THE MODEL HEALTH SHOW

EPISODE 596

Use Neuroscience To Optimize Your Nutrition & Longevity

With Guest Dr. Lisa Mosconi

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SHAWN STEVENSON: Welcome to The Model Health Show, this is fitness and nutrition expert, Shawn Stevenson, and I'm so grateful for you tuning in with me today. Brain health has never been more important. The human brain is regulating so many aspects of our reality, so many aspects of our health. There's a master regulator in the human brain known as the hypothalamus, for example, it's part of the HPA axis, the Hypothalamic Pituitary Adrenal axis, and is responsible for regulating, kind of overseeing so many different metabolic processes, for example, the hypothalamus is in direct communication with our gut and sending data back and forth to determine our needs for caloric intake. And based on that data, based on the assumption that our brain and our gut has about our caloric needs, our brain can literally tell our gut to decrease the assimilation of calories from the food that we're eating, or increase the assimilation from the calories in the food that we're eating, again, based on the perception of our brain and its communication with our gut, it's really, really powerful. This is just one aspect of how our brains are regulating our metabolism.

Also, within the hypothalamus, is really noted to be this kind of internal thermostat that's regulating literally our body temperature, but also regulating our metabolic rate, the rate at which we're expending calories. And on top of that, it's an interface that's connecting our endocrine system, our hormones, and our nervous system. Right? So, our brain is kind of the crown of our nervous system, is the crown jewel of our nervous system, but our nervous system extends throughout our entire bodies, of course, and our nervous system has a lot to do with managing and figuring out our body's association with our environment, and releasing hormones based on, again, our perception of what's going on in the world around us and what's going on within our own bodies. So, our nervous system, for example, is able to sense pain if there is an alarm going off, if there's something that needs to be addressed and sending vital resources. So, our hormones are kind of these metabolic messengers that are sending communication between all the cells in our bodies, and again, this is a very complex communication, however, there's a simplicity, there's this beauty to it all, and our brain is that interface that's responsible again, for so many metabolic but also cognitive aspects of our reality.

So, our ability to make decisions, for example, whether those decisions are good decisions or questionable decisions, our reaction time, our ability to perspective take, to have forethought and map things out, different scenarios. This is one of the amazing things about the human brain, to be able to do thought experiments and to see what would happen if I take a certain action or don't take a certain action and play out different scenarios. It's a wonderful capacity that we have as human beings, but also, if we're not aware of our capacity to do these things, those mechanisms can kind of go a little bit haywire and get out of control where we're

thinking about so many different possible scenarios and problems and worries that it can make us incapacitated and create a scenario where we're not taking action, we're constantly in fear. So, this can drive up anxiety. And this term anxiety has become a rampant issue in our culture today, and I say this term anxiety because there's so many different expressions of what that can be. No two human beings are the same, and no two expressions of anxiety are the same, because we're all completely metabolically, cellularly, and even our unique combination of genes and genetic expression, we're all unique.

And so, we're looking at, what are the tools, what are the foundational principles that we can utilize today for all of us so we can tune into what's happening in our own bodies to create a healthy brain, a healthy nervous system, healthy hormones, and live a far healthier life in a world that right now is not in a very healthy place overall. Not many people are aware that severe cognitive decline has been rapidly increasing in our society today, and specifically, neuro-degenerative conditions. Right now, Alzheimer's disease, one of the most common of these neurodegenerative diseases is in the top 10 causes of death, it's inching its way into the top five. Now, this episode today is about, number one, defending our brains from this degradation, from this cognitive decline, and learning from one of the very best experts in this space, but also not just defending our brain from diseases, but how do we optimize our cognitive performance today, so that we can have better outcomes, so we can have great cognitive performance, great brain health and overall improvement in all the downstream things, again, from our metabolism to our mental health, so I'm really, really excited about this.

And I wanted to provide some insight from specifically someone that I know that I've had the opportunity to work with several times, who is literally looking at the brain as a neuroscientist, looking at brain imaging to see, are these implementations actually making a beneficial impact on the brain? When specifically, we're talking about nutrition, which nutrients are able to waltz their way into the exclusive area in our bodies? Because the brain is very protective internally and externally, and which nutrients actually make a difference? And so today we're going to combine together two powerful interviews with this expert, and I promise you, it's going to be a game changer, so many powerful insights for ourselves and our loved ones. And this first segment, this is true story, true story, the first segment. She's been working at NYU, New York University for many years, and so I popped into New York City to do some interviews myself, I was doing some media, and I had a plug for this recording studio, so I was just like, "Hey, come on over to this recording studio, and we'll do a show while I'm there." And this recording studio, true story, this was the same recording studio, where Biggie Smalls laid down some tracks, where Snoop Dogg, laid down tracks, Busta Rhymes, bust the bus, all right. So needless to say, the aroma in the walls was permanently there. Alright, talking about the cannabis is permanently permeating in all domains. So, there was no...

No sparking up in the studio at this point, but years and years of it had gone by that you just can't get away from it. Alright, so I've got this prestigious NYU professor coming in here, and I know she caught a contact... I know she did. Alright, there's a special vibe, it's coming off through this interview, and maybe it's just us, or maybe it was a little bit of an influence of the studio, but this is one of the cool things about doing this work, is that I have these great opportunities to be in places like this, to connect with industry-leading, world-changing voices and thinkers, and to create these wonderful scenarios, where we're getting together in a really interesting dynamic and being able to provide some insights tools and strategies for all of us to utilize starting today. So again, very, very excited about this, and one of our mutual loves from the nutrition perspective is the benefits because it has such remarkable benefits on the human brain is green tea, but specifically, there's a specific type of green tea that has the most incredible benefits. Green tea contains an amino acid called L-theanine and it's one of the rare nutrients that can gracefully dance its way across the blood-brain barrier and provide a fuel that actually increases the activity of a neurotransmitter called GABA.

And this particular neurotransmitter is able to reduce anxiety and help us to feel more centered and relaxed, this is definitely a needed component today, when we want to be productive, when we want to be focused because our attention is truly at a premium, and another way that L-theanine works to improve our focus is noted in a peer review study published in Brain Topography, the Researchers observed that L-theanine intake literally is able to increase the frequency of alpha waves in our brains. Specifically, this indicates reduced stress, enhanced focus and even increased creativity. Alpha waves are associated with this state that is "being in flow," it's very difficult for us to articulate this through a language, because it's a state that we've all experienced where we're just in the zone, we're locked in, we're in flow, everything is kind of firing on all cylinders, but there are certain things that help us to get into that state.

And really that state is associated with a certain patterning in our brain, and green tea specifically, matcha green tea is one of those cool things that helps us to nudge our way into that alpha wave state. Now, I drink Sun Goddess Matcha, and this is exclusively from Pique Teas, it's shaded 35% longer for extra L-theanine and it's crafted by a Japanese tea master, and there are less than 15 Japanese tea masters in the entire world, and it's the first Matcha that's quadruple toxin screened for purity, because there's a huge issue in the industry when we're talking about teas with microplastics, molds with pesticides and herbicides and Rodenticide, and even if they aren't grown using those things, just the cross-contamination issue that's happening today, and of course, there's nothing added, there's no preservatives, no sugar, artificial sweeteners. Any of that stuff. And again, it's the best Matcha out there on the market today by far. Go to Piquelife.com/model that's P-I-Q-U-E-L-I-F-E.com/model. You get 10% off the Sun Goddess Matcha and every other tea that they carry, they have over 20 award-winning flavors. So much to choose from. Huge fan of the Matcha green tea. Also, the cinnamon fasting

herbal tea is great. I love the PU'ER. So many great teas over there at Pique life, go to Piquelife.com/model for 10% off.

And now, let's get to the Apple Podcast review of the week.

ITUNES REVIEW: Another five-star review titled “our personal vibe check” by Hisel. “This podcast is truly reshaped my mindset and my daily habits, Shawn not only has wonderful lessons and reminders for all of us, but he also acts as a personal vibe check when you listen to each episode. Recommended this podcast to so many... And I won't stop till everyone hears all the knowledge that Shawn drops in each and every episode. Thank you, Shawn for spreading magic and hope in our lives.”

SHAWN STEVENSON: This is absolutely amazing, thank you so much for leaving that review over on Apple podcast, that hit my heart, I appreciate you so much. And if you've yet to do so, please pop over to Apple Podcast and leave a review for the model health show. And on that note, let's get to this special compilation from one of the leading experts in brain health and cognitive performance in the world. Today you're going to be hearing from two powerful conversations from Dr. Lisa Mosconi, and she's the director of the Women's BRAIN Initiative and Associate Director of the Alzheimer's prevention clinic at Wild Cornell Medical College, where she serves as an Associate Professor of Neuroscience and neurology and radiology. In addition, she's an adjunct faculty member at the NYU department of psychiatry, and the author of two best-selling books, the XX brain, I.e the female brain and Brain Food. Now, let's jump into this incredible compilation with the Amazing Dr. Lisa Mosconi.

DR. LISA MOSCONI: Nuclear medicine is really code for radiology with Radioactive isotopes, so when you look at scans of the brain where some parts are blues and some parts are red and yellow that is nuclear medicine, we look at functionality inside the brain, the biochemistry of the brain. Now I thought it was the coolest thing ever so that's what I wanted to do. And they immediately put me to work on a project about Alzheimer's disease because they were so interested in that, and they never stopped, so I've been working in the field of Alzheimer's for other...

SHAWN STEVENSON: Driven by your family members?

DR. LISA MOSCONI: Yes, and specifically, I was interested in prevention of Alzheimer's and what causes Alzheimer’s? What triggers it? And what do I do to stop it? Right, and so then I moved to New York to look at the genetics of Alzheimer’s. And within a couple of years, they were just so disappointed because... I mean, in a good way, because it turns out that genetics doesn't play such a big role as we previously thought they would. So, there are some genetic mutations that cause Alzheimer's, but that's really less than 1% of the population.

SHAWN STEVENSON: Less than 1% of the population?

DR. LISA MOSCONI: Less then 1% of the population.

SHAWN STEVENSON: Is it direct genetic mutation, resulting?

DR. LISA MOSCONI: Yes, yes.

SHAWN STEVENSON: Wow.

DR. LISA MOSCONI: Much... Yes, less than 1%. That doesn't... That is not to say that genetics don't count.

SHAWN STEVENSON: Absolutely, absolutely.

DR. LISA MOSCONI: Of course, everybody has a genetic makeup. We have genetic risk factors, but they're not as impactful as we previously thought, they would be.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: And so instead of thinking, well, what then makes the difference here? And that's how I started looking into lifestyle. And specifically, nutrition because it was really my research that pointed me to diet, as a major factor that impacts the health of the brain. Because I was looking at everything, I was looking at exercise, intellectual activity, diet, nutritional quality, vascular risk factors, all sorts of vascular risk factors that are known to impact the brain, obesity, diabetes. And when you put them all into your statistical model, and you have the brain as something you're trying to predict, diet is the one factor that kind of always stands out.

SHAWN STEVENSON: Wow.

DR. LISA MOSCONI: Accounting for everything else.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: So that really convinced me that the diet had a huge role, and then I founded... I started a lab when I was with the NYU, it was called. It's not a great name, but it's the Nutrition and Brain Fitness Lab. So, scientists are vetted to the point.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: Nutrition and Brain Fitness Lab. And we were doing brain scans, which is really... It was really new back then, because everybody would just measure your diet today, and then wait 10, 15 years until you either developed Alzheimer's or do not, right? And then they would collect information on hundreds of people and then go back to the data they had collected 20 years prior and go like, "Oh, the people who 20 years later developed, Alzheimer's ate a lot of saturated fat, a lot of trans fats, a lot of cholesterol and the other people did not." But that's really bypassing the brain.

SHAWN STEVENSON: Right.

DR. LISA MOSCONI: For me, I want to know what's happening inside your brain, as you eat certain foods and as you follow a certain diet, and can I change it?

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: So, I decided to use brain scans to do that, which was... Is still kind of not really common practice.

SHAWN STEVENSON: Yeah. It is definitely not.

DR. LISA MOSCONI: No.

SHAWN STEVENSON: Definitely not. And you actually talk about this, the fact that the brain has really its own unique diet.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: And you call this neuro nutrition, and it's different from that of the rest of the body.

DR. LISA MOSCONI: Yes. It is.

SHAWN STEVENSON: Which is really interesting. So why? Why is that?

DR. LISA MOSCONI: Yes. So, I also thought it was really fascinating, as a scientist we're not trained in nutrition. Zero.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: Medical doctors are usually not trained in diet and nutrition either. So, when I was studying, I studied a lot of biochemistry and I was reading all these names like Magnesium, Potassium, Sodium, Phospholipids, Choline. And they never question, but where do they come from?

SHAWN STEVENSON: Yeah. Right.

DR. LISA MOSCONI: Right. I just assume, well, it's something that's inside your brain.

SHAWN STEVENSON: Same thing. For me, same thing.

DR. LISA MOSCONI: Right. And instead, they're from the foods you eat. And that was for me, it was really like, whoa, I never really... I never thought about it.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: And I took a lot of biochemistry.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: A lot, Neurochemistry actually. And so, I started doing a lot of research in that regard, and most of the studies are from the '70s and the '80s, like they were done so long ago that basically we have lost trace, because they were published in print, right? There are no electronic copies of that, so I had to go back to the library, which is a fantastic experience.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: So quiet and really... Yeah. And really just request scanned copies of the super ancient papers, but it turns out that... So, the way the brain works is fascinating to me. So, the brain is an incredible organ, and it's actually the only... Is the most protected organ in the entire body. And that's in part why we don't associate that with food because we're taught in neuroscience school or medical school that the brain is isolated from the rest of the body. It's literally shielded...

SHAWN STEVENSON: The blood brain barrier.

DR. LISA MOSCONI: By a blood brain barrier, right? That just enables specific substances to go inside the brain and kind of precludes access to everything else. But the truth is that this barrier has little gates, right? That are specific for the nutrients that the brain needs, and the

brain itself opens the gates and then closes them back, once it got the food it needs. So, there are specific gates that tell us what kind of nutrients are good for the brain and needed by the brain, because these are the only nutrients that the brain has gates for.

SHAWN STEVENSON: Right.

DR. LISA MOSCONI: And that can get inside the brain. And they're really a handful, like there are about 100 nutrients that are important for health overall, but the brain only has access to, I'm going to say 30. And we need to constantly replenish these nutrients because the brain needs them.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: We have little sugar gates. So, the brain... When the brain glucose levels go down too much, then the brain will just open the gates and allow the glucose to flow right in, and when it's done the gates close. So, it's not us, we are not necessarily influencing the brain nutrition as much as the brain itself saying, "Oh, I'm hungry, I'm not hungry anymore" And that's very special because it doesn't happen in the rest of you, and I thought it was beautiful, right? Such a strong protective mechanism that also guides us in terms of what kind of food and nutrients we should be eating.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: On a daily basis. And what kind of foods and nutrients are not that helpful instead.

SHAWN STEVENSON: There are so...

DR. LISA MOSCONI: At least for the brain.

SHAWN STEVENSON: There are so many interesting things in your book and the way that you stated certain things really just kind of like set off a light bulb for me.

SHAWN STEVENSON: And I want to ask you about what makes brain cells different from other cells in our bodies.

DR. LISA MOSCONI: They don't die.

SHAWN STEVENSON: Because... Yes.

DR. LISA MOSCONI: Yeah. They're irreplaceable. So, in the rest of the body, all the cells' regenerates. So, there's a specific turnover. Like for instance, red blood cells, die and get replaced all the time. Hair, people lose hair all the time, but then they grow them back. And that's why even short diets have an impact on the rest of the body because your cells have a turnover that can easily be modified, right? So, when the new cell is born, you are affecting the development of the new cell. So, you can kind of control and guide your body to do certain things, not inside the brain. So, our brain cells are born with us, stay with us for a lifetime. They die with us. And the way it works is then, there's an explosion of neurons as soon as we're born. And then there's actually a lot more brain cells inside your head than stars in the Milky way.

SHAWN STEVENSON: See this goes back to that Star Trek I was talking about at the beginning.

DR. LISA MOSCONI: Everything is about Star Trek that's... But then as the baby develops, some of the connections, some of the neurons are lost. And then by the time we reach adolescence, we pretty much have all the brain cells we're ever going to have. And there's been a lot of work showing that neurogenesis continues also in the adult brain. So, neurons keep growing and keep being formed. But in reality, it's just really a minority of brain cells. It's just so cute...

SHAWN STEVENSON: In certain places in the brain.

DR. LISA MOSCONI: Yeah. They're like in the hippocampus, in the memory center of the brain and other parts, but by and large, that doesn't really happen if it does happen, is dendrites. So, then it's like the appendixes of the neuron, not the neuron itself. So, we really have to take care of our neurons because they can't just be replaced.

SHAWN STEVENSON: I think that's one of the biggest insights I want people to get today. Is how important it is to take care of those cells because you don't get new ones.

DR. LISA MOSCONI: Yes, you can't, also, you can't change them as easily as the rest of you. So, if you read like in a book that in 21 days, you're going to change your brain forever. It's just not true. It's impossible. It is biologically impossible. It takes time. It takes time and consistency.

SHAWN STEVENSON: And also, there's something interesting about the brain. And I would see this, of course, when people come into my office experiencing, migraines and headaches, they're thinking, and I remember growing up, like, you think your brain hurts. But that's not actually reality.

DR. LISA MOSCONI: Yeah, I know it's your muscles in the neck and even here in the head.

SHAWN STEVENSON: Because the brain cells don't have pain receptors.

DR. LISA MOSCONI: Oh, they do not have pain receptors. So, you cannot... The brain cannot feel pain.

SHAWN STEVENSON: That's nuts.

DR. LISA MOSCONI: Yeah.

SHAWN STEVENSON: And so even with that said the brain not having pain receptors, it's not like your hand that can tell you that it needs some treatment right. So, can you talk a little bit about that?

DR. LISA MOSCONI: Yeah. So, well, the brain is not able to feel pain because the brain is in charge of feeling pain everywhere else in the body and making sure that we address that pain. Right. If we had pain receptors in the brain, we would be really in trouble because we just couldn't think straight most of the time. The problem with that is that it's very hard to understand the health status of your brain, that we have no access to what's going on inside our brain, is our brain in trouble? We don't know. And we will not know until there are symptoms that become evident in terms of behavior or like movement disorder or insomnia, or basically we need a deficit to know that the brain is in trouble. And that also speaks to prevention really. We should not wait that long because that means then, whatever is going on in the brain that's causing the symptom has reached and passed a threshold. That just makes the brain itself unable to deal with that. So, by the time you get to that point, you have a disease, or you have a condition that is severe and needs attention...

SHAWN STEVENSON: And now we're able to look again, look at the organ that was so hidden and so protective, and you can see where the potential areas might be or potential areas of trouble. And you can prescribe certain plan of action based on that.

DR. LISA MOSCONI: Yeah, for sure. We do... So, the Alzheimer's prevention clinic that I'm associate director of, we do brain imaging on all the patients in my studies. And also, I used to do it at NYU for 12 years. Before I moved to Cornell. And in younger people, it's rare to find like an actual, severe problem, but it's very common to find aneurysms that are growing, brain tumors, they're so common. They're so much more common than anybody would imagine. And they're not necessarily malignant, they could be benign, but it is something that requires attention. And if you have some symptoms of memory loss and confusion, it's very likely because something is pushing against your brain and is creating issues or, hydrocephalus that when you have too much fluid inside your brain or brain inflammation, that's a problem or brain atrophy is something we need to address.

And a lot of things that happen in the brain are really related to food and to food choices, because the brain uses neurotransmitters to communicate, for brain cells to communicate with each other, they use neurotransmitters like, serotonin, which I'm sure you talk about in your book, dopamine, Acetylcholine, which is the neurotransmitter that makes memories inside your brain. And they're all built on food. On very specific nutrients that the brain needs in order to make these neurotransmitters.

SHAWN STEVENSON: Yeah. And I want to get all into that. I want to ask you first about this concept, that the first time I've seen this was this concept of brain reserve. Can you talk about that please?

DR. LISA MOSCONI: Sure. So, because brain cells are by and large irreplaceable, the health and the quality of your brain cells give you some kind of reserve, which is basically, it's like...

The higher the quality of your cells, the more resilient your cells are, the healthier your cells are, the more interconnected your brain is, the higher its ability to withstand insults down the line, right. So, it makes sense that the healthier you are, the better you'll be able to face a number of issues down the line. You get a cold; you just get back in shape in a day. But if your baseline is not that good, then it's much easier to get sick or to be more vulnerable to a number of things that can happen.

SHAWN STEVENSON: So, it's kind of like a reservoir?

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: Like just utility that can go and if it's built up in a strong way.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: Okay, so we really want to...

DR. LISA MOSCONI: It gives you resilience against disease and against aging, and the sentient that we need to cultivate really over a lifetime. And it's not just genetic. So, when this concept developed, it was assumed that your genes played a huge role in determining your brain reserve, and then some people are just more genetically blessed than others. And now instead, it turns out that it's really, sure there is a genetic component, there's some kind of blueprint that comes from your parents and from your DNA. But the way you live your life has a huge effect on the health of your brain.

SHAWN STEVENSON: So, shout out to people that are blessed with the good brain, but also there's, we all really are. We have so much potential and man, this is so fascinating. So, let's talk about food.

DR. LISA MOSCONI: Let's talk about it.

SHAWN STEVENSON: Let's talk about how food relates to the form and function of the brain. First, let's start with the form of the brain itself. What are our brains made out of?

DR. LISA MOSCONI: Well, our brains are made of food, are made of nutrients, right. So, the brain is made of chemical...

SHAWN STEVENSON: Wait, hold on. So, I just want people to get this. Your brain, responsible for everything in your reality, is made of the food you eat. Please continue.

DR. LISA MOSCONI: Well, so the brain is made of nutrients. The brain is made of chemical molecules that we call nutrients, with the difference that the brain makes a lot of the nutrients on its own.

SHAWN STEVENSON: Which is different for people because we might think like these Cheetos or whatever, is going to become my brain. It doesn't work like that.

DR. LISA MOSCONI: No, it doesn't work like that, although they will have an impact.

SHAWN STEVENSON: Yeah, definitely have an impact but more likely, you can make other tissues out of these different foods, whereas your brain makes a lot of these nutrients or these compounds itself, which is very fascinating.

DR. LISA MOSCONI: And I think it's important to clarify that, I've read it very often that the brain is made of fat and so we should eat a lot of fat to replenish brain fat. And that cholesterol is very prevalent brain fat and saturated fat is prevalent in the brain, but in truth, the brain makes them on its own. So, cholesterol is made only, only by the brain as soon as we're born. And brain cholesterol is completely sealed away from the rest of the body for the entire time that we're alive. There are no gates in the blood brain barrier for cholesterol, so no cholesterol from food will ever be part of your brain. So that's the first thing. Saturated fat, there are gates for saturated fat, the smaller ones, but what happens is that the brain opens the gates when we're little. So, children, all the way throughout adolescence, but then these gates pretty much close.

SHAWN STEVENSON: And that makes sense because of the...

DR. LISA MOSCONI: Because the neurons are done. The brain has already all the neurons that it needs and so cholesterol and saturated fat in the brain only have a structural role. The brain cannot burn fat for energy. It is the only organ in the body that just can't burn fat for energy so whatever fat is in the brain, is just to give a structure. And to just keep the neurons in a certain position and to wrap them with cholesterol and other fats, so then, it acts like a conductant so that the information, the electrical stimulus, can fly faster, from one end to the neuron, to the next neuron.

SHAWN STEVENSON: Because the physical brain itself is mostly fat and water?

DR. LISA MOSCONI: Is mostly water, 80%.

SHAWN STEVENSON: Water and then fat and then protein?

DR. LISA MOSCONI: Fat and protein is kind of a tie.

SHAWN STEVENSON: Pretty close?

DR. LISA MOSCONI: Honestly, yeah, once you take water out of the equation.

SHAWN STEVENSON: And then probably vitamins and minerals?

DR. LISA MOSCONI: Yes, and very, very little carbs because they're just being used instantaneously. They just don't have time to sit around.

SHAWN STEVENSON: But a lot of those fats and again, it makes sense as well, just with nutrition for an infant, for example. You're going to have that constituent breastmilk; it's going to be more saturated fat.

DR. LISA MOSCONI: Yeah, you need it...

SHAWN STEVENSON: And yeah, that makes so much sense.

DR. LISA MOSCONI: But then you don't need it anymore when your brain is done. Once you have a brain...

SHAWN STEVENSON: I don't know who's making like breast milk smoothies out there, but, well, in truth, I mean, I guess if you're getting any kind of milk... Never mind.

DR. LISA MOSCONI: No. Well, in principle, it makes sense, but not after a certain age, I think.

SHAWN STEVENSON: Right.

DR. LISA MOSCONI: But so, the only kind of fat that can get inside your brain, and the brain needs and wants, is called long-chain polyunsaturated fat.

SHAWN STEVENSON: The PUFAs?

DR. LISA MOSCONI: Which in English... Yes. So that would be Omega 3 and Omega 6 polyunsaturated fatty acid or PUFA. So that's all-in line with fish...

SHAWN STEVENSON: I think it's a terrible, like that acronym, it just sounds bad.

DR. LISA MOSCONI: It's horrible. There's PUFA, MUFA, SFA.

SHAWN STEVENSON: MUFA?

DR. LISA MOSCONI: MUFA. Monounsaturated.

SHAWN STEVENSON: I don't know if somebody called me a MUFA. I don't know, these are fighting words. Oh, my goodness. So, but those Omega 3s and Omega 6s specifically are, those are essential?

DR. LISA MOSCONI: Those are essential fats, yeah. Those are the only essential fatty acids that the brain cannot make.

SHAWN STEVENSON: Got to get those in via our diet.

DR. LISA MOSCONI: And we need to eat them daily, especially the Omega 3s because...The typical Western diet is pro-inflammatory, it's very rich in foods that contain a lot of Omega-6. And so usually the ratios lie 10 to 1 or 20 to 1. Whereas a good ratio for a healthy brain is more like 2 to 1. So, two Omega-6 for every one molecule of Omega-3, that's the good ratio. Let's say 4 to 1 is acceptable, but 10 to 1 or 20 to 1 is too much pro-inflammatory fat.

SHAWN STEVENSON: Yeah. And I guess like a systemic inflammation that's going to affect our brain probably as well.

DR. LISA MOSCONI: Oh, for sure. Yes. So, the brain is the most metabolically active organ in the body, right. It takes over 20% of the entire energy production in inside the body. But the brain is also really delicate. It's very, very sensitive to oxidative stress, which is the formation of free

radicals. And so, it's very easily inflamed and oxidized, which is like the rusting effect that makes your cells age faster. So, a pro-inflammatory diet just literally makes your brain age faster. You don't want that.

SHAWN STEVENSON: We don't want that.

DR. LISA MOSCONI: No.

SHAWN STEVENSON: Oh, my goodness. So physical structure we got water, fat, protein, minerals, and vitamins specifically... And we'll get into some foods and just dive a little bit deeper on those Omega-6 in a moment.

DR. LISA MOSCONI: Yeah. This is a lot of chemistry.

SHAWN STEVENSON: So, I wanted to ask you about again, just to reiterate a little bit about this blood brain barrier or the BBB. Makes since we're making acronym, not big baller brand, so no disrespect to, is it Lavar Ball? I don't know, the Ball family. Just, yeah, don't worry about it you just keep doing science.

But this blood brain barrier is very specific, and you said there's about 30 things, just around 30 things, 30 nutrients that are going to be able to actually access and get in the brain itself because your brain is very selective, even though it's very metabolically active. I think it's somewhere as like using like 25% of your caloric intake. Crazy. But it's very selective it's very choosy.

DR. LISA MOSCONI: Well, thank God it does.

SHAWN STEVENSON: Yes, exactly. It's a choosy lover. So, I wanted to just circle back really quickly and ask you about the cholesterol. So, the cholesterol, obviously dietary, we're seeing new insights about it being important for... But first of all, your body's making a nice amount of it, your liver, to do this process because it's a kind of a prerequisite to making sex hormones, for example. But that dietary form of cholesterol is not the same that you're going to see in your brain, because again, your brain is able to make its own. Is that right?

DR. LISA MOSCONI: Yes. So, the brain makes neurosteroids that are different from the rest of the body. And cholesterol is a special blend inside the brain, which is different from the rest of you. I mean it's the same substance, but it has different uses and different functions and just can't get in touch with the rest of the cholesterol. So, there's blogs or books that say you should eat a lot of fat to get smarter or happier or whatnot. It's just not true. It's just mainly not true.

SHAWN STEVENSON: Yeah. It doesn't work like that.

DR. LISA MOSCONI: No, but they can increase your risk of heart disease, hence that, so that's something to consider.

SHAWN STEVENSON: Especially a lot of the wrong stuff.

DR. LISA MOSCONI: So, we have shown that even though this fat, cholesterol, saturated fat, trans and saturated fat, they can't get inside the brain. They do have some indirect effects because not for everybody, but in some people, they really can produce inflammation. And the inflammation that you have in the rest of your body is able to get in the brain as well, because cytokines can cross the blood brain barrier. So, if you have inflammation in the rest of you it can also affect your brain indirectly. And of course, if your heart is suffering, then your brain suffers as well.

SHAWN STEVENSON: Right. If it's bad for your heart, it's bad for your brain.

DR. LISA MOSCONI: Yeah. There's a saying in cardiology, "That you're only as old as your arteries are." which is so true. It's really true because if your arteries are not nice and clean, then blood can't get to the brain, oxygen can't get to your brain, cannot get inside your brain. And then your brain starts aging faster because it really needs it like constant, like blood flow to the head is a major predictor of brain health. Brain function.

SHAWN STEVENSON: So, we've got water and we've got fat, slightly more fat than protein is close. So, with protein, all protein or?

DR. LISA MOSCONI: Essential amino acid.

SHAWN STEVENSON: Yes. So those are the ones we're looking for in our diet.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: So, with that said these essential aminos. So those are some of the ones that the brain has those gates for.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: Okay. Alright got it. So, there's certain vitamins, minerals, proteins, and fats. So, I want to now talk about function. So, we talk about form kind of what the brain is made of. So, let's talk about which nutrients do we know are critical for the function of a

healthy brain. And I want to go first through some lesser-known ones and then get more to the known ones. Everybody at this point hopefully has heard about the importance of Omega-3s for their brain, but now to know specifically from you, a neuroscientist that this is actually getting there. I want to talk about that for sure. But let's start with... Let's talk about choline. What is that?

DR. LISA MOSCONI: Let's talk about it. It's a B vitamin So choline is a B vitamin that is used by the brain to produce acetylcholine and acetylcholine is a major neurotransmitter that the brain uses to produce memories. So, we need B vitamins, especially choline. Did you say choline or cho-line?

SHAWN STEVENSON: Choline.

DR. LISA MOSCONI: Choline. Okay so I'll say that too.

SHAWN STEVENSON: But I like how you say it too.

DR. LISA MOSCONI: In Italian I say Cholina.

SHAWN STEVENSON: Oh, my goodness that's the cutest thing I've ever heard in my life. So, choline and for me I would go for eggs. I would go for Bee pollen is a good source.

DR. LISA MOSCONI: Royal jelly. Yes. Bee pollen.

SHAWN STEVENSON: See, and I didn't see this in your book I don't know I'm not through all the book yet, which I love this book I'm going to... There are certain books that I just feel that it's like mandatory. Like if you really want to be... Really masterful about your health. I think it's so important for us to understand our brains.

DR. LISA MOSCONI: I agree with you.

SHAWN STEVENSON: And I cannot believe there's not a brain food book specifically and then created by somebody who's been in the lab and like looking at this stuff. And it's just like, you're basically like an X-man. You're like a mutant of health like to have both of those sides.

DR. LISA MOSCONI: It is bizarre. It is unusual.

SHAWN STEVENSON: It's like a big confirmation for certain things and in other things it's just like, well, that makes sense. Let's just toss that whole concept out. And so, I'm just... I love your book. So...

DR. LISA MOSCONI: Thank you.

SHAWN STEVENSON: Choline is one of them.

DR. LISA MOSCONI: Yes. I have more sources. Oh, can we talk about caviar or fish eggs?

SHAWN STEVENSON: Let's go. Let's do it.

DR. LISA MOSCONI: Let's do it. So...

SHAWN STEVENSON: What's the other? There's caviar and there's some other little eggs as well.

DR. LISA MOSCONI: Salmon roe.

SHAWN STEVENSON: Roe. Yes. The roe.

DR. LISA MOSCONI: Yeah.

SHAWN STEVENSON: Row, row your boat.

DR. LISA MOSCONI: I didn't know until the book came out then in the states, caviar is really fancy food. In Italy, there is no distinction between the fancy black caviar and just fish eggs. We just use the word caviar for everything. And so, when the book came out, they even have it on the cover. If you see one of my little one, this is caviar, right?

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: It's salmon roe.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: Is my number one brain food. And everybody was like, "But it's too expensive." I was like, "But fish eggs are not really that expensive." And so, I learned that.

SHAWN STEVENSON: I immediately...

DR. LISA MOSCONI: You have to clarify salmon roe or fish eggs.

SHAWN STEVENSON: Yeah. When I heard caviar, I immediately thought of like Scrooge McDuck...

SHAWN STEVENSON: Like super wealthy, great coupon.

DR. LISA MOSCONI: No, it doesn't have to be.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: No. Fish eggs are actually not that expensive. But so, they're the best... So, the nutritional composition of caviar or fish eggs in general is pretty much a perfect complement to the nutritional composition of the brain. It's really a one on one, they're very rich in choline, phosphate lipids, omega-3 fatty acids, a good amount of protein, but they also contain antioxidant vitamins. It contains vitamin A, vitamin C in some amounts, vitamin... Little bit of vitamin E and mostly selenium and selenium is a very rare mineral.

SHAWN STEVENSON: And it's super, super important. Responsible for lots of stuff.

DR. LISA MOSCONI: It is very important because it's a strong antioxidant and is really hard to find in foods like Brazil nuts.

SHAWN STEVENSON: Brazil nuts. Yeah.

DR. LISA MOSCONI: Are a good source, but caviar or fish eggs are an excellent source.

SHAWN STEVENSON: Look at that. Yeah.

DR. LISA MOSCONI: So, I always mention it because, of course nobody eats caviar every day, but once in a while, if it happens...

SHAWN STEVENSON: Add that to your...

DR. LISA MOSCONI: Just so you know it's also really good for your brain.

SHAWN STEVENSON: Yeah. Add that to your superhero utility belt of things to have access to, but it's again, it's just having the awareness.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: And also...

DR. LISA MOSCONI: It's just a curiosity.

SHAWN STEVENSON: Yeah. And the stigmas attached because for...

DR. LISA MOSCONI: It's just not expensive food. There's actually a reason to eat it.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: There's a good reason to eat it.

SHAWN STEVENSON: For me hearing that like immediately in the book, I'm like, "oh, that's fancy." Like it popped up in my mind, but it's a cultural difference.

DR. LISA MOSCONI: It is.

SHAWN STEVENSON: Okay. So, we've got choline, is one, let's talk about tryptophan.

DR. LISA MOSCONI: Let's talk about tryptophan. So, tryptophan is an essential amino acid. So, it comes from protein that the brain uses to make serotonin. A serotonin is a neurotransmitter that is involved in a number of functions like mood, sleep, but also in memory. We don't usually associate serotonin with memory, but actually it has a really strong impact. And the thing about tryptophan is that most people will just say, "Well, it's everywhere." And it's in many, many different foods, but the point is that it comes usually with a lot of other amino acids. They compete with each other to get passage inside the brain. So, the gates are the same, right? And so, tryptophan is usually the one that's left behind. So, I think it's important to focus on foods that contain more tryptophan than the other ones.

SHAWN STEVENSON: Why is tryptophan left behind? Is it slow? Is it...?

DR. LISA MOSCONI: I don't know.

SHAWN STEVENSON: Because...

DR. LISA MOSCONI: I think it's just not as abundant. So, if you have a lot of...

SHAWN STEVENSON: Yeah, that's the thing.

DR. LISA MOSCONI: Like tyrosine and the little bit of tryptophan, you're much more likely to get a lot of the amino acid that is more abundant.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: And that's why you need foods that are particularly rich in tryptophan.

SHAWN STEVENSON: That's super important. So, this essential...

DR. LISA MOSCONI: Especially before bedtime.

SHAWN STEVENSON: Yes.

DR. LISA MOSCONI: Right?

SHAWN STEVENSON: And this is essential amino, so it's used to build serotonin. Which is a precursor for melatonin.

DR. LISA MOSCONI: Also.

SHAWN STEVENSON: All right. But also, there's so much news today about serotonin and like the kind of this happy neurotransmitter and then even antidepressants a lot of them, the SSRIs. So, the most important thing is like, are we even making it.

DR. LISA MOSCONI: Are we making enough.

SHAWN STEVENSON: In the first place, right?

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: And so, this is one of the keys, so tryptophan. But when I hear tryptophan, because just pass and going through life, but I know better today. But I would associate like Thanksgiving turkey. And you wrote about it in the book too, because you're like, "Oh, we eat the turkey, tryptophan, you get sleepy." No, it's because...

DR. LISA MOSCONI: It's because you eat too much...

SHAWN STEVENSON: Yes. You just ate like there's no tomorrow because I've done that. Like this is the last day of my life. I'm going to eat everything. That's how we get on the holiday. Like I'm just going to... And it's an experience. We feast but it's not the tryptophan, by the way.

DR. LISA MOSCONI: Milk is a better source. The whole milk. And I'm sure everybody does. And when you're little, you give warm milk with honey to kids to help them sleep. And that's because there's tryptophan in the whole milk, it's a good source. And if you combine carbohydrates with tryptophan, that actually helps push the tryptophan inside your brain.

SHAWN STEVENSON: And you have lactase.

DR. LISA MOSCONI: That's why you want to...

SHAWN STEVENSON: There. Oh, with the sugar too from the honey.

DR. LISA MOSCONI: With the sugar. Yeah.

SHAWN STEVENSON: Okay.

DR. LISA MOSCONI: The sugar from the honey.

SHAWN STEVENSON: So, but now are we talking about milk from...

DR. LISA MOSCONI: Cow, usually, but goat is actually better.

SHAWN STEVENSON: Okay. And also, is it genetically...?

DR. LISA MOSCONI: Modified? No.

SHAWN STEVENSON: Are we talking about the cows eating, I don't know.

DR. LISA MOSCONI: Corn.

SHAWN STEVENSON: Candy.

DR. LISA MOSCONI: Grains...

SHAWN STEVENSON: Because...

DR. LISA MOSCONI: Usually they're awesome.

SHAWN STEVENSON: True story, there was this big spill that happened. It was like all these red Skittles that coated the freeway, you didn't see this.

DR. LISA MOSCONI: No.

SHAWN STEVENSON: Okay. I mean, this was a while back, but this was going for feed for livestock.

DR. LISA MOSCONI: Really?

SHAWN STEVENSON: Yes.

DR. LISA MOSCONI: Wow.

SHAWN STEVENSON: Nuts, I think this was in Florida.

DR. LISA MOSCONI: Okay.

SHAWN STEVENSON: I got to look this up. We've got to put it in the show notes, so it's not like, "Wait a minute", but some people are going to know what I'm talking about. And it's crazy, like the stuff that you... And I've been pressing this in a culture, now I see it everywhere. I'm not saying that I originated this idea, but you know, you are what you eat ate.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: It's not just you are what you eat...

DR. LISA MOSCONI: No, it's true.

SHAWN STEVENSON: And so, like making sure that we're getting these different animal foods from healthier animals.

DR. LISA MOSCONI: Absolutely.

SHAWN STEVENSON: And of course, you do make that distinction in the book as well.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: So, this is...

DR. LISA MOSCONI: I believe in organic, especially for women, if we can mention that.

SHAWN STEVENSON: Yeah, absolutely.

DR. LISA MOSCONI: So, for women changes in hormonal levels are a natural problem that so many people just don't ever get to talk about. Women, go through a series of endocrine transition stages as we mature through puberty. But then the most shocking one perhaps is menopause. In menopause is the loss of estrogen and progesterone and other hormones that impacts everything inside your body, but also your brain, which we have shown with brain scans how for many women, as they go through menopause, that's when Alzheimer's really begins in their brains.

SHAWN STEVENSON: That's interesting.

DR. LISA MOSCONI: And something to know about women's hormones is that there are many substances that we put into our food that we put in the environment that we put in our skin that are Xenoestrogens. They are foreign estrogens, and they are known to really mess up your own estrogen inside your body. So, they act like estrogens, but they make everything worse. Like if you have a predisposition to breast cancer, they're likely to push you to actually get breast cancer. And this is the society for new endocrinologists who... And they actually put out a warning because we are drowning in plastic. And if you have food that is contained in plastic, and if you heat up the plastic, then all the substances that are known to mess up your estrogens will just leak into your foods and then you will end up eating them...

SHAWN STEVENSON: That's nuts.

DR. LISA MOSCONI: And that really creates issues like, men boobs, or the fact that women... Then girls become women at such a young age. Nowadays...

SHAWN STEVENSON: This is...

DR. LISA MOSCONI: Is not just hormones.

SHAWN STEVENSON: First grade, right?

DR. LISA MOSCONI: It's just...

SHAWN STEVENSON: It's absolutely nuts. And like you just said, so these Xenoestrogens fit into receptor sites and like basically turn on these estrogen driven programs.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: It just all makes sense.

DR. LISA MOSCONI: You said it really well.

SHAWN STEVENSON: And so...

DR. LISA MOSCONI: Thank you.

SHAWN STEVENSON: Well, you know? And so, what's so interesting about it is like you just mentioned these Xenoestrogens maybe from Bisphenol A or something like that from plastics, which is a fossil fuel, right, and so like, this is... Let's not even go down that. When we're talking about organic, and...

DR. LISA MOSCONI: Well but that's why organic is so important, it has no estrogens.

SHAWN STEVENSON: Pesticides, herbicides, rodenticides, many of them are estrogenic.

DR. LISA MOSCONI: Yeah. They're all estrogenic.

SHAWN STEVENSON: Or Neurogenic. Some of them are like...

DR. LISA MOSCONI: Well, estrogen is a brain hormone. We tend to associate hot flashes and night sweats and depression with...

SHAWN STEVENSON: We are not putting it together.

DR. LISA MOSCONI: With your ovaries, but they... These symptoms don't originate in your ovaries. They start inside your brain because estrogen has a strong, strong effect inside the brain.

SHAWN STEVENSON: Wow.

DR. LISA MOSCONI: And food has an effect as well because food also impacts hormonal health in a big way.

SHAWN STEVENSON: Yeah, let's go to, Phenylalanine.

DR. LISA MOSCONI: Phenylalanine, yeah.

SHAWN STEVENSON: Yeah. Let's talk about that.

DR. LISA MOSCONI: Okay. Let's talk about it. So, dopamine, is another neurotransmitter that has a lot of different function in the brain it's really important for movement and coordination, but also for like reward driven behavior and motivation and dopamine is made of a neurotransmitter... An amino acid called Tyrosine. And Tyrosine in turn is made from Phenylalanine. So, you need to make sure you have enough in the diet, but that's easy enough to do. It's not a difference... It's not a difficult source to find it's very abundant in all sorts of animals' foods, and fish. I would say fish, if you need to get good lean protein, fish is a great source. Also, fish is a great source of omega-3, Fatty acids.

SHAWN STEVENSON: So, you get the power pack.

DR. LISA MOSCONI: So, you can get, yeah. And then everybody goes like, how about mercury? Right.

SHAWN STEVENSON: How 'bout it?

DR. LISA MOSCONI: How about it? So, there are... It depends on how big the fish is. Right? So, the bigger it is, the higher, the chances of mercury contamination. So, it's really important to go for fatty fish for the brain, I'm talking about the brain. So fatty fish, especially cold-water fatty fish, which is like salmon, herring, trout, but also the smaller ones, like mackerel, blue fish, sardines, anchovies. And the smaller ones like anchovies and sardines, they're very unlikely to have any mercury. Yes.

SHAWN STEVENSON: Interesting.

DR. LISA MOSCONI: So, the... So, there's...

SHAWN STEVENSON: And your body can actually tolerate some, by the way. It's not like mercury touches you and you disappear.

DR. LISA MOSCONI: No, of course. Well, so how much fish do you eat? I mean, we're talking trace, trace amount of mercury, not the whole vat. There's always something to be said about common sense I think, you can't eat fish every single day just because, it doesn't make sense to do that. And also, you can't eat a pound. A good portion, depending on how tall and how muscular you are, but usually three ounces.

SHAWN STEVENSON: I didn't know you noticed my muscles. So, this is... just kidding. So, phenylalanine is a precursor, tyrosine, and then we get...

DR. LISA MOSCONI: Dopamine.

SHAWN STEVENSON: Dopamine, which is... If we're talking about our drive, we're talking about happiness, we're talking about reward.

DR. LISA MOSCONI: Motivation, playing games.

SHAWN STEVENSON: You need this one. Yeah.

DR. LISA MOSCONI: When you're playing video games, it's dopamine that makes you feel like, "Yeah, give me more."

SHAWN STEVENSON: And you miss out on that without this. Wow. So, by the way, another source, we're going to throw this in here for everybody, it's a perfect place, phenylalanine spirulina.

DR. LISA MOSCONI: Oh the... Yeah, there you go.

SHAWN STEVENSON: Spirulina. You talked about spirulina in your book.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: So, this is a brand-new study, I literally just came across this 2018 study brand new, just came out. This was published in nutritional neuroscience, investigated whether it was possible to treat severe neonatal infection by administering a spirulina enriched diet to the nursing mother. So not even directly to the baby, to the mom. And the researchers stated that severe infection and the associated brain inflammation can cause long term changes to the developing brain due to oxidative stress, even after the original infection has been treated and it's gone. And what they found was, after they compiled the data, a spirulina enriched diet given to lactating mothers, reduced the level of brain inflammation. So, spirulina reduced the levels of brain inflammation and provided an antioxidant defense for the developing neonatal brain. Which, this is the questions that we would ask our incredible guest. How are they actually measuring this stuff? And so, she's actually doing the work, and in the lab, and looking at things like this, and so... By the way guys, spirulina, it's not the best, let's just be honest. It's not like, "Oh my goodness, I cannot wait to eat spirulina today." But it tastes really good in guacamole. I don't know if you've ever had this.

DR. LISA MOSCONI: No, I've never tried it. I will.

SHAWN STEVENSON: Yes. Put a little, but don't go too hard, it changes to a weird color. It's like not from this planet. But it actually tastes really good, it's a good compliment. And it makes

sense. Spirulina is one of the primary kinds of protein sources for like the Aztecs, it's just... Don't get me started. But also, for me, I get this in a formula along with chlorella, moringa and ashwagandha in this product called Organifi. And so, this is the only... And one of the big issues is like, what are they doing to the supplement before they get it to you? Is this actually going to be a whole food kind of extract? Or is it heated, fried, dyed, and this is like... Or a synthetic source of these nutrients. And so, they do a low temperature process, and they actually make it taste good, so this is... I've tried literally, probably 20 different green blends over the years in the last 15 years. Finally, one that tastes amazing, my kids like it, getting their dose of Spirulina and moringa and all that good stuff. And I highly recommend folks check it out, it's organifi.com/model that's O-R-G-A-N-I-F-I.com/model. You get 20% off with organifi. Alright, so head over and check it out. It feels good, it makes you feel clean inside. Alright. So...

DR. LISA MOSCONI: I put it in my energy bars. I make energy bars at home...

SHAWN STEVENSON: You do? You make your own?

DR. LISA MOSCONI: I make my own, I don't trust...

SHAWN STEVENSON: I do that too.

DR. LISA MOSCONI: So yeah, I'll send you the recipe and... That I put spirulina in. So, Lily, my daughter, also likes them very much.

SHAWN STEVENSON: I love that. It... What else you put in these, by the way? Since you're talking about it, what else goes into the...

DR. LISA MOSCONI: So, I have bran, oat bran, flax seeds. I use...

SHAWN STEVENSON: Omega-3s, there's ALA.

DR. LISA MOSCONI: No, no, I don't do supplements.

SHAWN STEVENSON: No Omega... The flax seeds.

DR. LISA MOSCONI: Oh, the flax seeds for omega 3. Yes, it's...

SHAWN STEVENSON: But it's ALA though.

DR. LISA MOSCONI: ALA yes, this is the vegan or the vegetarian plant-based source of omega-3. So, what happens is that the brain has access to ALA, EPA and DHA all three of them, but

needs DHA the most. So, the only natural source of DHA is from fish, and seafood basically. But the brain can use the other two forms and convert them into DHA. The problem with ALA is that over 75% is lost in the conversion. So, when somebody is vegan and says, "Can I take this ALA, the plant-based omega-3 supplements."

SHAWN STEVENSON: And be fine.

DR. LISA MOSCONI: Yes, you can, but you need to take more to achieve the same result because 70% is lost. And one thing to keep in mind is that omega-3 actually interacts badly with specific medications, blood thinners like aspirin. So, it's very dangerous to take these supplements.

SHAWN STEVENSON: Wow, I've got to take that into consideration. Wow and so...

DR. LISA MOSCONI: Yeah, for people over 60 actually, it's a big health hazard.

SHAWN STEVENSON: Yeah. And so, folks that are taking a vegan approach is... Also, the algae oils potentially could be helpful as well.

DR. LISA MOSCONI: Yes, but you need more.

SHAWN STEVENSON: But you need more, yeah.

DR. LISA MOSCONI: Because it's still ALA.

SHAWN STEVENSON: Yeah, still the conversion.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: But just getting more of a concentrated dose. So, these are those areas of whatever... It might be ethics or whatever the case might be, where you got to get into, what am I doing for myself as a human, versus my belief system. And finding that line that you can straddle to make sure that you're still taking care of yourself.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: So last one I'm going to ask you about, again, there's so many things I want to ask you about.

DR. LISA MOSCONI: More.

SHAWN STEVENSON: Is actually really quickly, can we talk about phospholipids?

DR. LISA MOSCONI: Sure. So, phospholipids are actually... That's really the main brain fat. We always think about cholesterol, but the brain contains more phospholipids. And they really are so important, because they keep your brain cell membranes, fluids inflexible which is crucial for the brain to function. And there are many different kinds of phospholipids, there's phosphatidylcholine, there's Phosphatidylserine. So, they are a fatty acid group connected with, either amino acids or vitamins.

SHAWN STEVENSON: Okay.

DR. LISA MOSCONI: Right. And so, phospholipids with choline, which is perhaps the most important, in many ways, has the same origin basically. So, it comes from foods that are very rich in omega-3 fatty acids, but also, sweet peas are really good sources.

SHAWN STEVENSON: Interesting.

DR. LISA MOSCONI: Like crustaceans like crab and yeah. All kind of different fish and shellfish, but also sweet peas. There was another one I wrote it down. Oh, Cucumber.

SHAWN STEVENSON: Cucumber really? Yeah. Surprise, Surprise.

DR. LISA MOSCONI: Yeah. Not as much as fish. Yeah. But they still got some and there's this thing tapioca.

SHAWN STEVENSON: Tapioca yeah.

DR. LISA MOSCONI: So that's a very good source. I don't know I never tried it.

SHAWN STEVENSON: So, it can be, it's great for like baking, you know.

DR. LISA MOSCONI: Like flour.

SHAWN STEVENSON: Yeah, and especially like if you're using alternative flours instead of, you know, the...

DR. LISA MOSCONI: Wheat.

SHAWN STEVENSON: Yeah, bleached, fried, dyed, whatever flour. But you know, like if people are using like coconut flour.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: It can really help to kind of add that missing note.

DR. LISA MOSCONI: It gives more texture. Yeah.

SHAWN STEVENSON: So, last one I want to ask you about which wasn't the phospholipids, the Omega3s. So, let's circle back to the omega 3s. And talk about, but you've mentioned it several times, but let's pin down the best sources because it's essential.

DR. LISA MOSCONI: Right. So, the best sources, it depends if we're interested in animal sources or plant sources, what do we start with, animals? Because they're better...

SHAWN STEVENSON: Both.

DR. LISA MOSCONI: Right. So, fish, well caviar is my number one or salmon roe or fish eggs are really the most, the highest sources on the planet. Salmon is good, but not nearly as rich, frankly, herring, mackerel, sardines and anchovies, trout, fatty fish.

SHAWN STEVENSON: Got it. And then for the vegetarian side, we got chia.

DR. LISA MOSCONI: For the plant side is flax seeds. Chia. Yes. But flax seeds are better flax seeds and hemp.

SHAWN STEVENSON: And hemp seed, yeah. Big fan.

DR. LISA MOSCONI: It's big in California.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: Chia seeds, walnuts, soybeans. Yeah. And then oats... Spirulina that's what I was trying. Yeah. It's actually a good source of Omega 3s.

SHAWN STEVENSON: Alright, I hope that you are enjoying this information so far. And in this next conversation, you're going to be learning about some remarkable distinctions between men's and women's brains and important biases to be aware of in healthcare overall, plus many more brain boosting nutrition and lifestyle tips. Here's more from Dr. Lisa Mosconi.

DR. LISA MOSCONI: Did you know about how women have been excluded from research?

SHAWN STEVENSON: No.

DR. LISA MOSCONI: So many people don't...

SHAWN STEVENSON: That's the thing.

DR. LISA MOSCONI: And I would say most people don't, don't know that, so many scientists don't know either.

SHAWN STEVENSON: I never thought of all the thousands of studies I've read. Yeah. I've never thought about that distinction. And you mentioned it very clearly that the medical system has kind of uniformly excluded women. And basically, treating women as just smaller men when we're talking about the medical data. Can you talk about that a little bit?

DR. LISA MOSCONI: Yes. So, the first part of the book is really, a description of how women have been systematically excluded from medical research, which is not to say as a conspiracy against women, but it's just something that happened as a result of a number of biases, if you will. And so, I use this term, bikini medicine, which is an unfortunate term if you will, but it's quite to the point, describing how historically most medical professionals really actually believed that men and women were essentially the same person just with different reproductive organs. So sudden those parts of the body assigned as if one could mean that most professionals, most doctors would diagnose and treat both sexes the same exact way. And basically, there's a whole worldview that got derived from that model, which makes women's health, the field biased to start with. Because if you go to a doctor and say, can you look at this female patient through the lenses of women's health, they're going to do a pap test.

DR. LISA MOSCONI: To check your cervix for cancer.

SHAWN STEVENSON: Standard.

DR. LISA MOSCONI: They're going to do a mammogram if you're over 42 or 40, depending on the doctor, they might do a blood test to check your sex hormones for fertility or menopause and whatnot. But again, women's health is confined to the health of our reproductive organs. And that's really a direct consequence of a very reductive understanding of what a woman is to start with. Because clearly women are not the same as smaller men, with different reproductive organs. We're somewhat different systems and it's not in any way to exaggerate the differences. So, it is not like women have some parts that men don't have... Well, except

for the reproductive organs. Right. But when we're thinking about, for example, women's brains, which is really the focus of my research anatomically, we're basically the same, but the functionality of the brain is different. And there are so many things that can happen in the brain that happen more to women than to men or only to women and not to men and only to men and not to women.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: Right. But we understand men's risk factors a lot better than we understand what can happen to women. So that's really why I'm doing this.

SHAWN STEVENSON: Yeah. And it's so important because as you outlined, the first thing I want to make clear, which you alluded to already is that it's not like some conspiracy, but there was some early reasons why this kind of evolved into this, which is women's bodies tend to create some curve balls when doing clinical trials like pregnancy.

DR. LISA MOSCONI: Getting Pregnant was a big one. So, what happened was that there was a drug thalidomide. It was given to women, including pregnant women to deal with symptoms like nausea. And then it turned out that the drug actually had a terrible impact on the baby. And many babies were born with deformities or with severe medical issues. And so, the drug was reevaluated and was banned in the United States. But at the same time, the FDA really took a cautionary stance and decided to exclude women of childbearing age from experimental clinical trials where you still don't quite know the side effects as well as you should. Right. But then...

SHAWN STEVENSON: That's excluding a lot of people.

DR. LISA MOSCONI: But that's excluding a lot of women because there's any woman from puberty through menopause. So, what happened then is just... I think it was really out of concerns for the babies and the women to some extent that the new mothers, that women were just excluded from all clinical trials, not the phase one clinical trials, but just from all medical research and by doing that, women were no longer participating in research, but they were also no longer informing research. And it is true that our bodies are more cyclical in nature than a men's body. And if you are a scientist, you have to deal with that but that's not that hard to do right to be honest and instead, a decision was made to just focus more on men, assuming that especially when it came to heart, lungs and brain, that would also, whatever results investigators found would also apply to women. And that turned out to be not the case you know, in a big way.

SHAWN STEVENSON: And even when women are included and again, just thanks to your data and me learning this.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: It tends to be everybody's lumped together.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: All the data's lumped together is not giving a distinction between this is something for women's health specifically.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: This is something for men's health. And with that said, we parlay into this discussion of the female brain and how different it is under these different measures, whether it's like some kind of a nutritive intervention or medical intervention.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: It's going to impact women's brains differently. So, I want to talk about the difference.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: With the female brain, because it is fascinating.

DR. LISA MOSCONI: The anatomy is not quite different. Like if you look at brain scans and you don't know the gender or the person that you're taking a picture of, there's no way of telling this brain belongs to a woman. This other brain belongs to a man. Other than on average women's brains are slightly smaller because we are just smaller on average than men. But once you adjust for head size, pretty much volumetrically speaking, there are no strong gender differences. The differences that matter most are in the functionality of the brain and the biochemistry of the brain and I've been looking into that for a really long time because of personal reasons. I have a family history of Alzheimer's disease that affects the women in my family quite a lot. So, my grandma, my grandmother was one of four siblings and there were three sisters and one brother, and all three sisters got dementia and died of dementia, whereas the brother was spared.

And that was quite shocking also because I'm from Italy. As you know, I'm from Florence in Italy and especially back then, there was no assisted living. So, your grandparents live with you period. And then the family, you know, especially my mom became the primary caregiver for my grandmother. And then my aunt started taking care of the other sisters who got dementia, everybody... I mean, it was like a 10 year process and it was very painful as anyone can imagine. And that really led me to think about Alzheimer's disease as a connection with sex and gender, which was really not a topical conversation back then...

SHAWN STEVENSON: At all...

DR. LISA MOSCONI: And I've been doing this for almost 20 years, so really, you know, and I've seen the field just change so much. And something that many people are not aware of is that women's brains have very specific risks that we usually underestimate and kind of put down to, you know, perhaps you're having a bad day or maybe your PMS, but in reality, women are twice as likely as men to have anxiety and depression, we're three times more likely to have an autoimmune disorder, including those that attack the brain like multiple sclerosis. We're four times more likely to have headaches and migraines as any men knows. We're more likely to even get meningiomas, which are the most common form of brain tumors, especially in, during menopause. And we're far more likely to die of a stroke. And on top of all that Alzheimer's disease, which is the most common form of dementia on the planet affects more women than men. So, of every three Alzheimer's patients, two are women, which means that for every man suffering from Alzheimer's disease, there are two women and that's an enormous amount of women. In the United States alone, Alzheimer's disease affects almost 6 million people. And if we don't find solutions by the year 2050 it's going to grow to like 15 million, which is like for context is the populations of New York, Chicago, and Los Angeles put together. So, it's a huge amount of people. And two thirds of all those people might be women.

So, we have some problems here and it's important to find solutions. So, this is really what I was trying to do with the book, not just this super depressing It's not a downer. I promise it's really about acknowledging the problem, explaining how we got ourselves in this situation and what we can do to really reverse this problem and optimize cognitive health and brain health in women. These are the scans I wanted to share.

SHAWN STEVENSON: There are some wonderful brain imaging scans in the book as well, just to kind of highlight some of these things we look at pre-menopause, post-menopause, the brain really does change.

DR. LISA MOSCONI: It does change.

SHAWN STEVENSON: But one of those physical aspects, just to pivot back a little bit and it just of course, made so much sense when you talked about it, that one of the physical, it'd still be difficult to see if you don't have a trained eye looking for it. But I guess the hemispheres of the brain for women, it's more what's the right word for it?

DR. LISA MOSCONI: Interconnected.

SHAWN STEVENSON: Interconnected.

DR. LISA MOSCONI: Yes. Well, I think the technical word is structural connectivity. Yes, and so what happens just taking a step back just a quick one is that women are born with two X chromosomes, and men are born with an X and the Y, and those genetic differences do matter also in terms of brain development. And I think it's important to clarify that because most people think of this XX and XY is only involved in reproduction, but in reality, there are many genes in these chromosomes that are directly involved in brain function. And something that is a curious fact, is that the X chromosome, which women have two of, are much bigger than the Y chromosome. So, each one has 1,098 genes. Whereas the Y chromosome has only 78. Yes. And many of these extra 1000 chromosomes, that women carry are really involved in brain function. So, there's something there that starts immediately at the time of conception because this cell that is born with the XX is going to develop and mature migrate differently than the other cell that is born with an XY.

And one of the big differences is the type and quality of the hormones that are going to be produced in those brains. So, the XY chromosome dictates that, that baby is going to start making androgens like testosterone, which are male hormones. So, the brain, because these chromosomes are also part of our brains and they're involved in brain function. So, the brain is also really going to be wired to respond more to the androgens and testosterone, because boys have very little estrogens. For girls is exactly the opposite. We make a fraction of the amount of androgens, and we make a thousand times more estrogens, this is figure of speech, but our brains are really wired to respond to the estrogens. And the way that works is that we have little receptors in many parts of the brain that are specific to that type of hormones. So, our brain tissue is populated by estrogen receptors that specifically bind to estrogens. It's like a key in the lock and when the binding happens, then there's a lot of things that happen in the neurons downstream, especially energy production.

So, hormones, estrogens in particular, in the female brain are really strongly involved in energy levels in the brain. And so, what happens as these baby brains age and go through puberty and then through a number of different phases of life is that at some point, we reach midlife and that's when things start going downhill for women, at least temporarily, because testosterone doesn't run out until late in life. Most men don't lose their hormones until they're in their

seventies or eighties. Of course, there's a little bit of a change, but it's not nearly as dramatic as what happens to women in menopause and perimenopause, where we basically lose our hormones, like boom, it just literally peaks down. And that has an effect on the brain, which we have demonstrated using brain scans perhaps for the first time, as far as I know. So that was quite shocking. Is that image in the book that you mentioned.

SHAWN STEVENSON: Yeah. This was like... Because I think the issue is that we label these as sex hormones and it's kind of the end of the story, but understanding there's so many more receptors, there's a lot more activity going on the brain... In the brain for women as far as estrogen and all the influences that this has. And so that starts to open up the case for when you shift away from having this estrogen production and then we see paralleled all of these issues with cognitive decline Alzheimer's that are so much higher in women. And we're not talking about this, we're not having this conversation. So, estrogen it's so much more than just a sex hormone.

DR. LISA MOSCONI: It's much more. Thank you. Yes. So, hormones like estrogen are not only involved in reproduction, but also very closely in brain function and estradiol in particular, which is the most potent form of estrogen is really key for energy production in the brain, as well as growth, plasticity and immunity. So, what happens is that when your estradiol is high, as a woman, your brain energy is really high, but when your estrogens go down during menopause and perimenopause prior to that, then your brain energy also goes down, your neurons slow down, and they start aging faster. And studies have shown that this process could even in some women, not all women, of course, but in some women that is correlated with the formation of Alzheimer's plaques with amyloid plaques. And we have shown that using brain scans that's really true. If a woman is predisposed to Alzheimer's disease that shows up during menopause, which is 50, is not age 70 or 80 is 50 years old or earlier. I was just reading that 10% of menopausal women go through menopause before age 45. It's incredible. Yeah.

SHAWN STEVENSON: Wow. So, with that said some of the... So, you mentioned that estradiol...

DR. LISA MOSCONI: Estradiol.

SHAWN STEVENSON: So, there are different forms of estrogen, which I think is important to mention. It's not just one thing, there's estrone and...

DR. LISA MOSCONI: Yes, and estriol.

SHAWN STEVENSON: Estriol. And so, when we're looking at... Which we'll get to, hormone replacement or whatever the case, we have to be mindful what kind of estrogen...

DR. LISA MOSCONI: We're replacing the estradiol. That is the one that your body no longer makes after menopause and the estrone is the backup, whereas the other, the third hormone, you only make it when you're pregnant.

SHAWN STEVENSON: So, we got the...

DR. LISA MOSCONI: And it makes you feel great, but only for a few months, and then you're on your own.

SHAWN STEVENSON: So, we got people's estrogens coming off the bench when they need to, but it's such a bigger conversation. And so, let's talk about some of the impacts that estrogen has on the brain. So, you mentioned preventative, like when it's around, there's less of an incidence of potentially the amyloid plaque formation.

DR. LISA MOSCONI: Yes. Yes.

SHAWN STEVENSON: But what are some of the things that estrogen does for the brain? What benefits does that do for a woman's brain?

DR. LISA MOSCONI: Well, many, many benefits. We refer to estrogen and specifically estradiol as a master regulator in the female brain, because it's really involved in a number of functions that you wouldn't even imagine because we never talk about it. But really energy is the most important thing. And I know you love biology, so I'm going to go into it.

SHAWN STEVENSON: Let's do it, yeah.

DR. LISA MOSCONI: But by energy I mean, the cerebral metabolic rate of glucose. So, estrogen is something that activates neurons to burn glucose more efficiently. And glucose is the main energy substrate for neurons especially. So over 90% of the synapses are glutamatergic and they really need glucose to fire. And the estrogen literally helps glucose enter the Krebs Cycle and be shuttled into the mitochondria, which are the energy factory of the body and the brain. So that's really important because that's the way that your brain produces the most ATP. And I know there's a lot being said about ketone bodies, but with the research, if anyone is thinking, well, then I should go on a keto diet, what the research has shown is that as you go through menopause, what you really want to do is to treat the root cause of this. So, you want to have the hormones that allow your brain to burn the glucose, because if you do not, what happens is that ketones are just not enough. And research has shown that. And at some point, your brain just gets really confused and starts burning its own fat. And that the...

SHAWN STEVENSON: The structural fats?

DR. LISA MOSCONI: Yes, the structural fat in the brain.

SHAWN STEVENSON: That's so dangerous.

DR. LISA MOSCONI: And that's why we find white matter reductions on brain scans. It's called catabolism, is when... It's not a good thing. Let's just say that. So that's one reason that having enough of this hormone is really important to keep the brain structurally solid and sound, but also to really support the functionality of neurons and just the health and integrity of your membranes.

SHAWN STEVENSON: Yeah. This is so... Again, super enlightening and...

DR. LISA MOSCONI: I'm so glad I get to talk about these things, I'm usually more like, yeah, I know neurons burn sugar.

SHAWN STEVENSON: Well, we love to geek out. And I love the fact that in the book you said this, and this is a direct quote, you said, "Alzheimer's, isn't like you suddenly caught a cold. Rather the disease is a result of a number of genetic medical and lifestyle events that have been happening along the way. Because what we tend to think is that this just happened."

DR. LISA MOSCONI: Yes. So, one day you go to the doctor and boom, you have a diagnosis.

SHAWN STEVENSON: Yeah. And if we're talking about the story of estrogen, it's a kind of a, it's a longer history, than "oh, my estrogen is turned off" or whatever the case might be. This is something that with our lifestyle and with our focus on our brain health is going to determine what estrogen is doing pre-menopause, during and after.

DR. LISA MOSCONI: After.

SHAWN STEVENSON: Yeah, so...

DR. LISA MOSCONI: Yeah, for sure. And it's important to talk about this because that's quite an insight to associate menopause with Alzheimer's disease. Most people think of Alzheimer's as old age and menopause as middle age. But in reality, we know now that Alzheimer's disease starts with negative changes in the brain years, if not decades, before clinical symptoms emerge, which is like in the '70s. So, the real onset of Alzheimer's is more in midlife, especially for women. And it seems to really overlap with the transition to menopause. And I want to add this and then I'm going to stop the bad news, but for most women, menopause is around age 52 in the United States, 52, 53, but it can be much earlier sometimes because of genetics,

sometimes lifestyle, but very often because of medical interventions. And I would like to mention this because common examples are a hysterectomy and/or an oophorectomy, which is the surgical removal of the uterus and/or the ovaries. One in every nine American women has this procedure done in the course of their lifetime, very often before menopause when they're young in their '40s. And we unfortunately know that having the uterus and more, so the ovaries removed prior to menopause correlates with a higher risk of future dementia in women. So, this is something that I realize is depressing news, and it's very upsetting news, but we also really we need to talk about it because so many women are not aware.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: And it is important information to have, because sometimes you get your uterus taken out because of fibroids. It's the most common cause of surgery. But we know from other work that very often fibroids respond to medical and lifestyle treatments. So, there's... It's something that is worth looking into before your doctor even suggests the surgery.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: So, I just want to put it out there. It's one more reason to...

SHAWN STEVENSON: Yeah. This is super important.

DR. LISA MOSCONI: Really consider reproductive organs, not as something that you can just get rid of quickly.

SHAWN STEVENSON: Right, right. Because this really goes back to this being a male focused field.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: And just like, "Well, you're not going to need those anymore." And I've seen this many times, it's actually one of the catalysts for me getting into this space and moving outside of fitness and focusing more on nutrition and health, is because of a patient I worked with who had fibroid tumors.

DR. LISA MOSCONI: Fibroid tumors.

SHAWN STEVENSON: And we were able... And we did it... By the way, we did it, it was a while back, we did an episode on fibroids. So put that in the show notes. But we were able... She had

fibroids the size of like, about oranges and they were able to dissolve the size of raisins within a month's time. But this is... The result's not typical. Let me just be clear about...

DR. LISA MOSCONI: No, but it can happen. And if... Even if they don't dissolve in a month, you can still make it better. You can manage the symptoms, often, not always, not always.

SHAWN STEVENSON: Right. Well, you have to be...

DR. LISA MOSCONI: But if you can, I think it's really worth looking into that. And this is even more of a good reason to.

SHAWN STEVENSON: Just need to be more judicious in owning, like these are your organs and let's look... Let's take some time and kind of go through and look at all of our options before we have something taken out, is the biggest take home. And again, I think it's important to get self-educated, which is... A book like this. This is mandatory reading for any woman. And also, if you love women, you should check it out too. But the female brain, the XX brain is... Like it gives you... This is like a guide to understanding your body.

DR. LISA MOSCONI: It was meant to be... Yes, it was meant to be a woman's guide to maximizing brain health and preventing Alzheimer's Disease. That was my idea for the subtitle and then that got kind of overruled. But I really wanted to write it as something that is very practical. So yes, there's... It's divided into three different parts. The first part is really the research, which I think is very motivating to really understand how your brain works and what hasn't been done, and what needs to be done. But what we know so far is quite powerful already. Is just that it's not common knowledge. It's just not common knowledge. If you go to an OB-GYN or a surgeon who's going to take out your ovaries, there's a good chance that they might not know that that's going to have an effect on your brain. So, I think there's a whole education...

SHAWN STEVENSON: They're not thinking about it.

DR. LISA MOSCONI: Thing that is kind of missing in medicine. I think we should be doing a much better job of really communicating with each other and sharing data...

SHAWN STEVENSON: Absolutely.

DR. LISA MOSCONI: And then providing information to the patients, really comprehensive information. Which is not to say the doctors don't want to do that.

SHAWN STEVENSON: Yeah, of course.

DR. LISA MOSCONI: It's just something that needs to happen, and we're moving in that direction. But I think it's also important for women to know that, and demand information, and really understand their brains better. And then take part two, which is a lot of tests, and it really helps you figure out if there's anything that you should be concerned about. What kind of risk factors are really important for you and not the average statistical woman or person? And then in part three, which is the longest part of the book, is really everything we know from science. No internet, no personal opinions, it's really science-based evidence and actionable research that every woman can really engage in today, including a lot of information on hormones. Yeah.

SHAWN STEVENSON: 'Cause you talk about that we have a chronological age, we have a hormonal age.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: And so, this is really a big key as we move into this new model...

DR. LISA MOSCONI: Yes, you're right.

SHAWN STEVENSON: Of women's health and just health overall for anybody, is understanding we have a hormonal age.

DR. LISA MOSCONI: Yes. I think it's more of a thing for women, for the reasons we just discussed, that all of a sudden, you're aging really fast. As you hit menopause your clock, your biological clock and your hormonal clocks are kind of not in sync anymore. And so, I think especially midlife as women approach perimenopause, which is any woman of age 45 and older, sometimes younger, but it's pretty much every woman. Something is happening to your brain that really deserves your attention, your full attention, and your support. And I think that's a nice thing that we can do for ourselves to really feel connected to our brains and acknowledge the fact that your brain is not just going to get better on its own. And there are a lot of things that you can do to protect it, to support it, to nourish it. Especially midlife when women's brains seem to be more sensitive to hormonal aging than just straight up chronological aging. Which is not putting women down, it's not a condescending thing to say, it's exactly the opposite. We just... We have these hormones, it's not sexist to say that they matter for your brain, which is not to endorse any stereotypes.

That women have the chocolate love or the shopping thing. But it's really about understanding that these hormones matter and that we need to just protect them the same way that we think about health for many other things.

SHAWN STEVENSON: Yeah. And I love the fact that you talk about why... Just that question, "Why do women have to go through this at all?" And just kind of like... It seems like a philosophical question, but you mentioned that there's only two species that are able to continue living after their fertility is over. And it was what, whales and women?

DR. LISA MOSCONI: Women and killer Whales.

SHAWN STEVENSON: And killer whales, not just the regular.

DR. LISA MOSCONI: Not just regular whales, killer whales. There's another type of whale as well that I just learned about, but I think they're rare. But killer whales are quite interesting.

SHAWN STEVENSON: So fascinating. And do you have a... And this is the thing, it's like we try to piece together why, why would that be? And you had a great example of how even killer whales, how their social dynamic is. So, let's talk about that.

DR. LISA MOSCONI: They live in matriarchal societies, so the kids stay with the mom for a long time, which is kind of parallel to ancient humans, where the men used to go hunting and would be gone for a long time understandably and women will stay back and take care of the kids and the elderly.

SHAWN STEVENSON: And the men might not come back too.

DR. LISA MOSCONI: And they may not come back too. That's true. So, there is this theory, which I think is really cute, it's called the grandmother hypothesis that says that at some point mother nature thought, well, I don't want these women to die when they're no longer fertile. I want them to stay with their daughters and become grandmothers and really help. But in order to avoid a reproductive conflict, I'm just going to make them infertile so they can stay on. They can help out, but they're not going to have kids anymore because we need the younger generations to have kids because that's much more powerful. The kids are going to be stronger and healthier and what not. So that's...

SHAWN STEVENSON: Yeah, fascinating.

DR. LISA MOSCONI: That's what people think. And I think mother nature could have made it a little bit better. Right? The transition could have been smoother. But yeah.

SHAWN STEVENSON: Oh, man, I love it. So is that the grand... What is it called? The grandmother hypothesis?

DR. LISA MOSCONI: The grandmother hypothesis.

SHAWN STEVENSON: The Grammy hypothesis. Got it. Alright. So now that we've established that this is not, this isn't a sexist issue. This is a fact.

DR. LISA MOSCONI: No. It's a fact. Yes.

SHAWN STEVENSON: And Menopause is something that is just a normal process.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: And...

DR. LISA MOSCONI: It's a taboo still.

SHAWN STEVENSON: Taboo, right.

DR. LISA MOSCONI: In the society and that We should really break pretty fast.

SHAWN STEVENSON: Yeah. And it's ridiculous. So, if we can let's first just give a brief summation of, we know we... What tends to happen and what we see in the media or even movies is like, you know, the hot flashes.

DR. LISA MOSCONI: Right.

SHAWN STEVENSON: We see the unstable emotions.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: Like what's going on. When menopause, when the process actually takes place, why are, why do women experience these symptoms?

DR. LISA MOSCONI: Right. And that's really a good point in there. And I was so surprised to learn that that is not common knowledge at all. So, I think it's really good that we get a chance to talk about it. And it really goes back to what we were saying before that the female brain is wired to respond to estrogen. And all these little estrogen receptors are located in very specific brain regions. They are particularly abundant, for example, in the hypothalamus, which is the brain region in charge of regulating body temperature. So, if estrogen doesn't activate the hypothalamus correctly, then the brain is not able to regulate body temperature correctly, these hot flashes that women get, that is the hypothalamus. It's just that the estrogen is going

up and down. It's all over the place. And the hypothalamus gets confused and can't keep your body temperature a constant, or is the brain stem, which is in charge of sleep and wake.

So, if estrogen doesn't activate the brain stem correctly, we wake up at night or we have trouble sleeping. And then there's the amygdala, which is the emotional center of the brain, which is right next to the hippocampus, the memory center of the brain. So, when estrogen levels ebb in these regions, some women get mood swings. Some women get depression. Some women have memory lapses, all those symptoms. When women say we're having hot flashes, night sweats, insomnia, depression, anxiety, brain fog is a big one, memory lapses, those symptoms don't start in the ovaries. They start in the brain in those very specific regions of the brain that are adjusting to the fact that your estrogens are all over the place.

SHAWN STEVENSON: Yeah. This is fascinating because, you know, with the hypothalamus, like there's so many questions that are being answered in my mind right now.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: And it's kind of considered this master gland.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: And it's like an interface, like your endocrine system, your nervous system.

DR. LISA MOSCONI: Right.

SHAWN STEVENSON: But, so of course...

DR. LISA MOSCONI: It's also the region that regulates the production of estrogen and progesterone, right? So, if it's not being activated correctly.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: So, it basically becomes looped.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: That it is not as efficient as it was.

SHAWN STEVENSON: And being that its regulating temperature makes complete sense. But also, it's a assistive regulator in your body's use of calories.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: So, we see the fluctuation with weight.

DR. LISA MOSCONI: Absolutely.

SHAWN STEVENSON: Oh, my god.

DR. LISA MOSCONI: So many women put on weight after menopause. It really starts in your brain.

SHAWN STEVENSON: Why do you like making everything make sense now? You know? Oh my gosh.

DR. LISA MOSCONI: Because as a woman, I really wanted to know.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: And I was surprised that I didn't know that nobody would tell me, my mom didn't tell me a word about menopause. I asked her because for many women knowing what happened to their mom is a good indication of what's going to happen to you, right? So, I was like, mom, how did you make, how was it for you? And she's like, I had some trouble sleeping, but broadly okay. So, I was like, I said okay. And so, I just hope for me as well, but the important thing is then yes, there's a genetic component, but then your lifestyle plays a huge role. For example, personal example, my mom never smoked. And she went through menopause at 53, which is on the later side. I smoked in high school being Italian, not nearly as much as my friends used to but I probably smoked enough to actually create a problem for my ovaries because smoking is the number one cause of early menopause.

SHAWN STEVENSON: Mm.

DR. LISA MOSCONI: Yes. So, it's even more of a good reason not to smoke cigarettes, especially for girls.

SHAWN STEVENSON: Poor ovaries, no.

DR. LISA MOSCONI: Poor Ovaries, yeah. It's a toxin.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: It's a very specific ovarian toxin.

SHAWN STEVENSON: So that, again, that I think that the highlights of important category of toxin exposure.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: Can affect this process. So very grateful for that. Now...

DR. LISA MOSCONI: Thank you.

SHAWN STEVENSON: When we think about the transition through menopause, what tends to come up in the... Just public consciousness is hormone therapy.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: So, I want to talk a little bit about that before we talk about some of the like real brick and mortar solutions. So, what do you think first of all, bio-identical hormones? What do you think about this?

DR. LISA MOSCONI: You live in California. It's such a big deal in California.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: Well, the hormones are complicated and there's a lot of confusion on whether or not one formulation is safer than the other. And one dosage is better than a compounded dose and... I think we need much better data and more research to really answer all these very important questions. What we know for sure about hormones is what we should not be doing. I think that's the major lesson that we got... That we learned from clinical trials. And especially just what happened historically, is that in the 1950s the first hormonal formulation became available, and it was met with such incredible joy and expectations that every woman in menopause was put on hormones, very high doses of hormones, and basically left on hormones for life. And that was before the NIH, the National Institute of Health even had a chance to run clinical trials, to really look at safety and side effects and efficacy. So, in 1993, the NIH launched the Women's Health Initiative, which was an enormous clinical trial, where tens of thousands of women who were randomized to take either hormones or placebo for years.

And the idea was that taking the hormones that the body was no longer making, would really help reduce all these things that we talked about, like the symptoms of menopause. Not just the hot flashes, which were a big concern of course, but especially the trials looked at risk of heart disease and stroke and blood clots and also dementia. And what happened is that they were very abruptly stopped in 2002, 2003, because very early data showed that the therapy was doing exactly the opposite, of what it was supposed to be doing. So, there was much higher incidents of heart attacks and strokes and cardiac events for women taking the estrogens and a progestin, which is a synthetic form of progesterone. There was also higher risk of cancer. And for those women, there was also twice the chance of developing dementia.

SHAWN STEVENSON: Oh my gosh.

DR. LISA MOSCONI: So, it was an absolute disaster, the trials were stopped. The news really picked on that and really broadcasted this data in a very frightening way. And so, it just... So many women just stopped therapy, basically cold turkey, and there were so many lawsuits. And basically, research development kind of stopped at that point. And I think it's been really hard to get back up to speed since then. Just recently, we have some new clinical trials, that are much better versions of that trial in that, the Women's Health Initiative had some issues to start with, especially that the women in the trial, both trials, were too old to start with. They were pretty much over 65. If you go through menopause at 50-ish and you... Your system shuts down, the receptors are just going to shut down, because there's no estrogen activating them. And so, the whole... Your brain, your body, just resets and moves forward. But if you then reintroduce the hormones when the system is not ready to receive them, you're not going to get a benefit. You may get a bunch of side effects, which is what happened, especially for the vascular system, which seemed to be the major issue.

And then just recently, I'm going to make it really short. But now we have some clinical trials in younger women. And it turns out that if you... Especially for your brain, if you take hormones within six years of menopause, that it's not harmful. It doesn't seem to be a particular beneficial yet, but there's hope, and then of course, we need to test different formulations and different dosages and different timelines. And what many of us really believe is that you need to probe the system. You need to see, are your receptors active? Is your system ready to take these hormones? When is the best time to start? When is the best time to stop? And how much of these hormones do you need as a woman? Because there's no average dose, every woman makes a different quantity of hormones in different qualities. So, you really... Therapy really needs to be individualized.

SHAWN STEVENSON: Yeah.

DR. LISA MOSCONI: And I want to... Because I get this question all the time...

SHAWN STEVENSON: Sure.

DR. LISA MOSCONI: Should I take this hormone? Should I be on hormones? And so, what I did is of course described this in detail. But then I came up with flow charts. Being a scientist. So, this is obviously not to replace your doctor.

SHAWN STEVENSON: Which is in the book, the flow charts.

DR. LISA MOSCONI: Yeah, the flow charts are in the book. And I think you can just start and say, "Okay, do you have hot flashes? Yes. No." "Do you have low sex drive? Yes. No." "Do you have blah, blah, blah? Yes. No." And then it gives you options. "Are you eligible for hormonal therapy? "Many women are not, some women are. And if you are eligible, then you go to the next thing, the next figure, and decide whether or not there are risks associated with that based on your age, your cardiovascular risk score, or on your cancer risk score. So, there is no universal answer. It's not like you're a woman, so...

SHAWN STEVENSON: Yeah. Here you go.

DR. LISA MOSCONI: You do this. There are a number of parameters that we need to take into account, and I explained them in the book.

SHAWN STEVENSON: Yeah. So important.

DR. LISA MOSCONI: So, it's a good start.

SHAWN STEVENSON: Yeah, it's just... It's creating a broader... I think our tendency is towards just, again, one lane or one-track thinking, just because of the way that our system is structured. And they were giving out estrogen like hot cakes in the 1950s, and now you know the conversation has shifted. And with that said, with its opening up, a lot of people are aware of the genetic component to conditions like Alzheimer's, and so there's a lot of various genetic testing available, and this is a topic you address in the book because...

DR. LISA MOSCONI: Yes. Because it drives me nuts.

SHAWN STEVENSON: Taking it upon ourselves to do the direct-to-consumer test, which this bothered me for a long time.

DR. LISA MOSCONI: It does.

SHAWN STEVENSON: This is why people are wondering, why don't I talk about it very frequently on the show, is because I saw some bad decisions. People are just at cocktail parties, they're talking, and it was like, "Oh yeah, you can get your genes tested and whatever. And you can get your... " Ovaries removed or whatever based off of these tests that come in the mail. Now, with that said, here, I got to share this. This is a quote from the book.

DR. LISA MOSCONI: Okay.

SHAWN STEVENSON: You state, that the problem with many direct-to-consumer genetic tests, you said that the tests might only be slightly more accurate than horoscopes.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: All right. Now, let me... With that said. Let me tell you my...

DR. LISA MOSCONI: In some cases.

SHAWN STEVENSON: Horoscope today. So, I went and looked it up. Okay. And this is my true horoscope today, which I don't know anything about horoscopes. But this is what my horoscope said, "Enjoy lighthearted socializing among friends and colleagues striking a good balance between one-on-one contact and group activities."

DR. LISA MOSCONI: How is that even horoscope? This is like a fortune cookie.

SHAWN STEVENSON: Is so general, but guess what we're doing right now? One on one. Okay. Come on.

DR. LISA MOSCONI: For two introverts this is good.

SHAWN STEVENSON: Somebody is like... Somebody who is about that horoscope life, they're like, "See, I told you." But yeah, so that's the thing. There's a lot of guesswork...

DR. LISA MOSCONI: No, that's the problem. Yeah.

SHAWN STEVENSON: Involved.

DR. LISA MOSCONI: Yeah, yeah. Well, I think as a scientist, and as a person who is responsible for a lot of patients, I want to know what the test-retest reliability is for any test. So, if you're being tested today, and tomorrow, and in a month, I need to have the same result. And we

have CLIA-certified labs with known test-retest reliability, which is never perfect by the way, there's always a margin of error. But usually, it's quite low and is known for the tests. But most tDCS tests do not even share that information. I looked at a few because our patients would come to us and say I have this APOE genotype and I'm terrified is the bad Alzheimer's gene and I was like, "How did you even get it done?" They are like, "Oh, I did, like 23andMe, for example. And very often we repeat the test, actually, we always repeat the test if they're our patients, and very often they don't match. But we use a CLIA-certified lab. So, I'm much more confident that the results we get are the right ones. There was this study published in Nature showing how even the BRCA Gene gets really misdiagnosed with these tests.

SHAWN STEVENSON: This the breast cancer?

DR. LISA MOSCONI: Yeah, that's the breast cancer gene, the BRCA1 or 2. And if you don't go to a specialist to have it confirmed, and it turns out, you don't have the genetic mutation, women can really make a decision to have their breasts removed or their uterus removed and then find out "Oh, actually, perhaps... Although any reasonable doctor would repeat the test. But it was incredible how inaccurate these tools are.

SHAWN STEVENSON: Yeah. And even the APOE gene A-P-O-E gene, by the way, which is largely, but not appropriately linked to Alzheimer's, because I think you shared there is maybe like 60% of...

DR. LISA MOSCONI: Alzheimer's patients who do not have it.

SHAWN STEVENSON: Alzheimer's, patients don't even have it. Don't even have that gene.

DR. LISA MOSCONI: Absolutely. Absolutely.

SHAWN STEVENSON: And it creates so much fear. And this is what I want to highlight is that you mentioned that basically, receiving genetic information without counseling is dangerous.

DR. LISA MOSCONI: It is very dangerous, receiving any medical information or clinical information without guidance, I think is potentially a problem. Because what do you do with the information? With some tests, like if your cholesterol is high at this point, most likely than not, you know what you're supposed to be doing. You watch your diet, you exercise, and other parameters, you ask if your parents did, they have high cholesterol is it genetic or not? But then there are all these new tests for which the test is only as good as the doctor who's going to manage your response to the knowledge of the test, and who's also going to know what to do about it.

SHAWN STEVENSON: And that's what you really focus on in the latter part of the book.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: What are the things we can do to manage this risk, to make all these processes much more graceful, and just to help you to feel better and perform better. And so, I want to talk about that. You mentioned one earlier, which is a risk factor, which is smoking, and the impact that can have on ovaries.

DR. LISA MOSCONI: Ovarian health yeah.

SHAWN STEVENSON: But some of the things that we can do that you talk about in the book, steps to a well-nourished brain specifically. And I want to talk about some of these. One of them is to protect your brain with antioxidants.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: So why does that matter?

DR. LISA MOSCONI: That's a good one. Well, I think it really matters for a number of reasons. Number one is that the brain is the most metabolically active organ in the body. And by virtue of being so energetically active is also really sensitive and really vulnerable to oxidative stress. And oxidative stress is something that happens in your body and in your brain as you age is just a natural part of getting older. And it is, in fact, the product of glucose metabolism, creating oxygen peroxide or these oxidants. But the good news is that you can balance it out by importing antioxidants into your body and your brain by means of a healthy diet, which is really one of the few ways that we can reduce oxidative stress, is through the diet. And then the other reason that oxidative stress is such an issue, especially for women, around midlife or menopause is that we show these energy reductions in the brain that are potentially related to oxidative stress or to the brain becoming even more vulnerable to things like oxidative stress and inflammation. So, antioxidants are really important. And the good thing is that they come from foods that actually taste good. We were talking about Noni Juice.

Exactly part of it but, many veggies and fruits and nuts and seeds contain antioxidants, even caviar contains a little bit, but just a little bit. Is mostly really vegetables and fruits, which one should be eating anyway. But the important thing to know is that for women, specifically, we have evidence that three vitamins, in particular, are really helpful against oxidative stress. And these are vitamin A or beta-carotene, which is the precursor and then vitamin C and vitamin E. And the interesting thing is that vitamin C and E are also really helpful to alleviate the symptoms of menopause. So, see how everything seems to be really going hand in hand.

SHAWN STEVENSON: Yeah, absolutely. And you mentioned in the book, there was large scale studies found that elderly people consuming a good amount of vitamin E.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: Had nearly 70% lower risk of developing dementia.

DR. LISA MOSCONI: Yes. Especially when taken together with vitamin C. So, if you have both and the thing is they had it in their diets, so we need more research on that, but it looks like obtaining these nutrients, the antioxidant from the diet is actually better than getting the same nutrients from supplements because they're more biologically active and they contain more varieties of the same vitamin. So, vitamin E comes in eight different isoforms and each one of these isoforms has a slightly different effect on the brain. Like the alpha varieties, more for oxygenation, the Gama variety increases blood flow a little bit more. So, when you eat almonds or olive oil or other fruit, other nutrients, other foods that contain vitamin E you get all these different forms. Whereas usually when you buy the supplements, it's just one.

SHAWN STEVENSON: Just one, right.

DR. LISA MOSCONI: Not a variety. But also, there's a lot more in food.

SHAWN STEVENSON: Yeah. The cofactors just...

DR. LISA MOSCONI: Yeah, not just the cofactors, the interactions between different nutrients and the experience.

SHAWN STEVENSON: I hope everybody heard that there are different forms of vitamin E.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: It's not just one thing, same thing we know about vitamin D.

DR. LISA MOSCONI: Right.

SHAWN STEVENSON: But it's the same thing with vitamin C. It's the same thing with vitamin E.

DR. LISA MOSCONI: The Bs are... The B vitamins are different.

SHAWN STEVENSON: B vitamins we know about their category, you know, it's... And so, when you're taking a supplement and it says, you know, getting my, you know, 300%, of my daily value of vitamin E is that the kind you really need, you know, which is again, if you lean towards food. And so, you mentioned olive oil.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: Almonds, or nuts and seeds, avocados is another great source.

DR. LISA MOSCONI: Avocados are really great.

SHAWN STEVENSON: So yeah, it's, that's so good. So that's the first one.

DR. LISA MOSCONI: Fruit is medicine. Yes. It's really important.

SHAWN STEVENSON: Hippocrates said it.

DR. LISA MOSCONI: Yes.

SHAWN STEVENSON: Another one here is to manage your carbs.

DR. LISA MOSCONI: Manage.

SHAWN STEVENSON: So, this is interesting dichotomy because you're saying we need glucose for the brain to be able to do its thing, but we got to be cautious.

DR. LISA MOSCONI: Careful. Yes. I think... There's interesting research that was really done in women that never really gets shared outside of academia. And I didn't even know that much about it until I really started looking into that. There are these beautiful studies, mostly done at Harvard. Like the nurses' health study is a huge one, really fabulous. And they looked specifically at women and clearly showed that carbohydrates are good for women. And I think it's good to talk about it right now because you know, with all these high fat diets being so popular and so trendy, there's a tendency for many, obviously men, but also women to really stay away from carbohydrates and almost be fearful of carbohydrates. So, I think it's important to know that they're not necessarily bad for you, as long as you eat them, obviously in reasonable amounts. And also, it's important to talk about the quality of the carbs, that there are carbohydrates that really negatively impact your body mostly by negatively impacting your hormones.

And then there are like the refined carbohydrates, like white sugar, white bread, and refined pasta, pizza, all the good things and then there are the so-called good carbs that don't impact your insulin levels nearly as much, but they do provide enough glucose and fiber like complex carbohydrates. And that has been shown in a ton of studies to be really correlated with improved health in women. So, a lower risk of cognitive decline, a much lower risk of heart disease and stroke, lower risk of depression. And just for context, I'm not saying that one shouldn't be eating the fats, right. It's more like because women's bodies and brains are so dependent on estrogens, at least prior to menopause, it's helpful to know that estrogen is a carbohydrate burning hormones. So, it really helps you burn the carbohydrates as a woman.

So even if you're on a high carb diet as a woman, you're still going to burn all those carbs, whereas men, because they have more testosterone and less estrogens tend to put that away as glycogen in their tissues. So, the metabolism of carbohydrates differs between the genders, not completely, but a little bit. So, I think it's good to know that, just go for fiber. Fiber rich foods that also provide glucose for your brain. And I would also like to mention that of all the diets out there, the Mediterranean diet has been shown to really support health in women, overall health, like women on this diet have a much lower risk of cognitive decline as compared to those in more like Western diets, they have a much lower risk of heart disease or stroke or depression and/or cancer. And they also have like 30% fewer hot flashes.

So, I think it's something good to know because the Mediterranean diet is a flexible diet. It's mostly vegetables and fruits and whole grains. If you eat them legumes, if you'd rather have legumes or don't have them, you know, but heavier veggies and your fruit, and then fish is a big part of the diet, healthy fats. Like we don't have avocados, but let's throw it in there. But Extra Virgin Olive Oil is a really good source and meat, and dairy products are consumed in moderation, which is not, you shouldn't eat them. Right. Just not breakfast, lunch, and dinner, or they should be more like a treat, I think, and of course no processed food.

SHAWN STEVENSON: And this is a good segue because you mentioned one of these is to choose the right fats. And in the Nurses' Health Study, you noted that when we are looking at women taking full-fat milk versus low-fat milk, there was a big distinction there.

DR. LISA MOSCONI: Yes, in that the full-fat milk was actually better for fertility. That's a study...

SHAWN STEVENSON: Specifically for fertility.

DR. LISA MOSCONI: That was really very specifically for fertility. However, fertility is related to ovarian health and hormonal health. And the longer you're fertile, the later you go through menopause. So, in some ways, it must be good for your brain as well. And the point being that cows that make milk are pregnant cows. And so, they have all the hormones beyond lactin, but

they also have a lot of estrogens in the milk. But when you remove the fat from the milk, you're also getting rid of the hormones that are bound to fatty particles, hormones bind to fat. And what you're left with is more like a bizarre, hormonal cocktail that is more androgenic than estrogenic. So, there's this theory that by drinking low-fat or no-fat milk, you're effectively getting a lot of androgens inside your own body. I don't think their quantity, really, is that much, but it does seem to play some, some kind of role.

SHAWN STEVENSON: Yeah. And it's a simple principle to follow as well, and you outline it very clearly, go for the full-fat version.

DR. LISA MOSCONI: Yeah, why not? It tastes better.

SHAWN STEVENSON: This is how nature would produce it. Right, it tastes better. But we know we suffer through, growing up, we had one of these, like a WIC program here in the US, where it's basically like government food stores. We would go to food pantries, and we'd get these government handouts. In one of the programs, we got skim milk instead of the Vitamin D, full-fat milk which is great. But I remember pouring that skim milk over my cereal and literally feeling...

DR. LISA MOSCONI: Feeling really sad.

SHAWN STEVENSON: Yes. Why don't I just use water? This is just white water. And it would piss me off as a kid, and so I would eat the cereal dry rather than suffer through the white water.

DR. LISA MOSCONI: Oh, you poor thing.

SHAWN STEVENSON: But now we know.

DR. LISA MOSCONI: But I agree. What's the point? It doesn't taste good for sure.

SHAWN STEVENSON: Yeah. They were probably like, "Let's give it to the poor kids." So again, there's so many different important facets of having a well-nourished brain that you outline. I want to talk about maybe one or two more. I thought it was really fascinating when you mentioned, "Feed your microbes." And how does that relate? When we're thinking about brain health, how does that correlate with the microbes?

DR. LISA MOSCONI: Yeah, that's a really good question. And as usual, I go to, "How is that specifically important for women?" But the point is that the microbes in your gut, the health of your microbes has an effect on the health of your brain. So, we know that if you have more of the bad microbes and fewer of the good ones, there's a tendency to suffer more from

anxiety, for example, and depression. And sometimes anyone who's ever had food poisoning knows that you can't think straight. So, they do cloud your mind. If you have a problem in your gut, it can have an effect in your brain. And something that is interesting to me as a women's brain advocate, especially, if you will, is that fiber is excellent for really supporting gut health and also stabilizing hormonal levels. So, by feeding your gut the right way with fiber with oligosaccharides, which are the specific carbs that, they're non-digestable for us but they feed the microbes in the gut. And taking prebiotics and probiotics, hopefully from foods but also from supplements, you're not only supporting digestive health, but also, you're supporting your hormones. And I think this is something really interesting and important to keep in mind. You're doing something good for your tummy, for your hormones, and as a result, for your brain as well.

SHAWN STEVENSON: Yeah. It makes so much sense. We've been sprinkling in this conversation for years just about how powerful these microbes are in influencing our health. And just even understanding, we have all of our human genes, but then all of these microbes, these trillions, they have their own genes.

DR. LISA MOSCONI: They have their own genes.

SHAWN STEVENSON: And we're still just scratching the surface on our understanding. So definitely much more to come there. And I was like, "Of course, it has to be highlighted in your book as well."

DR. LISA MOSCONI: You know what's interesting to me about microbes and how they're related to the brain, is how surprising that was. When that correlation came out, everybody was skeptical or not quite sure. And now everybody's really into that, and I think that's a major flaw with Western medicine, how we tend to think of our bodies as a bunch of separate organs that don't speak to each other. And that's the same for women's health, because it's not about your brain or your ovaries or something else. They're a system. They speak to each other. And in my opinion, if you have a problem with your foot, your brain knows about it.

SHAWN STEVENSON: Oh, God. Yeah, absolutely.

DR. LISA MOSCONI: Even sciatica. For sure your brain must be like, "Ah!" And any big change in any organ of the body must have an effect on the brain. And I think we should really move towards a more integrative approach to health that considers all of us.

SHAWN STEVENSON: Yeah, absolutely. This is a perfect segue to the last thing I want to ask you about, which is addressing the stress component of brain health.

DR. LISA MOSCONI: Let's do that.

SHAWN STEVENSON: And this is definitely not talked about enough when we're talking about the female brain and how stress plays a big part in this.

DR. LISA MOSCONI: Yes. Well, stress plays a really big role for men and women, of course, and is the silent killer. And our society really puts people at risk for heart attacks, and strokes, and inflammation, and it impacts your brain as well. And for women, in particular, there are some very interesting brain imaging studies that's showing how if your cortisol levels are really high, the levels of your main stress hormone, your brain suffers, even already in mid-life. And those really high cortisol levels correlate with brain shrinkage and memory impairment already when you're 50 years old. But the brain shrinkage was only found in women and not in men.

So, in men, if you have high cortisol levels, your memory might suffer and your performance might suffer, but your brain is still compensating for it. Whereas women's brains, especially post-menopause, show signs of shrinkage as a response to high stress levels or chronic stress levels. And this is telling, I think, because we know that stress can literally steal your hormones. Cortisol, again, the main stress hormone, works in balance with your estrogens. So, if your cortisol goes up, your estrogens go down. Your cortisol goes down, your estrogens go back up. And this is because they have a common precursor which is called pregnenolone. So, the body needs pregnenolone to make both, cortisol and estrogens and testosterone.

And if you need to make more cortisol, the body's going to steal the pregnenolone away from your sex hormones and shuffle it towards the cortisol levels. And so, your hormones plummet. And unfortunately, there's a ton of evidence that women suffer stress or experience stress in a more severe way than men do. And again, it's not about comparing. The point is that women are stressed out and it looks like the peak is somewhere between the age of 25 and 45. And for most women really maps onto the perimenopause, which is honestly when most woman have small kids, and they have full-time jobs, and they're trying to hold on to their husbands as well, and they may have elderly parents who need help. So, there's a whole lot going on. And then stress levels really go up and you don't have time for yourself. And that also really has consequences. Not just on your health, but also on your brain health. So, for all husbands out there, partners or friends, help them out. Help those women out.

SHAWN STEVENSON: Yes. It's good advice.

DR. LISA MOSCONI: Make dinner.

SHAWN STEVENSON: We mentioned this earlier with your daughter breaking the boards and you taking that break, having that teamwork, because this is something we evolved having.

We evolved having a tribe, community. But now we're isolated, we have our little family nook somewhere and oftentimes we're not by our parents anymore, or other caregiver support systems. And sometimes we don't even have two parents. And so, I think it's important for all of us to open our minds. Because no matter what situation you are in... First of all, if you do have access and support, it's a blessing.

DR. LISA MOSCONI: Yes. Use it. Absolutely.

SHAWN STEVENSON: Use it. Be more proactive in it. And even understanding how much stress and being tied up in all that stuff is hurting your brain. But if you are in a position where you don't feel like you have that, make it an intention, open yourself up to... Because for some people it's like, "Well, I don't like my mother-in-law," or whatever it is. Another stereotype, I love my mother-in-law, alright? But that might be a situation where you open yourself up to better communication and understanding that that is another vital influence for your child to have that wisdom input, and also for you to have some time to yourself while your child is in the hands of somebody who you trust. So, open yourself up, friends and family, expanding your communication, your community, is super important. Our genes expect that of us.

DR. LISA MOSCONI: Yeah, it's true. And also, for introverts who perhaps don't want to go that way, there are other things, there are other stress reduction techniques. Like green time over screen time seems to be a big one. Meditation helps a lot of people. And especially for women, there were some interesting clinical trials showing how a regular meditation practice, even just 12 minutes a day, really lowered cortisol levels and improved oxygenation to the brain, improved blood flow to the brain, and also reduced the symptoms of perimenopause and menopause.

SHAWN STEVENSON: Blood flow's super important, oh my gosh.

DR. LISA MOSCONI: It is important. If anyone is into meditation, I think it's a great asset, it's a great tool to cultivate.

SHAWN STEVENSON: Thank you so much for tuning into the show today. I hope you got a lot of value out of this. If you did, please share this out with your friends and family, sharing is caring help to spread this empowering information and listen, we've got some incredible epic guests and masterclasses coming up very soon. So, make sure to stay tuned, take care, have an amazing day. And I'll talk with you soon. And for more after the show, make sure to head over to themodelhealthshow.com. That's where you can find all of the show notes. You can find transcriptions, videos for each episode. And if you got a comment, you can leave me a comment there as well. And please make sure to head over to iTunes and leave us a rating to let everybody know that this show is awesome. And I appreciate that so much and take care. I

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