dive into the research, one of the nutrients that really, really kind of, resonated with me was Brazilian green propolis.

And propolis is found in the protective resin of beehives. And there's over 300 natural components in propolis, including vitamins, minerals, healthy flavonoids.

And, you know, it's been it's highly regarded for its ability to provide, brain brain health and also immune support. And as I started to read more and more, about propolis, I found out that it can reduce really high levels of oxidative stress and reduce your body.

And when you start looking at clinical studies, it's, you know, it's an anti-cancer, it's an antibacterial, antimicrobial labial anti ulcer. So there's all these anti-inflammatory all these different things that it's been clinically studied.

And so I'm like, well what about the bee propolis is is you know, gives it its bang so to speak. And there's something called Kape which is the cafe acid phenol ester.

And it's a polyphenol that has incredible, incredible antioxidant capacities. And one of the studies I remember was, a Japanese study. And what they did was they, they, they exposed, human brain cells to the kind of stressors, that are, you know, that can cause injury.

And then they treated half of it with the green propolis.

Pure Neuro and Brain Protection

And they were measuring that those reactive oxygen species. And what they found is a very strong neuroprotective effect with the bee propolis. So, you know, once I saw that, I'm like, okay, this is an interesting product.

And then I read more about it. And green propolis increases something called Bdnf and Bdnf, I think of as kind of miracle miracle Gro for your brain cells.

Right. It's this protein that helps your, your your neurons survive and it helps improve growth and the maintenance of it. And so now I've got a natural substance that increases this, antioxidant capacity called Cape.

And and then increases the Bdnf. I'm like, okay, this is perfect, right? We're lowering all that oxidative stress to protect our mitochondria, protect the blood brain barrier, and also stimulating the neurons to to work better and to and to heal.

Yeah. So, decreasing reactive oxygen species means that there's less damage. Increasing Bdnf or brain drive nutrition factor means, increases the ability for the brain to, to go and to regenerate your face.

Right. Foreign. So, no, that's wonderful. And this is, it's called, pure neuro. Right? Your neuron. Yeah. And so, and everyone's interested. It's, you know, get pure neuro.com.

You can actually check that out, and we'll have the link in the description as well. So, when, when do you think is a good time to look at the brain in terms, gosh, what I do first, you know, maybe my, my stress and sleep is a little better now.

Like, is it more important to take supplements? Is it more important for you to do the whole dietary thing, or is it more important to just focus on hydration?

And we know all three are really there, right. But realistically speaking, when people try to change everything all at once is a high extinction rate, meaning that there's a high likelihood that that that they'll just stop working.

And I like to tell a patient it's going to, you know, do a stepwise approach. What do you think? What are your particular steps to, to layer on for, for people?

Sure. I guess, you know, it's understanding, you know, because everyone's different. Everyone's biologies different. It's not really understanding what that, that core issue that the patient has, you know, if you're in front of me and I know that you're only sleeping for hours or you're getting up 3 or 4 times at night to go to the bathroom, I'm going to work on that first, because I know I'm going to get the biggest bang for my belt, right?

I know that if we focus on your sleep, it's going to help with, you know, kind of resetting, you know, resetting that process. If sleep isn't an issue, then I will then I will, you know, look more towards, nutrient supplementation and those types of things while we're slowly changing the diet because diets, one of the harder things to change per se, but sometimes it's just reducing, you know, making 1 or 2 small changes.

And so giving strategies to help patients with, their diet is, is super simple, right? Like don't skip meals. Or, you know, if you do plan on you know, some it really it's understanding what their likes and dislikes are and focus on kind of what do I feel that main problem is hit that first and then I'll start working on the others afterwards.

Yeah, absolutely. And and I call that the essentialist guide to, to practicing medicine. I guess is the one lever to pull to. But literally biggest bang for your buck for the doctors book and for the patients books. Right.

Sure. To really improve this. So, earlier you touched upon, sleep and sleep apnea, for example. So sleep apnea and upper airway resistance, sort of in the same category affects 1 in 4 humans in the world, but literally 1 in 4 humans.

And so that's a huge population. And the average number of people that has, issues, from sleep apnea and upper resistance, is a hell of a lot, especially in a clinical setting and, and stuff like that.

Now, we talked about this in another segment on the summit, but there's sort of this concept of a lot of people and most people who are diagnosed with sleep apnea, diagnosis of mild, sleep apnea.

Prioritizing Lifestyle Changes in Practice

And, and I tell people that mile just means that, by the numbers, it looks mild, but then you may have a huge, severe effect. Actually, on a lot of you. Right.

Can you just kind of, give me your thoughts on on how important this, this disorder of sleep apnea is? Oh, it's huge. I mean, you know, poor sleep will upregulate over 18 different hormones.

Everything from adiponectin to ghrelin to cortisol to all those stress hormones. So if you know, if you increase the stress hormones and understand that if those stress hormones are high, it's going to injure your cells and especially your mitochondria, mitochondria.

You know, I kind of think of mitochondria as being super weak. You know, like pretty much everything hinders it. And so we have to we have to protect it.

So poor sleep, you know, just understand it's just not a sleep issue. This is a hormonal dysregulation. And your inflammation, everything is going to get upregulated and you're going to get significant mitochondrial dysfunction from poor sleep.

And that's why all those diseases that we mentioned earlier, like mental diseases, anxiety, depression get worse, neurologic diseases get worse because you're you're just continuing to injure the mitochondria, the core, you know, the root of the problem.

Right? Right. And of course, some infections, worsen as well, which is a huge, implicated, in mitochondrial dysfunction and brain health as well. And so, you know, the, we know now that sleep apnea is an independent risk factor for Covid 19 morbidity, mortality, like the propensity for me to die from Covid sleep apnea is own and have been a risk factor away from diabetes, away from from age, away from, BMI.

Right. And and body fat percentage. So it's, it's own category. So that's how important, you know, that that really is. And you know I think Covid and want to talk about that for a little bit.

Covid I think has taught the world, about mitochondrial health far more than, people realize, because now it's really common to, you know, talk to people about like, the brain fog, especially having Covid and sinus infections, stuff like that.

And we're able to talk about immune health on a much higher level of education because that the public generally didn't have prior to, to Covid 19. Right.

So this idea of post-Covid syndrome and post-Covid brain fog, how do you think the mitochondria is, is affected in something like that? Well, it's definitely affected.

I mean, you know, if you look at things that support mitochondrial health, like NRC, which is a precursor to glutathione own, you know, there's 4 or 5 different clinical studies that show that that helps improve the mitochondrial function and, and, some of those Covid outcomes.

Sleep Apnea, COVID, and Long-Haul Recovery

So, you know, when I, when I have long haulers that come in, it's all 100% mitochondrial dysfunction. And and if we support mitochondria with mitochondrial peptides like Motsi or mitochondrial supplements, like CoQ10, NAD, NMR or even a product that I put together for myself and my patients almost 20 years ago called Metal Blast.

Those are the things that really generate, you know, the, the healing of the mitochondria because, you know,

Covid, you know, the one thing that that, that Covid did, as you mentioned, would it it made people really take a look at their own health and understand that if your body has a lot of inflammation or its immune system is turned on and out of control, it's going to injure itself and again, injuring the mitochondria long term cause all those fatigue symptoms as cognitive issues.

The stuff that we see in long haulers. Yeah, absolutely. And so, final question. And, what's on pause is, what do you wish you knew when you first started your career that you learned recently that you was, gosh, I wish, I wish I knew that about, about that, at that time, what is one thing you wish you knew?

Gosh. There's probably hundreds of things that I wish I knew. All right. Yeah. You know, I think I, you know, I, you know, going to, a regular, allopathic program, I transitioned myself into more functional medicine through, you know, reading nutrients, talking to my patients that had a lot of problems, whether it was leaky gut, whether it was, you know, fogginess.

And as they went through some of their alternative treatments, I just kept my mind open. I read, and I realized, wow, you know, we can heal things if we give our body the right nutrients to do this.

Right. And to me, that's the ultimate form of medicine, right? Allowing our bodies to heal by understanding what it needs and supporting that process.

So I wish that, that transition would have occurred a little earlier. But, you know, it's also a, you know, put me in the place where I am right now, which is, you know, self studying, nutrition and hormones, and aging.

And I absolutely love the area of medicine that I'm currently in right now, so that's amazing. Amazing. Yeah.

Lessons Learned in Functional Medicine

Well, listen, thank you for for coming on. How can people find you and how can people find, what is it? The pure neuro that we were talking about earlier.

Yeah, sure. So, my my office phone number, if they want to get in touch with me, is area code (904) 694-0992. You could visit our website. Thin MD med Wspa.com if they're interested in some of the programs that we offer.

And then I provided that link. If they're interested in purchasing the pure neuro, which, I think is has been just incredible in regards to responses that I'm getting from our patients.

Right. And that's get pure neuro arcom get PR in your. Okay. So thank you very much for coming on. What a fascinating talk about mitochondria. And thanks for Gran.

Thanks for having me. Yeah. It was no problem. It's it's always, always fun discussing this. And what's great about it is, you know, our interview has really reflected on what a lot of other experts have been saying on this particular summit is that there are there are many things to really focus on, but sleep and stress and nutrition is not something that people just ignore when it comes to brain health.

Right? No matter what anybody says, right? Yeah, exactly. Yeah. It's also not it's not sexy, but it's important. Yeah. We'll make it sexy. Yeah I gotcha.

All right. Have a wonderful day, everyone. Thank you. You too. Take care.