How To Enhance Mitochondrial Function For Optimal Energy And Brain Health Transcript

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Introduction to Dr. David Jarvis

Welcome to this episode of the Reverse Alzheimer's, but I'm so delighted to introduce you to Dr. David Jarvis today. He's a doctor of natural medicine and runs one of the most popular natural health Web sites, Dr.

Doctors dot com, which gets over 1 million monthly visitors. And his work has been seen on popular media, such as the doctor, also at Hallmark home and family.

I'm really delighted for him to share what he learned about the ketone metabolic breakthrough. He's written a book about it and also about fasting. He's written the fasting transformation.

He's a world renowned expert in ketosis. And you already know from hearing other episodes of his podcast that I am also a fan of ketosis and how I have seen it clinically just transform people's lives and cognitive function. Dr.

Gikas, welcome. Thank you so much, Dr. Santos, and really appreciate you and thanks for all the great work you're doing. So you really connect the dots between mitochondria and ketosis as well as fasting to walk us through that.

What are the connections? How does this work? Yeah, well, you see, when it comes to metabolic health, our body really can run on two major energy sources.

One is glucose or sugar. And we measure that. We look at our blood glucose. And then the other is fatty acids. And I say, you know, two sources, but it's kind of like A to A and A to B.

So we have fatty acids and then we also have ketones, which are these water soluble molecules that are smaller. They're shorter than fatty acids. And the interesting thing about ketones is they can cross the blood brain barrier.

You see in times of famine. You know, our body, our blood sugar will go down in our storage of sugar, which we store sugar in our muscles, in our liver.

We call that glycogen. When that would go down, our ancestors would start to burn fat.

Ketones, Mitochondria, and Brain Energy

And we do it as well. Our body is is metabolically adapted to be able to burn fat for fuel. However, we can't get these fatty acids across the blood brain barrier.

So our liver takes a fatty acids, converts them into ketones, and now they're able to cross of our brain barrier where they are a great fuel source for the brain, for particularly, you know, the mitochondria in the brain.

And so going back to this idea of these kind of dual fuel sources, most people in society are burning sugar for fuel primarily. We're all burning all of these right at all times.

Primarily sugar and fat. However, most people are stuck in chronic sugar burning mode. This is because in our society we have plenty of food and we're constantly eating.

And particularly we're eating processed foods and higher carbohydrate foods. And so every time we eat, we're getting a lot of this, you know, we're breaking down these foods into glucose or our glucose is going up.

We have this hormone called insulin that comes out insulin's job is to take sugar, take glucose out of the

bloodstream, put it in the cells. It also brings nutrients into the cells like magnets, calcium, a lot of key nutrients into the cell as well.

And when insulin is elevated, we can't burn fat for fuel. So it it inhibits lipolysis, which is the breakdown of fatty acids for energy. So we all have kind of this key threshold for how much insulin is in our blood to where we stop being able to burn fat and create ketones.

And so, again, most people are eating every few hours and are eating foods that are higher in carbohydrates, causing more and more insulin to be released.

And then over time, they develop insulin resistance with the cells, stop responding as well to the insulin, and now they're producing more and more and more insulin.

And so they never really get into good fat, good, fat burning state. And this is really where the ketogenic diet or intermittent fasting comes in because in our society, our ancestors didn't have to do this.

They didn't have to be intentional about getting insulin down. They didn't think about it. They just ate when food was plenty and they didn't eat when food wasn't around or they ate very little when food was scarce.

And so because of that, they went through seasonal periods where they were feasting and increasing insulin and then fasting or under eating and decreasing insulin and getting insulin under this threshold where they would burn fat.

And when they were under that threshold for any length of time, their body had to create these ketones. So we had this alternative fuel for the brain.

In our society, we have to be intentional about taking breaks from eating, and we also have to be intentional about what we're eating in order to allow our body to burn fat for fuel and to create these ketones.

And the interesting thing about ketones is that when they get into the brain, they are what we call epigenetic modulators. What that means is they actually marginally modulate our genetic expression, so they actually influence the way our genes express themselves, particularly in the brain.

And that's really important because we have you. We all have certain genetic expressions. And when those genes, certain genes are turned on and certain genes are turned off, that can lead to chronic inflammation in the brain, for example.

But when we get the ketones up, it inhibits inflammation. In fact, it turns down something called the neuro inflammasome in the brain, which is like an inflammation amplifier.

We know inflammation can be great short term because it helps prevent against microbial infection. Right. And this is something that used to kill our ancestors, right?

To get meningitis. These to get pneumonia. Right. Killed, I mean, so kills a lot of people. But more of our ancestors died from chronic systemic not chronic, but systemic infections.

Infections that can spread wildly throughout their body, went into major organs like the lungs, caused pneumonia or the nervous system cause meningitis or encephalitis and killed them.

Then today, today, we we don't see that as often unless people are very elderly, maybe in nursing homes and stuff like that. But outside of that, it's not as common.

And so we need inflammation, but we need to keep it under control. And that's really what getting ketones elevated in our bloodstream and into our brain really does for us is it turns off the inflammation amplifier and allows the immune system to be more balanced and coordinated in its attack.

And that is extremely critical. It also tells the mitochondria within the cells to double basically or to create. It turns on what we call mitochondria or biogenesis or the formation of new mitochondria, and it turns on something called mitophagy, where we break down old damaged mitochondria area and we actually take the raw materials and create new healthy mitochondria.

And the reason why this is important is the mitochondria. What produce all the energy within the cells. And they're also kind of like an energetic sensor or an environmental sensor where when when they feel like we're in a, you know, survival state.

We have a tremendous amount of stress, high toxic load, high amount of pathogens. They'll actually shut down energy production and they'll become pro-inflammatory.

However, when they're in a healthy environment, when they sense that the environment's healthy, they, they they stop doing that and they turn up energy production.

And that really allows us to thrive. So when we think about mitochondria in the nervous system, in the brain, this is the most dense area for mitochondria actually have ten about tear what is it 10,000 mitochondria per neuron which is amazing.

In our muscle cells we have about a thousand a liver we have about 2000 heart. We have about 5000 mitochondria per cell. And so the brain is so dense with these mitochondria and they're so critical for our mood, our memory, our ability to think sharply and quickly, our cognitive acceleration, our ability to sleep well even can be impacted by overall mitochondrial health.

When we have mitochondrial dysfunction or a buildup of older damaged mitochondria, we call those senescent or aged dysfunctional mitochondria. They are metabolically inflexible, so they can only burn sugar for fuel and they produce a ton of oxidative stress like they rust us or age us much faster and they turn up inflammation in the body.

And so we think about neurodegenerative states, neurodegeneration, whether it's dementia or Parkinson's or Alzheimer's disease. This is marked by high levels of oxidative stress, chronic inflammation in the brain, mitochondrial dysfunction.

So going back to this idea of ketones elevated in the bloodstream, turns off the inflammation, turns down the oxidative stress gas, and also it turns up the healing and the repair process of these mitochondria and the overall number, the density of them and the overall health of the mitochondria.

And really, if we were to break down the quality of our life and we were to look at it at a cellular level, the quality of our life is really going to come down to the amount of young, stressed, resilient mitochondria, the more young, stressed, resilient mitochondria that you have in in your neurons and really all the cells of your body, the better the overall health expression you're going to have.

So when it comes to the brain, you're going to able to think sharper, quicker, have great cognitive acceleration, really good mood. You're going to able to control your mood much more effectively.

You're able to sleep better. You're going to be able to, you know, be able to recall things much quicker and perform better in your overall day to day life.

You're going to more energy. You know, we think about energy day to day energy when people say they're fatigued or they don't have any energy, that's really a mental it's really a cognitive state.

Like where do we control our energy? You know, it's like, is it is it in our heart? It's really in our brain. It's it's kind of a perceived feeling of fatigue or a perceived feeling of, hey, I feel good.

Intermittent Fasting and Ketogenic Transition

I feel like I can perform well. I can feel like I've got a lot of energy today that comes down to mitochondrial mitochondrial health, particularly in our brain, but really throughout our whole body.

And so ketones are one of the tricks, getting the ketones elevated from time to time. I'm not talking about we don't do this all the time. In fact, variability in our metabolic state is actually a really, really healthy thing and actually makes us more what we call metabolically flexible, our ability to burn fat but also burn sugar when we need to burn sugar for fuel.

And like, for example, when we're exercising at a high intensity and we don't have enough oxygen, we need to burn sugar for fuel. That's the advantage of burning sugar, is that we can we can produce energy quickly and we don't need oxygen.

Right. The disadvantage of it is it produces a lot of oxidative stress and it doesn't produce it's not as great an energy producer. We can produce energy quickly, but not as much energy as we can.

When we burn fat for fuel. So fat is a more cleaner, energetic fuel, but it depends on oxygen. And it's also takes longer, right. It's not as quick. Sugar is very quick, but not as efficient and dirtier, meaning that it produces more of this oxidative stress.

But we want to be good at burning both. And so we want to have that metabolic flexibility. And so intermittent fasting as well as practicing something like a ketogenic diet really helps us with that.

Do it connect the dots between the intermittent fasting and ketogenic diet. So even if you're not in ketosis, would you want to get into intermittent fasting or does that increase our sort of blood sugar rollercoaster that we might be on?

And could that potentially be more stressful than beneficial? Yeah, that's a great question. So if you were to take somebody that's, let's say, on a very high carbohydrate diet that's eating 6 hours a day, meaning that they consume their last meal like some sort of food with calories or even a drink with calories at, let's say nine, 10:00 at night.

And then they're consuming food at, you know, 6 a.m. the next morning. And if we were to take that person and we were say, okay, you need to do a 24 hour fast, right?

That would be very stressful on their body. Now, they may get some health benefits out of it, but it'd be very, very stressful on their system and very challenging for them kind of like in same with that person.

If we just said, okay, cut out all carbohydrates, go on a super low carb diet right away. We have to compare both of those things, those kind of dramatic changes in lifestyle, kind of like exercise.

If somebody is very sedentary or maybe they just recovered from a surgery and we were to say, okay, let's let's put you under this bench press. We're going to be bench press £200 or whatever it is. Right.

Because he used to bench press £200. So you need to do it now, right? It'd be very stressful for them if we said, you know, you need to go out and run, you know, a5k today is going to be really, really stressful and it's going to create a lot of inflammatory oxidative stress in their system.

So instead we kind of gently lean into these things and gradually build fitness. Just kind of like if we were to exercise, you know, what do you start with, right?

You start small, you start by, you know, just gradually stressing your system with exercise until your body adapts. Right? During the healing process, your body adapts and recovers.

It builds stronger, more stress, resilient mitochondria. Then the next time you exercise, you're a little bit stronger. A little bit. You have a little bit better musculo neuro neuromuscular sensitivity, right?

And and you're better at it, right? And you notice that you start getting strength increases as you go on, you recover faster. You're not quite as sore.

What's the same thing with intermittent fasting or ketogenic diet? You know, we want to kind of gradually shift into these things. And so if somebody is let's say they're consuming, you know, 250 carbohydrates a day and they're eating this, they've got this very long eating window.

What we want to do first is start to graduate. Let's say they're eating in a 16 hour eating window. I might cut I might drop them down to a 12 hour eating window where they're consuming their meals from, let's say, 7 a.m.

to 7 p.m. each day. Right. And then we might cut down their carbohydrates by, let's say, 50 or 100 grams a day. So instead of going all the way down to, you know, 50 grams of net carbs, we might drop them down to 150 or 100 grams of net carbs for the first few days.

So we're taking out the ultra processed foods, replacing those with healthier natural foods, fruits, root vegetables, then actually have carbohydrates.

But they're healthier, right? They're more nutrient dense, not quite as in slow genic types of foods. And then gradually we might start by saying, okay, for breakfast.

All right. As they're adapting to this and they're feeling like, okay, I can do this kind of diet, we'll say for breakfast, we're going to do little to no carbs, right?

We're going to do a veggie omelet with, let's say, arugula eggs, maybe some grass fed cheese in there and some bell peppers. Right. So low carb. Okay, they're cooking it on grass fed butter or coconut oil or something like that. Maybe a little bit of extra virgin olive oil on top.

So now they've got this very low carb, high protein, healthy fat style, you know, meal right here that they're consuming that's going to very do a very good at stabilizing their blood sugar.

Takeaway cravings. And then they should be able to to, you know, not notice any sort of hunger or cravings for four or 5 hours after that. So now what we do is we start to take away snacking.

All right. So we go low carb with their first meal takeaway snacking because now they're feeling natural satiation. Their body is getting better at burning fat because that first meal's not as in slow genic.

They're not producing much insulin there, so they have better blood sugar stability. So now we kind of trim it into three meals over, let's say maybe a 12 or even pushing it into a ten hour eating window right where now they're consuming their first meal at 8 a.m., last meal by 6 p.m..

So we're starting to compress the eating window slowly, right, while reducing carbs, increasing healthy fats, increasing protein. And then, you know, we start doing that with other meals, right?

So maybe the next meal instead of consuming a sandwich, right? Maybe that's what they did every day for lunch was they had, you know, a turkey and cheese sandwich.

We know the bread high carbohydrate, high glycemic load. Right. We might initially that maybe they were doing a white bread we might switch them to like Ezekiel bread for at first.

And then as they're adapting, we take them off of that all together. And now they're doing, you know, a chicken salad with extra high, high polyphenol, extra virgin olive oil on it, maybe some avocado in there.

So they got the protein, healthy fats, veggies and fiber, right. And so now we're transitioning them there. And then as they're getting more and more adapted and they have better blood sugar stability, less cravings, we can start pushing their or narrowing their eating window, compressing it to 8 hours or 6 hours and possibly even just doing

two meals a day rather than three meals.

Right. And this is kind of the gradual transition. And this might take a month, right. To transition them into a daily lifestyle where they're fasting for 16, 18 hours, maybe even doing a one day fast once a week and consuming lower carbohydrate, less in slow genic style of foods.

God, that's super helpful. Especially have those examples of what to eat. Now I tell my Asia Pacific diet is not only anti-inflammatory and great fuel for your brain, great for increasing mitochondria production of energy, but also a detox diet.

Do you share that opinion? Yeah, for sure. Because, you know, basically what it's going to do is help us burn fat for fuel. And so when we think about where does our body actually store toxins, a lot of people think we store toxins in our liver.

That's not actually true unless we unless we're developing fatty liver because where we actually store toxins in in our fat cells. And so as we start to burn fat for fuel, we're also releasing chemicals and different toxins that are promoting oxidative stress in our system.

So the better we are at burning fat, the the the less toxic load our body is going to hold on to. So this is really, really key. On top of that, we're also going to get into the state of autophagy, right?

We talk about Mitophagy where we're breaking down the old damaged mitochondria. I mentioned that earlier. Well, our body will do the same thing with all the cellular organelles.

So within the actual cell itself that we talked about, kind of outside the cell, we're talking about fat cells. However, inside the cell we have all these different components and many of them have been damaged.

Right. And because they're damaged, they're dysfunctional, they're not working. Right. And actually producing oxidative stress that's rusting these cells from the inside. Right.

Rusting the actual cellular machinery. So we need to actually get rid of those. Right. Because they're they're they're causing poor cellular health and we need to repair those organelles to create new, healthy ones.

Right. We have a whole bunch of things, endoplasmic reticulum, Golgi apparatus, and so they all have important functions. And so when we get into a state of ketosis, our body will start to break these down and will repair those cellular organelles and we get rid of the bad ones.

Right? And this is all part of the cell renewing process, which is really a cleansing and detoxification process. So yes, there's definitely a detoxification cleansing component, a healing component, a really way, way think about it is our body can either be building or healing and repairing.

And so when we're building, that's when we're in like a feast state and that's marked by higher levels of insulin. And there's a time and a place for that.

It actually tells, for example, our thyroid hormone to produce the right amount of thyroid hormone because we need to have really good, you know, metabolic machinery.

We need to turn up energy production. It turns out it helps helps our body to be more sensitive and be able to produce more sex hormones, testosterone, estrogen, progesterone.

Ketosis as Detox and Cellular Repair

However, in order to really produce the proper amount of hormones, we also need very good insulin sensitivity. And so we get that by going through periods of famine.

And that's where the ketogenic diet fasting come in. And when we're a child, right, or we're young, you know, the younger we are, the more times of feasting we need to be in.

Right? Because the more growth and building we are in when we're pregnant, woman is pregnant. She needs to be in growth and building. Right, for the most part.

That's why she's eat a lot. Right. And eat all the time. However, once we get to an adult state, we need very little times, right? Very few times of feasting. Right.

Maybe a few hours a day and then a lot of hours. Right. Maybe 20 hours a day, 18 to 20 hours a day where we're telling the body, hey, we are now in healing and repair mode.

And so we need to prioritize that really shouldn't have insulin elevated above that certain threshold for more than maybe four or 6 hours during the day.

And so by getting insulin up but then down right for a lengthy stay on it on a day to day basis, that is how we tell the body when to heal and repair and when to build and, you know, build new hormones, build new cells, go through cell reproduction.

So this is this kind of this little dance. Right. But for most people are listening to this, most of you, 99% of you are in a state where you need more repair, more healing and repair than you do feasting on. Most Americans because it's become available.

So let's go back to that. Super practical information is the requisite you're sharing. We kind of started down this path with our let's just start with the worst foods.

So what do you cut out first now? Great question. So you want to get rid of all your processed or ultra processed foods, right? So if things have a lot of different ingredients, particularly chemical sounding ingredients, great things to get rid of, right?

Try to stick with real foods, very simple ingredients, all ingredients that you should be able to eat just standalone. Right. That would be a you know, that you would eat even if something comes in like a can or something comes in a in a bag, you look at the ingredients.

Those should all be things that you would eat just by itself. Right. And then if that's the case, then you know that, okay, that's probably a good a good food.

And then the other thing is you want to look out for are sugar or anything that really elevates sugar. You know, there's a whole bunch of different things, maltodextrin and, you know, sucrose, sucrose and things like that.

Artificial flavorings like sucralose, aspartame, the chemical type sounding names. You want to get rid of those. You also want to get rid of your processed seed oils, right?

So we used to think these things were healthy. A lot of people would see things like corn oil and they would think, oh, corn. So vegetable, that's got to be healthy.

But we know that that's a seed oil. It's really, really toxic and inflammatory for the body. In fact, it takes a thousand bushels of corn to produce one ounce of corn oil.

You could easily get one ounce of corn oil if your salad dressing as corn oil is the main ingredient and you pour that on your salad. Right. And so that's very inflammatory.

It's very fragile oil that's extremely inflammatory in the body. You want to get rid of that soybean oil, safflower oil, cottonseed oil, canola oil, peanut oil, all of those you want to get rid of those those types of seed oils you want all your fats, you know, are primarily your fats to come from grass fed, organic animal products, wild caught seafood,

extra virgin, high polyphenol, fresh pressed olive oil, avocados or avocado oil.

Coconut fats. Right. So you can get that from my coconut milk. Coconut flakes. Coconut oil is all kinds of different flat products, flax. You know, when we talk about seed oils in general, I'm not a big fan of flax oil.

Okay? I'm not a huge fan of that. A little bit of flax seed I think can be beneficial. It's got lignans and fibers that can be beneficial for the microbiota.

But I'm not a big fan of the fats number one is it's primarily polyunsaturated fats and they are omega three fats, but they're the small chain omega threes and the small chain alpha omega threes.

Honestly are not overly beneficial because it actually takes a lot of enzymes. A lot of people are not able to convert the alpha component effectively into EPA and DHEA, which are the long chain omega threes that have the most benefits. Right, the most anti-inflammatory benefits, brain it, brain enhancing benefits.

So I prefer getting the omega threes from your grass fed organic animal products. When animals eat grass, they naturally produce higher amounts of long chain omega threes.

Also, your wild caught fish or Walcott Seafood will have higher amounts of omega threes. Also, you can get supplements like fish oil, for example, a purified fish oil that has some sort of antioxidant in it.

Like for example, rosemary extract some sort of antioxidant in there to help preserve it. Krill oil is another another one that's popular where people are getting that, which has asked is and then which is also a great you know that's actually is powerful antioxidant you find in wild caught salmon particularly like Alaskan salmon and acids.

Anton's an incredible antioxidant really protects the mitochondria, protects those omega three fatty acids. So you might find that in there as well to help help, help protect it and purify it.

But that's really where you should be getting your omega threes. You can also get it from like a vegan source of the algae. Right? I'm a huge fan of Lorella and Spirulina, huge fan of those.

I think they are incredible for the body as far as detoxification, bioavailable nutrients, amino acids, you're very cleansing and healing for the body.

And they also have a make a threes. Oh, they do. I don't think of them as having omega three fats. I want to make sure we double click on coconut oil and.

Hm hmm. Yeah, yeah, for sure. Well, coconut fats are great and coconut fats are also a natural source of medium chain triglycerides. And medium chain triglycerides turn quickly in the body into ketones, particularly when it comes to medium chain fats.

There's multiple there's C8, C10 and C12, Kappa Kappa Elec and Lauric acid. Okay, now coconut oil is rich and all of those 50% of the fat make up is one of those three.

But most out of that 50%, 35% of that is lauric acid work. Acid is it is C12. It's a very good fatty acids, very good for the immune system. However, it doesn't turn into ketones quickly actually does take a lot of enzymes does take some bile emulsification for that C8 and c tend to compress and capillary acid are much more ketogenic at and c eight tends to be the one that's metabolized quickly into ketones.

But that means is moment you consume that basically the body turns that right into beta hydroxy beta eight which is kind of this active ketone that we measure in our blood.

Right. That's kind of a measurement tool that we look at for your overall ketone levels. Rates is very quickly metabolized into that. It also has antimicrobial effects.

Really good for breaking down yeasts. The outer cell wall of yeast raises some some other additional benefits. There. And so coconut oil is a natural source.

And coconut oil, some people do amazing with that, of course.

Foods to Remove and Healthy Fats to Use

You know, I know, you know, with Dr. Reticence work, there are certain genetic types that don't do as well by the APO force don't do as well with a higher coconut oil diet.

But coconut oil is a natural source of these. And some people have done amazing just using coconut oil for improving their brain health. Right. And helping to reverse Alzheimer's and dementia.

But it would be good to work with somebody like you to look at a genetic type, to see how your body's responding to all the saturated fat that's in the coconut oil.

And then you can also do a concentrated C8 only MCT oil, which again turns right away into ketones. And that can be really, really powerful for the body.

In fact, I know there was a study. Where were they? All they did was add MCT oil, but I think this is probably a CHC tenancy 12 well, but that's all they did was add that to, you know, so all these people were in a nursing home and they were just consuming the standard nursing home diet, which, you know, you know better than anybody is not healthy, right?

Certainly not not going to help prevent Alzheimer's. He's going to promote it. Highly inflammatory. But what they did was they just added MCT oil to, you know, a certain population group and they had significant improvement in their cognitive scores compared to the group that didn't get it right.

So just something that simple can be really helpful. And the reason for that is because of the elevation in ketones and that epigenetic modulation that took place for bringing down inflammation in the brain.

Wow. So ketones investigate the way to take something that could potentially increase your ketone level. There's also several types of exaggerated ketones.

You have your ketone actors and then there's several others that athletes use that can get these. Your normal count of ketones are really high. Do you have insights on when to use those, how to use them safely, and how to find ones that don't taste like gasoline?

Yeah. Yeah, exactly. So the keto estas from my I have never actually taken those, but from my from what I've heard that they don't taste very good. Although I know scientists are working on, you know, trying to trying different flavor profiles to make them a little bit more palatable and they, they turn off the ketones faster than your your ketone salts.

Right. So you can get ketone salts which have been on the market for about 15 years almost now. Certainly ten years on the market. And, you know, they're marketed as exogenous ketones and those will turn up your your circulating beta hydroxy beta eight.

So if you're to test your blood ketones, they will go up and there are there's a good time and place for that. So if somebody is trying to transition their body to getting more fat adapted, let's say again, they were on a higher carbohydrate diet.

They're very poor metabolic flexibility, consuming some exotic anise ketones or the MCT oil with a meal will help to reduce cravings. Right now, the body, it takes the body a little bit of time to get used to seeing the ketones elevate in the brain developing the metabolic machinery to be actually be able to use them.

It's not like we switch over, you know, immediately, but the more frequently that seeing that, the more it's going to start to switch that metabolic machinery, you're going to notice that your cravings go down.

So when your cravings go down, even go longer periods of time without food, right? And then you out, you're probably going to consume less sugary processed foods when you do eat.

So what's that going to do? It's going to create lower insulin levels and better metabolic flexibility, and you're going to be able to produce natural ketones, indigenously produce ketones more effectively.

The real trick there is we want to get the insulin down. And so the exogenous ketones kind of act as like a little bit of a crutch, right. Or. DMcD oil by helping reduce cravings and allowing you to go longer between meals without feeling hungry, right?

So that again that starts helps bring down insulin, get your body more fat adapted so you're producing the ketones on your own and you're not and you're also becoming more insulin sensitive.

So you're not producing as much insulin when you do do eat foods. So that's the key there. Now also athletes, you know, if they're doing, you know, high level competition, they need, you know, extra fuel, right?

Their body is breaking down glycogen and store in sugar. But we all already talked about how sugar is a dirty fuel, produces a lot of oxidative stress, drives up in inflammation.

So there are times where they need to be using the sugar, like if they're in a anaerobic state. But a lot of times during these kinds of competitions, they are in a state where they have oxygen right there.

They're able to rest and get the oxygen, but they're competing for long periods of time. And so they they do need some level of fuel. And so the excess ketones are kind of a quick, great fuel source.

They can they notice oftentimes better mental clarity. They have hurt. Their perceived exertion goes down. What that means is, you know, the kind of work that would make them feel like, wow, this is super intense.

This is my peak that actually goes down. So they're able to work at a even higher clip. Right. So it's been very beneficial for a lot of athletes as they are training to become adapted to be able to use these ketones.

And then, you know, they can supplement with the ketones, right? People are doing triathlons, right. And all kinds of really intense activities can be really super beneficial.

And then there also their recovery time afterwards is better because they had less oxidative stress and inflammation from the actual exercise bout right.

And so they're they're able to recover faster. And obviously that that allows them to have a better experience with that whatever that competition was and then also be able to do it again in a quicker and more effective state than if they hadn't used those.

So I think that with our Alzheimer's patients that they're more exercise tolerant and then when they're getting something, it's exactly as ketones for our audience.

I'm really curious to learn from you what you think of as in medical speak, the contraindications to going into ketosis. So who would this not be safe for, particularly in in a group of people who is a little older.

Yeah. So getting into just like a mild state of ketosis where your ketone, your blood ketone levels are up over let's say 1.0 and maybe, you know, keeping it.

So let's say between one and two milli moles per liter. Right. That, that range I think is really pretty much healthy for just about everybody, particularly in the older population.

I mean, obviously, you know, you wouldn't pregnant women shouldn't be intentionally trying to do that for sure. But in general, it's just a adaptive physiological state.

So I think that's right. With kidney kidney disease. You know, even with kidney disease, I don't see that that's necessarily an issue. Right, because the body can still filter.

In fact, the most damaging thing to the kidneys is higher blood sugar. So when the blood sugar is elevated, the sugar molecules will bind to proteins and they create something called an advanced glycation end product.

And these advanced glycation end products are like shrapnel going through the blood vessels and they damage the blood vessels. They damage the to the tubules in the kidney and they cause, you know, further further destruction of the kidneys.

So getting your blood sugar low, your insulin low, and having your body actually using ketones for an energy source, actually very beneficial for the healing process.

You Know again these tubules need to undergo a level of autophagy to repair because there's they're full of scar tissue. So that will actually help the healing process.

So I don't actually see that as a as a bad thing. Now, there there may be some, you know, things that we need to do.

Exogenous Ketones, Safety, and Wrap-Up

For example, you know, consuming the right electrolyte balance can be, you know, important in these in these states. I think that can be that can be critical.

So I don't see that, though, as, you know, a contraindication, you know, when it comes to like a ketogenic diet or doing a lot of fasting, if somebody is extremely underweight, we do need to be careful there.

If they're saying, you know, if they're making getting into ketosis their number one goal, that may not be the best number one goal. Right. It can be a nice side benefit.

But, you know, those type of individuals need to make sure they're consuming calories, getting a lot of protein in their system. They do need to improve their insulin sensitivity.

And oftentimes and in many cases. But but you know, the number one goal is making sure they're getting the nutrients they need, getting the protein they need, so that that way they don't lose excess weight because losing muscle tissue as you age, sarcopenia, is a significant risk factor for early death.

And then on issues, what we recommend is making sure that you're doing some bioidentical hormone replacement as long as that, you know, you're working with your doctor, making sure that's safe and appropriate for you.

But testosterone especially is going to help with muscle building. So, yeah, the really important part of why to do this entire program, right, not just pick and choose, but because we want to avoid weight loss, particularly in older women who are at risk of osteoporosis and other things.

You mentioned balance. That's really important. Dr. Jeffries, this is been such a wonderful, informative conversation about ketosis and medical, and I cannot wait to share this with our audience.

I know they're going to get so much out of it. I'm really impressed by your depth of expertize and knowledge in this space, and it's adding so much value here.

Thank you. Well, thank you, Dr. Samson. Appreciate you. Remind everybody how they can find your books and your websites and your podcast. Everything that you have to offer for sure.

Yeah you can find me on Dr. Shockers dot com Joshi KRS also my podcast Dr. Jacobs Functional Nutrition podcast and I'm on all the different social media channels, Instagram, Facebook, and then my books are at the Keto Metabolic Breakthrough and also the fasting transformation.

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