THE MODEL HEALTH SHOW

EPISODE 592

Radically Improve Your Cognitive Speed, Agility, & Overall Performance

With Guest Louisa Nicola

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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. How can we improve our cognitive performance, our reaction time, our performance in our athletics, our day-to-day lives, our performance as a parent, as somebody who's a creative, the list goes on and on and on? There's an integration there, whether we're talking about physical performance or our cognitive performance, and today you're going to learn from one of the leading experts in the world on how to improve them all. Now, what I learned today, myself sitting here in this interview, I am literally going to implement starting tomorrow.

I can't wait because for a lot of us, we're looking at what are those things that we can do to get a little bit better or for other folks we're looking at what can we do to help to reverse some of the issues that we're dealing with. Today, we have something for everybody, and this is very, very special because it's just leaning into the fact that the human brain is so malleable and so progressive and really limitless, but often, we're not given the training on how to optimize the health and performance of our amazing brains. One of the biggest discoveries just within the last couple of decades in neuroscience is the understanding of plasticity, of neuroplasticity, the ability of the brain to continue to change and adapt and to create new connections throughout our lifetime. There was many years in the field of neuroscience and science overall that just bought into this belief that our brain is stagnant, once we reach the age of somewhere around between 21 to 25, our brain gets set in stone, today, we know that there's anything but truth to this, the human brain is continuously expansive.

Yes, that rapid growth and kind of structure of the brain gets set very early in our life, but there are so many things that we can do to continue to, as you're going to learn today, expand the volume of our gray matter, to create neurogenesis in the hippocampus and as mentioned, to create new connection so that our brain is sharper, more focused, more creative, and the list goes on and on and on. Again, today we got something for everybody. Now, speaking of focus and creativity, yes, we can train our brain through specific exercises to tap into greater resources when that comes into play, but there's also a nutritive factor as well. One of these key nutrients that actually increases our alpha brain wave. So, this is a brain wave frequency that's attributed to a higher state of enhanced focus and reduce stress and even creativity, and this key nutrient is a protein called L-Theanine. L-Theanine works to improve focus, and this is noted in the peer-reviewed journal brain topography, the researchers observed that L-Theanine intake increases, again, those alpha-brain waves, this is really attributed to being in that flow state, increases the frequency of alpha-brain waves, reduces stress enhances focus and even increases creativity.

Also, L-Theanine, what's so remarkable about it in its association with the brain is that it's one of the few nutrients, 'cause there's just a couple of dozen nutrients that's able to actually cross the blood-brain barrier and nourish the brain. There are countless other nutrients that we can take into the body, but only a select few nutrients has the ability to go into the exclusive club in the brain that cross that blood-brain barrier, velvet rope, and get into the brain itself. And L-Theanine, once it's able to cross its way into the brain, it increases the activity of specific neurotransmitter called GABA, which this is why it's attributed to its reduction of anxiety, for example, and also just making us feel more calm, centered and relaxed, definitely a place to be to be more productive and focused. The very best source of L-Theanine is going to be found in green tea. Green tea has just exploded in popularity in recent years, and for good reason, but this has been utilized for thousands of years in certain cultures, especially in cultures in Asia, for example. But there is one green tea that stands head and shoulders above all of them, and that is matcha green tea specifically, Sun Goddess Matcha green tea from Pique Teas.

It's shaded 35% longer to directly increase the L-Theanine content, and it's also crafted by a Japanese tea master. And little-known fact, there are less than 15 Japanese tea masters in the entire world. And also, this is the first matcha that's quadruple toxin screened for purity. So many teas, this is one of the other little-known facts, are contaminated with all kinds of environmental toxicants ranging from heavy metals to even toxic molds, but Sun Goddess Matcha is quadruple again, quadruple toxin screened to make sure that you're getting the highest level of purity also, there's nothing added. No sugar preservatives. No artificial anything. Go to piquelife.com/model that's P-I-Q-U-E-L-I-F-E.com/model, you get 10% off Sun Goddess Matcha green tea and everything else that Pique Life carries. Including, by the way, during this episode, and I wasn't expecting to talk about this, but you're going to hear a really powerhouse fact about cinnamon, that's really just going to make you value and understand cinnamon, this kind of common spice that many people have, but there are specific type of cinnamon, and this is the type of cinnamon that Pique Life actually carries in their cinnamon fasting tea.

So, you might want to check that one out as well. So go to piquelife.com/model for 10% off store wide, this is exclusive for the Model Health Show Family, for our audience, 10% off store wide, piquelife.com/model. Now, let's get to the Apple Podcast review of the week.

ITUNES REVIEW: Another five-star review titled “Another fact filled fascinating podcast” from Miami Nikki. "Thank you, Shawn Stevenson. You provide valuable, well-sourced and often uncommonly known information, and with care and humor. Because of listening to your podcast, I've changed the way I eat and exercise, you are a constant source of encouragement. Thank you."

SHAWN STEVENSON: No, Thank you. That means so much, thank you so much for making me a part of your universe, and thank you so much for taking the time to share your voice over on Apple Podcast. I truly, truly do appreciate that. And on that note, let's get to our special guest and topic of the day. Our guest today is neurophysiologists Louisa Nicola, and she founded Neuro Athletics to provide scientific strategies to help athletes and top investors, if we're talking about even people performing at a high level in finance and on Wall Street to achieve peak performance. Louisa was a world championship triathlete and raced both nationally and internationally for Australia, and competed at London, Beijing, and Auckland. After retiring in 2012, Louisa followed her dreams and went to Sydney Medical School and graduated with a particular interest in neurophysiology, and today, Louisa is the head performance advisor and CEO of Neuro Athletics, with their mission being to optimize mental performance and to help educate, train, and unlock human performance through science and data with a commitment to unlocking your potential. Let's jump into this conversation with the amazing Louisa Nicola. Welcome to The Model House Show.

LOUISA NICOLA: I'm so excited to be here. Finally.

SHAWN STEVENSON: Yes, finally.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: Love it, I love it. You've got some adventures already since your time here in LA, you're just hanging out with Paula Abdul. No big deal.

LOUISA NICOLA: No big deal.

SHAWN STEVENSON: Last night, but you are a neurophysiologist, a renowned neurophysiologist. If you could, let's start by sharing what a neurophysiologist actually is, what does that field contain? What is this field all about?

LOUISA NICOLA: A neurophysiologist is somebody who practices medicine, but they have a specific interest in the brain per se, and how the brain functions. So, one of our primary modalities is... Of use is an EEG an electroencephalogram. So those things where you put it on your head and you've got all these 16 or 32 electrodes coming out of your head, and what that cap is doing is measuring the functionality of your brain or the brain wave activity. So, a lot of neurophysiologists are working in epilepsy wards and... Yeah, and I spent some time in epilepsy wards, I spent some time in sleep studies, and now I use this to measure the brain of athletes and a lot of my clients. Yeah.

SHAWN STEVENSON: That's awesome, that's awesome. Because you've really taken that training and that understanding and pivoted this into performance in athletics, but this was really born out of, I'd imagine your experience as an athlete, you're an elite athlete, triathlete.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: So first of all, why? That's a lot. What got you into athletics in the first place, but specifically what got you into being a triathlete?

LOUISA NICOLA: It's a funny question because I always... I always preface this by saying that was like 20 pounds ago to be a triathlete, I'm definitely not that right now, and I remember back when I was. It was extremely intense, it's... For everybody listening it's three sports, and I actually say it's four sports because you've got to transition in between, and that's considered the fourth leg of a triathlon. So, I was a swimmer, I'm born and raised in Australia. So, we're natural swimmers. And actually, funnily enough, I decided, due to my competitive spirit to just enter myself in a race. So, I had eight weeks to train for a triathlon, I picked up a bike, I started running and the day came, and I ended up coming first, so from eight weeks of training. And it was at that time that I was picked up by an Australian triathlon coach, and he said, "Would you like to come to some training sessions with us?" So, I did, and it was love at first sight. I fell in love with the sport. Literally, they call it the tri-bug.

SHAWN STEVENSON: The tri-bug, it's never bit me.

LOUISA NICOLA: Yeah, it bit me, and it really did do a massive bite 'cause I stuck to it, day in day out 40 hours a week of training.

SHAWN STEVENSON: And then that parlayed into World Championships.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: Let's talk about those.

LOUISA NICOLA: Yeah, so I qualified for Beijing World Championship. I also qualified for the Auckland World championship series, which I came 13th in, so...

SHAWN STEVENSON: In the world in that event.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: That is bananas.

LOUISA NICOLA: Yeah, so that was a crazy event, so it's an Olympic distance event, you've got sprint distance, Olympic distance, you've got Half Ironman, Full Ironman. I've never competed in those, but... Yeah, it was... When you think about a triathlon the ability to endure and keep going, it takes a lot of mental fitness as well, and 12 years ago, 15 years ago, nobody was really talking about the brain and sports psychology. We didn't really know about that. I had to really develop that myself and understand and put myself through this rigorous mental training to just keep going, and in Australia... Well, actually all over the world. Triathlons and the race season is during summer, so it's extremely hot in Australia when you're running, you have to keep going. And it's very mentally taxing.

SHAWN STEVENSON: Yeah, that's the part of sport that... Today, of course, we're acknowledging it more from behind the scenes, but still, we don't really identify what makes somebody a Michael Jordan or a Kobe Bryant or somebody who's the top, the very, very best. It's not just the physical assets. There's such a huge cognitive component, there's such a huge psychological component to it. And so now we're being able to dig in, and your field of science specifically is looking at this.

LOUISA NICOLA: Yeah, absolutely. And you know what, I get asked often, "Well, what separates the Kobe Bryant's from the average person?" And I think I've nailed it. From all of my time of being in that space and now working with some of the best athletes in the world, my answer is, athletes at that level have the ability to do the monotonous work every single day. And this translates back into when I was a triathlete and I was at a podium level, first, second and third in Australia, and I was still, every single day, working on one-legged spins with my... We're sitting on a stationary bike with my coach and just doing a one-legged spin to make sure that my brain was communicating that cycle on just the one leg, and then we'd switch over for half an hour on the left leg so that... It was so monotonous every single day, and that really translates into excellence. And I think, when you look at some of these players, they're still doing the monotonous work every day, every single... They're not doing crazy things. They are still dribbling. They're still working on their skills. They're still working on their tactics.

SHAWN STEVENSON: Yeah. Obviously, Michael Jordan changed the sport, and a big part of it, there was this psychology, and also Ozzie Smith as well. He's a baseball player for the St. Louis Cardinals. He won like, I don't know, 13 Gold Gloves in a row, something crazy, but he was one of the first "big players", big name players to implement strength training because there were all of these myths around it, like you could be too bulky, you'll lose your flexibility, whatever the case might be. But with... In Ozzie's case and also with Michael Jordan, him seeing the benefit of being physically stronger, and also what it did for him psychologically, and I'm bringing this up because his trainer, Tim Grover, he's been on my show a couple of times, I

loved him, but Michael Jordan told him, he's like, "I'm not paying you to train me. I'm paying you not to train anyone else."

LOUISA NICOLA: I love that.

SHAWN STEVENSON: And so, he was there, on call, doing the monotonous work daily, over and over. And here's this crazy... This is the craziest thing. I still don't get it, and I can't say I agree, but look at the results. He would lift before every game. Every game day, they were in the gym lifting. How on earth is that even a thing? You know what I mean? It's just like, again, but it's those neuro-associations, those patterns. And I'm so glad that you brought this up. So, is this what kind of sparked your interest when you had the options of like, "This is what I'm going to do in medicine, I'm going to focus on neurophysiology?"

LOUISA NICOLA: Well, look, it's interesting. I always loved, obviously, the world of athletics. My favorite sport to watch his soccer, or European football, I should say. But when I was spending time in the neurophysiology lab, I was looking a lot at early-onset Alzheimer's disease. I was looking at pre-dementia states, like mild cognitive impairment. We were doing these brain scans with an EEG on dementia patients, and we were checking to see how well their brain is functioning, and I was doing so many. And it gives you a 30-page report. And as I kept doing these, I was like, probably I had done 1000. And when you look at the pathology and the pathophysiology of Alzheimer's disease, phosphorylated tau proteins, it can be somewhat comparable to what happens in somebody who has chronic traumatic encephalopathy, which is repeated hits to the head, repeated concussions. And these two... This really sparked my interest. And I remember talking to my attending at the time, and I said, "Well... " I said, "If we're doing these on dementia patients and early-onset Alzheimer's disease patients, can we also scan the brains of NFL athletes to see how well their brain is functioning after a concussion?"

And he looked at me and said, "I have no idea. Why would you even bring that up?" And it really interests me, and I realized nobody was doing that in the NFL. So, I contacted a team and I asked them if I could bring this hospital grade EEG scan and scan their players' brains after they have been concussed, and they let me do that. And so that was pretty much the birth of Neuro Athletics, the intersection of neuroscience and athletic performance. And when you take a scan, and you look at every department of a high-performing team, the Knicks, or you look at Major League Baseball, most of them have a strength trainer. Most of them have a fitness trainer. Some of them have nutritionists. Some of them have a sport psychologist. Nobody has a neuroscientist. Nobody has somebody responsible for the brain. Then you look at some of the physicians in the NFL, and I still couldn't find a neurologist on the team. There were sports medical physicians, general practitioners. There was no neurologist, and that was also fascinating to me to think, "Wow, these teams that are... Some players are earning upwards of $10 million, but nobody's looking at their brain." And I thought, "Wow, imagine how

many points I could get this player if I could just scan his brain, figure out what are the areas of dysfunction, and work on them."

SHAWN STEVENSON: And this is so fascinating. I didn't know that connecting the degradation of the brain was what really sparked your interest in this and looking at Alzheimer's and this parallel with being hit in the head basically. But that's like you're able to look at and to monitor and understand this degradation...

LOUISA NICOLA: Absolutely.

SHAWN STEVENSON: But then, the flip side was, looking at enhanced performance.

LOUISA NICOLA: Yes, and so look, how are you going to measure... For example, let's say a player gets hit. Depending on the velocity at which he got hit, he could be mildly concussed, he could have a small concussion, he may not even be concussed, and you can't really test for or diagnose CTE until you... They pass away and then you cut their brains open. That's why we have a brain bank. We have one in Australia, and there is a really successful one here in Chicago, I believe, where they're doing a lot of studies on players who have either passed away or they've suffered this illness and they cut their brains open, and you literally see these blood clots and these clumps just falling out of their brain, and you can't pick that up on an MRI, you can't pick that up on an EEG, however, you can pick up on the dysfunctions, which can be comparable to a concussion.

SHAWN STEVENSON: So, let's flip the switch now to the... So, we know about this degradation...

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: And what could be seen, and unfortunate... Of course, technology's going to evolve to the place where we can pinpoint these things sooner, and that's what's so awesome about this. But you're already leaning into this and using technology to be able to monitor what's happening with the brain and cognitive performance, so you mentioned Neuro Athletics.

LOUISA NICOLA: Yes.

SHAWN STEVENSON: So, this is your baby.

LOUISA NICOLA: This is my child.

SHAWN STEVENSON: So, let's talk about Neuro Athletics and what this entails.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: For us as the general public, just want to improve our health and performance and also for the athletes that you work with.

LOUISA NICOLA: Yeah, so we're in two... I always say we're in two fields, we're in the athletic space, we're also in the finance space, so we have a couple of hedge funds that we look after at Neuro Athletics. And let me tell you, when I scan the brains of some of these Wall Street titans I call them, their brain, it's very fascinating what you see, the amount of inflammation in their brain and we can touch on that further on, but Neuro Athletics is my company, we're a full-service neuroscience company, we service the business and the finance population, but we also serve the athletes, mainly the elite athletes. But look, we've also got a suite of digital products where everybody can learn about the brain, they can learn about better health for their brain, better aging process for their brain.

SHAWN STEVENSON: With this technology, we can see that different people can have dramatically different cognitive performance, like their brain activity...

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: Let's just say an fMRI, for example.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: We can put somebody in and check out their brain and give them different stimulus, show them different images, whatever the case might be, and just depending upon our training...

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: And our experiences, our brains can function dramatically different from one person to the next.

LOUISA NICOLA: Oh, absolutely, and when you're looking at fMRI and looking at the functionality and the blood flow, we can see how well your brain literally is functioning, which areas are lighting up in response to a stimulus. In fact, when I use this EEG, you perform tasks, and one of the tasks is a reaction training task, and you're holding a stick and you have to... Or a joystick, if you will, you have to click a button every time a big circle comes up on the screen, and it measures the response to that stimulus, and it does that over time, so it does create a

lot of neural pressure. So, when you're doing it for 10 minutes, you kind of miss it, and that's the same as in tennis, for example, these tennis players, they're playing some of them for two hours, three hours in this heat, and it becomes extremely mentally taxing. So, it's like, well, how can we measure your reaction time when you've been playing for two or three hours, and can we train you to endure through that and keep reacting the same as you would at the start of the game.

SHAWN STEVENSON: So, it's not just... This is the fascinating thing, I'm so grateful to have you here. It's not just the act of physically doing the thing over and over again, because that in some ways has its limits, it's being able to train your brain. Literally focus on training your brain for that specific pathway, and you've got some really incredible... Like I just spend a lot of time watching your videos and seeing some of the exercises and drills that you have athletes doing, for example, you've got foot drills while bouncing a tennis ball. Let's talk a little bit about some of these drills.

LOUISA NICOLA: Yeah, so that... I call that my Neuro Athletics training really. We formulated this method back in 2016 and let me just do a quick recap of neuroscience, okay. So, people think that it's just about them hitting the ball, let's take tennis, for example. So many things happen in your brain, for you to be able to just swing the bat and hit the racket, I should say. So many things happen. So, what happens? Well, you first have to perceive a ball coming, okay, you perceive that with your eyes, the ball is coming to you. Depending on how well your vision is, if you're a 20/20 vision, if you're 20/12 however... You then are able to respond to that stimulus neurologically. So your eyes, obviously two pieces of the brain that are connected to the brain via the optic nerve, so your eyes, the retina sees this image, it shoots a message down the optic nerve, this then travels through the cortex all the way back to this area in the back of the brain, and that then says, okay, this is a ball and it's coming to us at this trajectory, and that then sends a signal down into the...

Whether it's the leg, if you're going to kick something or if it's the hand to say, hit this ball like this at this angle. So many things happen, this pathway is getting stressed, and we don't see it this way, but we can train that pathway, we can train the stimulus, where you can see a ball coming to you to how it goes through to the occipital lobe, the back of the brain, and see images. So that process there, we can train that, and I can record it and I can say, "Well, you're now reacting a stimulus... At a reaction time of 0.5, for example, let's get you down to 0.2." And it's about how can we train those connections to fire faster and that's what we're about. So, we really say that we work with a margin of error is very, very small, which is why it's... I spend my time with very elite athletes who... Like Formula One, for example, if we can get the fifth person, that if you look at the top five, if I can get... Maybe shave like 0.2 seconds of his reaction time, he may be third place, so the margin of error is very, very small.

SHAWN STEVENSON: I would imagine that just some of these drills would be just great for our longevity of our brain, the cognitive performance. So, two things, can you give an example of what one of these drills would look like that you do with an athlete? And also, would there be any benefit that I could extract, for example, with just like throwing a tennis ball at a wall and just working on catching it with different hands?

LOUISA NICOLA: It turns out, yes. So, when it comes to the brain and physical activity, we have three different segments. We have got resistance training, we have got aerobic training, then we have got this sub-specialty. It's called neuro-motor training. I now call it neuro-athletics training, and this has been printed in journals such as Nature. So, there is a wonderful study that's done in Nature, showing that individuals who do juggling can grow the gray matter of their brain, and that is wild to me, through juggling. So, once I got this skill, this neuro-motor training, literally motor, body, and neurology put together, then you've got the coupling of open-skilled, for example, movements such as juggling, you're juggling two balls.

What we can then do with two tennis balls, for example, this is like a very easy basic program at Neuro Athletics. Get two tennis balls, you stand a meter away from the wall and you're just throwing them. Let's just say you start with one. You throw with your right hand, you catch with your left hand, and then you throw it back and you're catching. What's that doing? First of all, you're taking a hand-eye coordination into perspective, especially if you line it up with your eyes and not do overhand throw... Fire up to make it very hard, line it up because it's very hard to sustain for two minutes if you're not used to it. So, you've got hand-eye coordination. You've got vision training happening, you've got stability, you've got concentration, focus, you've got so many different cognitive processes happening with such a simple task. And going back to growing the gray matter of your brain, it turns out that 80% of brain gray matter is modifiable by physical activity alone.

SHAWN STEVENSON: Incredible.

LOUISA NICOLA: It is incredible. So, if we now have studies in clinical studies, RCTs in humans, of course, and in mice, that we can grow our brain structurally, we can change the functioning of our brain through physical activity, then why wouldn't we be doing this? So, then we can go a step further. Okay. So, you've got the ball. Okay? Let's think about how the brain is. We have got two hemispheres. We have got a left hemisphere. We have got a right hemisphere, and they are put together by this thing called the corpus callosum. It's like a little bridge between the two. The left side of the brain is responsible for the right side of the body, and the right side of the brain is responsible for the left side of the body. So, the next step up from this might be if you're throwing a tennis sport to the wall with your left hand, maybe just stand on your right leg and we change it up and you've got this balancing act. Yeah.

SHAWN STEVENSON: That's so cool. So, what about the juggling? I think you mentioned having two tennis balls and it sounds like it's getting super complex here.

LOUISA NICOLA: Yeah, so well, then we can go a step further and you're throwing the one ball with the right hand, then you're throwing one ball with the left hand, and then so you see you're catching with the same hand and that becomes even more difficult. And we always have a rule at Neuro Athletics, you're always throwing overhand and you're always catching overhand, so you're cupping the ball. And then you can move another meter away. It makes it even harder. And then if you're a veteran at Neuro Athletics, we're doing many things. We're using lights, we're using FITLIGHT. It's a reaction training light system. We're using strobe goggles, where we're literally making our athletes blind in one eye and getting them to still perform the tasks blind. So, when they take the goggles off, they've got enhanced vision. So, we do vision training like that. There's just so many different variations. I think we're up to now, I think, like 550 variations.

SHAWN STEVENSON: Oh, my goodness. This is some straight up ninja training. I love it.

LOUISA NICOLA: Yeah, its brain ninja training, if you will.

SHAWN STEVENSON: Yeah, this is so cool. I see my son, Braden, over here. He's doing some ninja moves. I brought him in. This is part of his education. He gets to sit in on experiences like this and conversations like this, and this is something... We're big on speed of implementation.

LOUISA NICOLA: Oh, I love that.

SHAWN STEVENSON: So, I just got a bag of tennis balls that just arrived yesterday actually, so we're going to implement this and play around with this and just... These are simple things that, just to keep our brains youthful. And I want to talk about that in a little bit, but I really want to dig in a little bit more here with one of the things that I saw your athletes doing, for example. You just gave a good example, like just doing things on one foot, for example, but we could expand the level of complexity. You said how many different variations? How many hundreds?

LOUISA NICOLA: Over 500.

SHAWN STEVENSON: Over 500 variations. And this brings about a level of creativity, just you being in this space and having a great body of work with all the different people that you've had the opportunity to work with, the different brains you've had a peek at, this creates such a level of expertise and understanding. And this is what I really admire about you, is that it's

not just based on a hypothesis at this point. It's like you are literally seeing what's happening in the brain and seeing people improve.

LOUISA NICOLA: And that's another thing. It's very important to us that nothing here is our opinions. Everything does come from science. We use a hospital-grade EEG, something that you would use to scan a brain of somebody, who's been having seizures and who has epilepsy. So, this is a hospital grade EEG. Then look, we also go into other things such as blood work analysis, genetics. We have an ophthalmologist on board who looks literally at your eyes, like finding out the structure of your eyes and how well your vision is, and there's... Within vision, there's another 20 different components that we can touch on. Yeah.

SHAWN STEVENSON: This is so awesome. Oh, my goodness. Okay, so this is one of the most fascinating things that we just overlook in our lives. We tend to get jaded obviously, like if stuff is working good and we're just living life. But just to understand this piece that your eyes are literally an extension of your nervous system. It's kind of like... So, this is what I want to ask you about because the nervous system... Is this kind of broad term, right? We might think about our brain. You might think about some of the extensions that come down like the little branching, but we don't think about our skin, for example, being a part that's sensing our environment and sending this immediate feedback at lightning speed. And it's just like how healthy are these signals, right? And how healthy are your eyes? Because this nervous system is one of the things that makes us human.

LOUISA NICOLA: Yeah, well, I always actually say that. I say, "We all share something really beautiful in common, and that is the nervous system." And a really great way of understanding it from a baseline is, we have a central nervous system. Central nervous system is the brain and spinal cord alone. We've got the peripheral nervous system. And that is, all of the nerves that come off the central nervous system, the spinal cord and then go into different organs and different areas of the human body. So, we are literally connected. We each have one, and it can be trained. And it's working all of the time. We are always using 100% of a brain 100% of the time. And it's sensing information from our eyes, from our skin, from our feet, yeah.

SHAWN STEVENSON: It's so cool. And I love this that you just mentioned, we're using 100% of our brain, a 100% of the time. But in our culture, we are led to believe there's these little cute terms we're only using 5% of our brain or... Now, obviously, that's not true. There aren't parts of your brain that just like, "I'm not doing anything. Forget you guys. I'm just going to sit on the couch." But at the same time, it's a matter of how well your brain is working, 'cause that 100% can be magnified. You're using 100% of your brain, 100% of the time, but can we do it better?

LOUISA NICOLA: Yeah. And so, at the age of 25, we've pretty much set in our ways with our brain. Our brain is not developing. It's fully developed at around 25 years old. And then what happens is we have this thing called the brain aging theories. There's many theories about how our brain ages and why. And there's really, I would say, the top three that stand out to me is, the first theory suggests that as we age, we have a degeneration in the white matter of our brain. So, we have gray matter, and we have white matter. And the white matter houses all of our myelinated neurons. So, this theory suggests that just as the brain ages as a natural aging process, we have these white matter lesions that occur. So that's the first theory. There's another theory to the natural aging process, okay? And that states that we have a dysregulation in dopamine receptors in the frontal part of our brain. So, we have four lobes of the human brain, okay? And the frontal lobe... I always... It's like a little task. I get everybody to do. I say, "Hold out your right hand and put your palm just on your forehead." And that's where your frontal lobe lives. And it's pretty much the size of our palm. And that houses the prefrontal cortex.

We hear about that. It's like the CEO of our brain. It houses our decision-making, our executive functions. So, we also have dopamine that resides there. And dopamine is this molecule responsible for many things such as motivation and drive. So as a natural brain aging process, what happens is we have less efficacy to recruit that dopamine. This is why when I speak to my mother who is 65 and I say, "Mom, you need to get out and run," she's like, "I'm just not motivated to do that today," which many people are at that age and it's just a natural process. And then the third theory that stands out to me is that we have just natural degeneration just due to getting old, neuro degeneration. So, we have these three theories. And it's going to be happening to every one of us. But we have the ability now to starve off these neurodegenerative processes. We can do that through the nutritional domain. We can do that through the exercise interventions domain. And we can do that through sleep. So, these are the three domains that we really work in at Neuro Athletics. So, scanning the brain is just step one.

SHAWN STEVENSON: So, we got these three specific things. Again, there are mountains of peer reviewed evidence on how these not only control our cognitive function, but also protect us from degradation from different brain diseases and the like. So, you mentioned something early on there, myelination. So, can you talk a little bit about myelin? What it is? And is there a way that we can maybe create more myelin to help us to do stuff that we want to do in our lives?

LOUISA NICOLA: Oh, I will. Well, here we go. We're about to touch on another myth, okay? There's another... You mentioned one myth. And I believe it came from an "I love Lucy" movie or series where they stated that you're only using 10% of your brain. That was the myth one that we've just covered. That's a myth. We are always using 100% of the brain. There is another

myth out there that we need to debunk. And that is the myth of neurogenesis, the creation of new neurons. It actually doesn't exist in humans to the extent that everybody is speaking about. We've seen that it can exist in areas in the hippoca...

SHAWN STEVENSON: Specific parts of the brain.

LOUISA NICOLA: Yes, however, it's a very... It's not like we can just... "Okay, just eat this and grow new neurons." So that's another myth we need to...

SHAWN STEVENSON: And that's the... So, the memory center of the brain, the hippocampus?

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: Is that... That's the prime spot where we can see this activity which even that was thought to be something that didn't exist, but when we talk about the creation of new brain cells, we're largely talking about the hippocampus.

LOUISA NICOLA: Correct. And still, there's still a lot of controversy around that. However, it has been seen in rodents and in mice. So that's one thing that we need to cover. Now, you mentioned myelin. So, we have cells throughout our body, okay? And we have the same cells in our brain. They're called neurons. The only difference is our neurons have these axons attached to them, okay? These dendrites. And that's how they communicate to each other. Now along this axon, if you can think of a cell body and the dendrites.

Along this axon, is this thing called myelin, and it's responsible for how we transmit a signal from one brain cell to the next. Now, it turns out that when we have neurodegenerative diseases such as multiple sclerosis, neuromyelitis Optica, like many different diseases, we see a gap between the myelin. So, they are there in these little... If anybody is watching us right now, I'm doing hand actions, they are in these little, I would say like little pellets. And due to neurodegeneration, if you've got one of these diseases, you can see gaps in these. You can see a complete elimination of this myelin, which means that there's not going to be any transduction, no signal going to one cell to the next. So, this is how we conduct our signal. So, when we're talking about these myelinated neurons and conductions of signals, which is where our habits are also being formed, if we are having a... If we are getting a decreased amount of that as we get older, then things are not going to become as easy to us. We're not going to be able to react fast enough. The habits that we used to know when we were younger are not going to be there.

Your question around, can we help the myelin sheath? Well, I think that's a conversation about neuroplasticity. The brain's ability to rewire in response to an action, and we can. We have

adult neuroplasticity, and it actually occurs during sleep. So, if we want to perform a task and get really great at it. I describe it... If we're talking about neuroplasticity, I describe it as imagine we're going down, there's all these different highways. And however, many times you go down the same highway, you keep transacting that signal, you grow that myelin sheath, you keep going down, so you're forming a new habit. A new habit is being created, and we can do that with perfect practice of a specific task. You keep going down the same highway, you'll be able to have a better habit over time. So that's what I'm talking about when I talk about these signals and these pathways.

SHAWN STEVENSON: So essentially that's when it becomes second nature. When we use a term like that.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: I just came off the elevator here as we pulled up, my son and I, he's like, "You've been coming here a while. You just kind of know where to go."

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: Since the last time, maybe, a time or two before that, he came along with me.

LOUISA NICOLA: Well, here's the thing. Neuroplasticity has two parts, okay? The start of it is learning the action, but it actually gets embedded in the brain during sleep. So, if we are not optimizing for sleep after we learn something or after we do a specific task, we're not going to be accelerating the neuroplasticity. In fact, some of the studies that's being done on this have... They've shown that you get somebody to complete a task and then you have them do a 20-minute nap. And that's how they're really working on that in the clinical setting.

SHAWN STEVENSON: Yeah. That's so cool. So cool. If we could just again anchor this into our culture because it's so work heavy, right? You've got to outwork everybody, and this whole thing, which is the work is an aspect of it, but it's the recovery specifically in sleep. There are certain things that just cannot be replicated or matched. There's no supplement, there's no training that can outdo because it's our biology. It's like it's how we're designed; it's how we evolve. Is to anchor those things and have all of that connectivity taking place while we're sleeping.

LOUISA NICOLA: Yeah, absolutely. Sleeping there is... It is the most underrated high-performance tool that we have and I consider it like putting batteries in your cell. You are literally feeding every cell in your body when you learn how to sleep well.

SHAWN STEVENSON: So, you mentioned dopamine as well and this being a potential issue or leverage point and there's so much coming out about it. We've got like 50-ish neurotransmitters that we know about right now. But this one, it often... People put it in these... Same with serotonin like it's this dual hormone neurotransmitter "feel good." But dopamine is really more of a driver of motivation. It has more of an aspect of that and then the reward system looped in with the opiate system, that whole thing. So can you talk about the role that dopamine plays for us and also what can possibly drive down our... It's not just the production. This is why I'm struggling to even say this. It's not just the fact of making the thing, but it's the sensitivity of the cells to the thing.

LOUISA NICOLA: Yeah. And that just comes down to what are you doing every single day to have a better aging brain. So, like we mentioned, dopamine, it's a neuro modulator that is responsible... I always describe it as something that's released in pursuit of a goal. So, once you go out and you're motivated to do something, maybe it's a five-kilometer run. If you go out and you say to yourself, "In ten weeks, I want to be able to run a five-kilometer race in 20 minutes." I'm using kilometers 'cause I'm on the metric system in Australia. That would be four-minute K pace. Let's just say in the very first week you go out and you run that five K, and you just blow your legs, and you hate it, you've depleted that circuit because you've told yourself, "I'm worthless, I'm not going to do this. This is pathetic."

However, if you set yourself small tasks by saying, "Okay, the race is in eight weeks, I'm going to separate this, I'm going to backtrack and reverse engineer this every single week. I'm going to aim to hit a five minute per K time in the first week." If you do that and you achieve that goal, it says to your brain, you can do this, and it gives you motivation. You get this release of dopamine like you've achieved something. So, then you have more dopamine ready to go out and do the next kilometer the following week. But if you go and set yourself these unrealistic tasks, you're setting yourself up for failure. And we know this, but now we also have a scientific validation for it. So, it's a wonderful thing if you can get to know it really well and if you can use it to your advantage by setting yourself achievable tasks, achievable but not too easy. So literally setting yourself a task of, "I'm going to hit maybe four 50K pace next week.

SHAWN STEVENSON: So, this is really powerful. I hope everybody really, really gets this, because we're looking at what's happening internally, it's not just you lack motivation, certain people are lazy or whatever the case might be, it's looking at and understanding how our brain and nervous system is working and having that right dose of... You've got that dopamine, that initial... If you look at this gap between our initial motivation for a thing versus what it's like in a week or two, or three or down the line, so it's having the right leverage to keep that motivation going, that dopamine driving us towards a thing without creating that biochemical feedback, that experiential feedback that, "This is too hard. I'm not good enough." All of these

things, because when we have that drive to do a thing and then we're met with an intense amount of pain, what's that telling our nervous system to do? Which is to go sit our ass down somewhere.

LOUISA NICOLA: Yeah, and don't perform the task again, 'cause you will fail. That's what it's saying. Yeah, and look, you can take this into every area of life, you can take this into finance, for example. Some people... And I'm guilty of this back in... When I was younger and I thought, okay, I'm just going to... I really want to save up for something, let's call that X, so you go through and then you just don't spend anything, okay. And you're like, "I'm just going to save everything, and I just will not spend anything." It's like two weeks into it. You're like, "I hate this life," then you just go and spend even more. And so, you can take this into, hey, if I'm earning let's just say $1000 a week, okay, how much do I need? And it comes into a budgeting perspective too, so I think you can use this in every area of life.

SHAWN STEVENSON: That's so good. And then understanding, again, this goes back to something I said earlier, which is everybody's brain operates differently and there's going to be... It's based on our experiences and our training, and so there are people who have a much bigger bandwidth when it comes to just automatically, like rip the band-aid off, I'm just saving, it is what it is, done. Versus somebody that's got to ease into it a little bit. The same thing with exercise, the same thing with the diet program, the same thing with our sleep, so it's understanding... And this is the cool part, is that you can actually look at the brain now and see where somebody existing in the spectrum. I want to go back and give a specific example of how somebody's life experience might have different cognitive or brain activity, specific brain activity based on what they've been through in their life that we can monitor. So again, let's say somebody's... We use an fMRI and maybe show somebody an image of a knife and one person's brain lights up one way and somebody else's brain light up a different way.

LOUISA NICOLA: Yeah, absolutely, you can see that. You can see trauma in a brain through this. I also want to mention... This is just my opinion, okay. You said that our experiences and our values and our beliefs have shaped our brain and very well, so outside of any genetic mutations, let's just say that that's correct. I'm finding now that we now can have a third component, and I think that we are being shaped by who we follow and what we see, and I really believe that our brain is now being reshaped and remodeled as well from these things that we are seeing on our computer or on our phones. Let's just say we continue to follow fitness people and we continue to follow them; you're going to see that and that's going to reshape your beliefs and re-wire things, and I honestly think that we are now living in a world where you are who you follow.

SHAWN STEVENSON: That's powerful.

LOUISA NICOLA: It's powerful and it's very scary. It's very scary when you think about that because it's an unconscious... I don't have Instagram on my phone anymore for this reason, and... 'Cause I used to remember it's mindlessly just scrolling through, and I think, "How do I know so much information about these people," and I don't want that in my brain.

SHAWN STEVENSON: We were never designed... Our brain is not wired up for that.

LOUISA NICOLA: And you've got to preserve the energy, okay, there's so much going on with every thought that you do, with every action that you produce, you are taking energy away from your brain. And it was upsetting me to know that energy is being taken away from my brain because I know what this person on Instagram is drinking today in her smoothie, and that would upset me. So I think that that's another thing that we should definitely focus on when you're looking at... When you're looking at how the brain is functioning.

SHAWN STEVENSON: Yeah, today we have this input that's never existed before, and we have no idea of the ramifications, it's going to take us decades to really hone in on it because it's so invasive and it's so funny, just... It was just last week, I was looking into this specific thing, there was some pretty recent data coming from Princeton and some researchers, they are looking at how the human brain syncs up with other brains when in conversation, for example. But specifically, they did an experiment looking at content, like if somebody's watching a certain video and how their brain starts to pattern and fire a certain way, and the next person watching the same thing, their brain would sync up and fire a certain way as well, watching the same kind of... Because the thing is, you would think, again, based on just their experience, the brain's going to be firing differently, but because of this "entertainment" or things that we are watching, whether it's social media or the like, our brains start to sync up in a certain way, witnessing certain types of things. Now, you said this, this could be definitely scary, but it can also be empowering, it's a matter of awareness. So, it's just like most people are not aware, they have no idea this is going on, and they're just jumping on to these different platforms and letting the platforms have their way with their brain.

LOUISA NICOLA: Yeah, and even depending on when you view it, are you viewing it right before you go to sleep and then it just penetrates into your brain, it's also a lazy mental... I would say fatigue. When your brain is fatigue-ing, the first thing you want to do is you want to go and you just want to scroll, you want to get on Instagram, and you don't realize what you're scrolling through and what it's doing to your brain.

SHAWN STEVENSON: There's this new term, it's called cyberloafing.

LOUISA NICOLA: Cyberloafing. Okay.

SHAWN STEVENSON: Yeah, and so one of the studies that... I might have put as a bonus in my first book in Sleep Smarter, but it came out a little bit later, but they were looking at when folks are sleep deprived. You got this sleepy brain and essentially going from their baseline amount of sleep, so maybe it's... Let's just say it's eight hours a night, every hour of sleep loss the following day, they're cyberloafing, their tendency towards cyberloafing, which is just mindlessly jumping online, you're supposed to be doing your work and you just... Let me just check real quick. It bumped up 20% each hour lost, and it was just like, Holy... And of course, we can see this in our own lives when we're tired, we didn't get a good night sleep. We're going to have a tendency to just kind of mindlessly do other stuff, get off task more easily.

LOUISA NICOLA: But that actually is the same as eating, you tend to just be mindlessly eating and more so the sugary items when you're sleep-deprived, so it's the same thing.

SHAWN STEVENSON: Got a quick break coming up, we'll be right back. Neuroplasticity, the ability of the human brain to grow and adapt and evolve, really to unlock our superhuman capacity is driven by our experiences, our practices, our activities, but also our nutrition. Fascinating new research published in the journal, Neuron found that magnesium, this key electrolyte is able to restore critical brain plasticity and improve overall cognitive function. Again, neuroplasticity is the ability of our brain to change and adapt. Now, this is one key electrolyte, but it works in tandem with other electrolytes, like sodium. Sodium is critical for maintaining proper hydration of the human brain. If you didn't know this, the human brain is primarily made of water, we're talking somewhere in the ballpark of 75%, upwards of 80% water. It's so important because just a small decrease in our body's optimal hydration level... What's not in the data, just a 2% decrease in our baseline hydration level can lead to dramatic cognitive decline. Helping to sustain, maintain proper hydration levels in the brain, sodium is critical in that. And also, researchers at McGill University found that sodium functions as a "off-on switch" for specific neurotransmitters that support our cognitive function and protect our brains from numerous degenerative diseases.

Right now, the number one electrolyte company in the world is delivering a gift for new and returning customers. With each purchase of LMNT, that's L-M-N-T, the number one electrolyte in the market. No binders, no fillers, no artificial ingredients, no crazy sugar, and sweeteners. My friend's son was just over at our house, and my son, my oldest son, Jorden, was training them, taking his teammates through some workouts. And we open the freezer and there's a bottle of Gatorade, there's a bottle of Gatorade in our freezer. And my wife is like, "Whose is this?" 'Cause we know we don't roll like that. We don't mess with the Gators; we don't mess with the Gatorades. And we knew who it was, it was one of his friends and he came and he's like, "Well, at least this is the no sugar kind." And then I go through some of the ingredients with him and I find those curve balls of like, here's where they're sneaking in these artificial ingredients and things that the human body has no association with. But he's taken a step in

the right direction by being in our environment, so you know what I did? I put the LMNT in his hand, alright, make sure that he's got the good stuff, the very best stuff.

And also, this is backed by peer-reviewed data and a huge body of evidence. And we're talking about the folks at LMNT. That's L-M-N-T. Go to drinklmnt.com/model. And you're going to get a special gift pack with every purchase, whether you're a new or previous customer, who LMNTs. So again, this is a brand-new opportunity, free gift pack with every purchase over at LMNT. Go to drink-L-M-N-T.com/model. And now, back to the show.

So, I want to circle back to the myelin again because... So, you mentioned some neuro-degenerative conditions where we can have the myelin just basically falling away. And you mentioned the axons and the dendrites, and so our brain cells basically linking up and talking to each other, creating this connectivity. And myelin is essentially allowing that transduction to take place. Now that can be degraded, but can it be improved by what means. And by the way, you already mentioned going down that highway again and again, so that's definitely one modality is just training ourselves through repetition.

LOUISA NICOLA: Yeah. And so, when I talk about different neuro-degenerative diseases, so if we have... You line up all of these axons or all of these brain cells from a dementia patient, from a myasthenia gravis patient, from a MS, multiple sclerosis patient, you can see different areas of that myelin that's been affected. Okay, one may have completely no myelin, okay? So therefore, there is no signal going from one brain cell to the next. Then you can have myelin where it's half of it is maybe not there, and so there's a huge gap. So maybe the signal goes and then it just stops, and then you've got myelin that is just degrading, the sheaths are just degrading, and therefore you've got a very, very slow conduction speed. So, we can see this now and this is what's present in different types of disorders and diseases.

When I was talking about myelinated neurons as it relates to the brain aging process. Okay? Let's just take a trip right now, 'cause you'll better understand it this way. A trip through memory lane around all of the science that's being done on the relationship between aerobic activity, or exercise we'll say, and the brain. Okay? So back in 1999, this is when the first studies were done to show the relationship between exercise and brain health, what they did was they took a group of rodents and they put them through six months of aerobic activity. And what they found was that they grew the hippocampus, new neurons in the hippocampus of these mice. I repeat, of these mice, not humans. So, 1999, we realized, oh, with physical activity we can grow the hippocampus of these mice. That's interesting. Then there was a bit of a break. Then in 2017, there was another study done. Okay?

And this one was on humans. So, they put them through rigorous aerobic activity for six months, and what they found was that they grew new connections in the hippocampal sub-

regions. So, around the hippocampus and the subregions around there, they grew new connections. So, synaptogenesis. So, literally, we can get better conduction, better running down that highway, better myelin sheath, through physical activity alone. Okay? So that's the difference. I'm going to keep going on this. Then in 2019, Harold et al did a wonderful systematic review where he pooled together everyone who was studying the brain and physical activity, but he had a focus on resistance training.

Okay? So, a lot of people, all through the 2000s, we were hearing BDNF, Brain-Derived Neurotrophic Factor. And that's a growth factor for the brain. And we were hearing about this, we were hearing that when you exercise, large bouts of aerobic activity, you get this influx of BDNF, and we knew about that. But when you look at this wonderful systematic review, he found that resistance training does a whole lot more. It releases these wonderful hormones, or myokines, if you will, muscle-based proteins, that act on the brain, that can then also enhance the synapses and the connections. So that was just... That study is absolutely wonderful. And then I'd be remiss if I didn't draw upon a study that was done in 2021 on humans, but specifically MCI. So mild cognitive impairment. That is a pre-dementia state. Okay? So, you're on your way to dementia.

They took these individuals and put them through, again, six to 12 months of intense aerobic activity. Guess what they found? They found that they could stave off Alzheimer's disease by 20 years, through physical activity alone. This is mind-blowing. So, when you think about the myelin sheath and the connections and the white matter lesions due to the natural aging process, that we can, A, stop the process from happening through physical activity alone. B, we can enhance our cognitive performance, that's our reaction time, and our thinking, everything that makes up who we are, through resistance training, and we can also grow our brain. We can grow the gray matter of our brain through these modalities. And I would say that then we've got the wrong picture of training. People are walking into the gym saying, "I just want to look good; I want to be thin, I want to slim up," whatever it is that they... Instead of saying, "I'm going to the gym for my brain."

SHAWN STEVENSON: Yeah. Oh, this is so powerful. Because that's part of the reason that I believe so many of us don't take advantage of this. 'Cause we all have access. If you have a body, you have the opportunity to do some kind of strength training or exercise. But it's because it's just this vanilla thing, which is a superficial metric, a vanity thing. Which is cool, nobody's like, I want to look terrible. But if we are not educated on the fact that you're going to have Alzheimer's. It's skyrocketing right now. It's right there around the top 10 cause of death in the United States.

LOUISA NICOLA: I think the newest statistic is, in America, I think it was 88 million people have Alzheimer's disease.

SHAWN STEVENSON: Crazy. Crazy.

LOUISA NICOLA: However, here's the thing that's going to make you fall off your seat. 90% of individuals with Alzheimer's disease have the non-genetic form.

SHAWN STEVENSON: Oh. Come on. That's... Yeah.

LOUISA NICOLA: Yeah, when we're born, we've got 20,000 genes in the human genome and you possess these alleles, okay? One from mom and one from dad. And if you are born with the APOE4 allele, okay? You are predisposed to getting Alzheimer's disease. So that is the genetic form. So that is just we can't help that, that's how you were born. But to know that 90% of individuals with Alzheimer's disease have got the non-genetic form, so they have either eaten their way there, they've sleep-deprived their way there, they've not participated in physical activity, they've gotten themselves there, or they've stressed their way to that, is really scary to me. But it's also evidence that we can put in these interventions to stave it off.

SHAWN STEVENSON: Yeah. This is one of the things that I've been gracefully working to highlight, because we tend to place this victim mentality on ourselves, and we verify that for other people. And instead of acknowledging how powerful we are, how much agency we have with these conditions... Because, again, you just mentioned, for me it's just like, I learned this from the top person in epigenetics, who really kind of impresses upon culture, Dr. Bruce Lipton. And looking at less than 1% of our epidemics of chronic disease are from true genetic defects. Right? And so now we're looking at even with Alzheimer's, another thing affirming, about 90%, 9 out of 10 these cases, this is not because of genetics, this didn't just happen. And even with that, we can trace back, when we just say something just happens, we're ignoring basic laws of physics. There's a cause and effect for this thing here to be expressed. But 90% right now is the number that we're zooming in on, this is not related to a genetic defect or a genetic predisposition for this thing. It's brought on by the choices that we make. We have so much power.

LOUISA NICOLA: We do have so much power. However, something that I've been talking about often, is, I think the only way forward is through education. So... Education has got to... We've got an abundance of education now, you've got your show, your wonderful show. We've also got Google, albeit there's maybe some wrong things on there too. But we really do have so much free education out there, that can teach us what to do, what not to do, "Hey, alcohol is not good for you, and these are the reasons why." It's very easy. So, it's either the way through is education, and it's also implementation.

SHAWN STEVENSON: Yeah, you just said it. And it's free, it's just...

LOUISA NICOLA: It is, it really is.

SHAWN STEVENSON: It's so crazy to even to be able to say this, but my first year at college, I went to... I would say it was wrongfully expensive private university, by the way. I think the President of the school was dibbling and dabbling with some of that money. But anyways, they were transitioning from computer search for the database of different research aspects to literally, they still had the Dewey decimal system there, like card catalog. I would literally go to the library and I'm looking up for certain resources with these cards, right? This catalog system, when today... And just even that, it's an expensive use of my time versus... If you're listening to this chances, are you have access right in your hand or right within arm's reach to answer just about any question you can come up with, but what are we doing with it? Where often times today we're outsourcing our thinking, like you just mentioned, that modeling is so powerful on how we're shaping our brains. And so, if we're not aware of this, like what are we spending our time with? You said something earlier, and I want to ask you about this. You mentioned energy, right? So, I know that our brains really have this kind of limitless capacity for connection and growth and development, but do we have an allotted energy that might get siphoned by social media or by things that are just kind of pulling our attention away that could be used for other things?

LOUISA NICOLA: Yeah. I was actually reading something quite recently, it's like the latest research when it comes to different disease states, and they brought up something really fascinating. And some of the disease states, which we won't go into, occur in the brain due to the breakdown of mitochondria in the frontal lobe. So, we hear about mitochondria, it's like our little batteries in our cell, they recharge our cell, energy production happens within their ATP, this is where we get our energy from, really. We never think about that in the brain and perspective, even though we have cells evidently and our brain has a cell body which houses mitochondria, so I think about it like that. I think about what are we doing to the mitochondria in our brain and where are we getting our energy from? And to really elucidate this theory, I describe it like this, let's just say you wake up and you've got this entire glass is full of water, okay, that's our brain's energy. Every time you take a sip, that is a thought, okay, so you've just thought about something, that's you've just taken a sip of water, then you go and write an email, maybe you've taken a bigger sip of water, maybe you have an argument with somebody, it requires a lot of mental energy, emotional energy, they've taken another sip of water.

And every time you do anything, big or small, you're taking a sip of that water, and what happens at the end of the day? Sometimes it's happening to us at 2.00 PM, I'm seeing this in my hedge fund managers, they're down here, right at the end of the glass, they've got no water left, because they've taxed all of their energy by doing these tasks during the day. So, then it becomes, well, how can we get better at using less energy to write that email? Or how can we

get better at conducting a meeting with our executive team and using less energy? That comes down to having a better performing brain, and that's what we speak about. So, I do, to answer your question, yes, I do believe that you can... Everybody's brain is different. However much emotions that you attach to a certain task will probably be the defiant of how much energy you produce in that task, but it's also comes down to it's just like your body. Back in my triathlon days, I don't know if you were an athlete of that type, but let's just say I said to you, "Let's go and do a 40-mile ride." It would probably take you a lot more energy to produce that ride than me, because I'm used to it, and I've grown to understand how to utilize energy during that 40-mile ride.

SHAWN STEVENSON: Wow. And also, this brings us full circle to something and I'm so grateful that you lean into this so much in your teaching the people that you're working with, but just also with your show, and you're teaching through different platforms on how powerful sleep is for all of this, because as that glass is getting diminished, how are we refilling the glass that's happening during sleep.

LOUISA NICOLA: Oh, absolutely, and sleep is so wonderful, and I know you've written so much about it, and I'm so thankful for this, you understand what happens during sleep from a hormonal perspective. We've got various IGF-1 that is in testosterone that is being released and these hormones are responsible for protein synthesis. And so, we see why athletes such as a LeBron James may need to sleep 12 hours a night. We see these molecules being released during slow wave sleep or deep sleep, we also see a wonderful process, which I know that you know about, called the glymphatic system that kicks in during N3 stage sleep. We've got four stages of sleep and we start off with; N1, light sleep, it's non-REM sleep, we're going to N2 and then once we reach that deep sleep stage, N3, that's when we get the activation of that wonderful glymphatic system that goes through and it acts as a sewerage system in the brain, and then evidently we move into Stage 4, which is REM sleep, and these processes are... They're there for a reason, mother nature created them for a reason, our brain needs to cycle through these, and if they don't, what are you doing? You are putting yourself at a disservice to your own goals, your everything, you wake up...

If you've had four hours of sleep and you wake up, you're not doing yourself any favors, in the slightest. In fact, let me just draw upon this, there has been many studies out for the relationship between athletic performance and sleep, what we find... They've done endurance and sleep, if you're sleep deprived, an endurance athlete, what you see is that they have less perceived exertion, so they don't feel like they can keep going further during an endurance event. We see shooting accuracy being dysregulated, especially when you've had four or five nights of sleep, the shooting accuracy of a basketball player isn't at its original... At its peak. We see this in sprinting events, so we know that. But what about when it comes to immunity and disease states? Well, like I said, we've got 20,000 genes in the human genome.

There's a study that was published in PNAS, it was 2019, and they took a group of healthy males, okay? So healthy adults, they deprived them of sleep for six hours a night for one week, just one week. Many people listening, if they are living in New York, they're probably like, "Louisa, that's just a normal week for me, I sleep six hours." Guess what they found. So, this is clinical, these are humans. They found that they had an epigenetic change of 3%, meaning that they changed 3% of their entire human genome. If you do the quick calculations, that's around 700 genes that they've changed out of 20,000. And what they found was that half of the genes, okay? Half of the genes that were upregulated were the genes responsible for tumor growth, and the genes responsible for immunity were downregulated. So, if you sleep deprive yourself of six hours or less a night, you are accelerating yourself to death. That's scary and harsh, but when you think about it that way...

SHAWN STEVENSON: Yeah, just going to throw that on us.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: Louisa, thank you.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: But this just goes back to what you just shared earlier, which is, we can under-sleep our way into chronic diseases like Alzheimer's, you mentioned. One of the things, of course, Alzheimer's the last couple of years has been labeled in scientific circles, type 3 diabetes because of the insulin resistance taking place in the brain. But also, one of the things that we've seen is that it's heavily linked to an inability of the brain to properly clean itself, it's glymphatic system, and it's a shout out to the glial cells running that. But for years, even when I was in college and doing training to work in the gym, strength conditioning coach stuff, we were talking about the lymphatic system, and I got it.

I was just like, "Okay, we got this extra-cellular waste management system in your body, you got to move to move it, it doesn't have a pump like your heart, your cardiovascular system." But one of the things that was just kind of... I didn't really make the connection is because I was thinking about the blood-brain barrier like, well, it's different from the top down, well, from the neck down, should I say versus what's happening from the top up. And so, there's science around the glymphatic system, and it's like a little parallel, it's kind of a waste management system for your brain. And some of the numbers, it varies a little bit, but it can be upwards of 10 times more active when you're sleeping. And so, helping the brain to recycle cells to get rid of... There's so much metabolic waste that's just going to happen because there's so much activity, it's like an entire...

LOUISA NICOLA: Ecosystem.

SHAWN STEVENSON: Yeah, and just like this huge galaxy of stuff taking place, and we can send ourselves to this early degeneration simply by not getting adequate sleep. And this leans into this aspect of it, which when you start to mention those different stages, this is not about quantity, like that's... People who tend to get hung up on that, like, "How much sleep should I get?" It's the efficiency of you going into these stages because each one of them is giving specific value, it's just like through our evolution as a species, our body is so smart, it's just like shifting gears to do certain things and everything is working in this harmony and we're creating disharmony when we sleep deprive ourselves, as you mentioned. That study is so fascinating to me because we're talking about a huge... Sleep is a massive epigenetic controller.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: But you're seeing this upregulation of genes for expressions of tumor growth. So, we've got data now on sleep deprivation and cancer. Specifically, one of them was on nurses working the overnight shift and seeing this higher rate of breast cancer. Like, why? Why is that? It's an epigenetic influence. But also, I want to make this point too, because a similar study found this upregulation essentially with genes related to inflammation. And now this is one of those terms that's really catching on, and I'm grateful, but where's the context? Because that inflammation, it's a dry... I think it all can be put under this umbrella of stress, which you said that earlier, we can stress our way into degradation.

LOUISA NICOLA: Yeah, inflammation is really actually quite fascinating to me. So, we're seeing now at the seat, or the start of many disease states is chronic inflammation. When you look at Alzheimer's disease... And so, dementia, I would say is the umbrella term to neurodegenerative diseases such as Alzheimer's disease, because people often ask, "What's the difference?" So, dementia is the umbrella term, and we've got Alzheimer's disease, and we've got many different frontotemporal dementia as well that sits under them. Alzheimer's disease is very fascinating to every human. Every time I put something up about it, there's so much talk about it. It's because it's mysterious. And I mentioned at the start, when you look at the pathology, we have got tau tangles, okay, but we've also got phosphorylated tau proteins.

So, what's interesting about this is, this protein, it's bad when it comes to Alzheimer's disease. However, it is also released as a good response in response to a traumatic insult, so that's where things become really fascinating as it relates to the brain. So, when we're looking at Alzheimer's disease, we know that there is a wing that can be caused by inflammation, there's a leg or a wing, if you will, that's caused by sleeping, how well we're sleeping, sleep deprivation. There is another wing such as insulin resistance. So, there's just so many different facets. I

think there's around six that relate to the pathophysiology of Alzheimer's disease, which makes it extremely scary, very elusive to researchers. And this is why we don't have a cure for it yet. And there's just still so much to learn about this disease.

SHAWN STEVENSON: Yeah. One of the most powerful things that you've said today is, basically creating this 20-year buffer of an onset by consistently exercising.

LOUISA NICOLA: Well, you don't get symptoms. We could all, right now, in the next 20 years, that's when we can start showing signs and symptoms of Alzheimer's disease. And so it starts 20 years before the onset.

SHAWN STEVENSON: When you said that the tau tangles, it reminded me of... So, I'm just going to share this because also, obviously, you know this too. You mentioned alcohol, it's not a health food. It can be put in this category. It's not to say that you can't drink, but we've got enough data now to know how it affects the brain. So, our nutrition and our intake from that modality is important too. But this was from researchers at the University of California, Santa Barbara. Shout out to everybody there. They discovered that phytonutrients in cinnamon can help comb out protein tangles in the brain made of these tau proteins.

LOUISA NICOLA: Is that Ceylon cinnamon to be exact?

SHAWN STEVENSON: So, for me... And that's the one that I use.

LOUISA NICOLA: Okay.

SHAWN STEVENSON: But there's a variety. There's so many different types and what they were identifying. And this is what I was going to say was, there's different phytonutrient combinations and different types, right? So, they found that these neurofibril tangles are actually one of the primary biomarkers of Alzheimer's disease, of course. But not only does cinnamon inhibit these tangles from happening in the first place. It also has been found to reduce oxidative stress and improves the overall health of our neurons. Cool stuff that...

LOUISA NICOLA: That's amazing because I've only really heard about Ceylon cinnamon having an effect on the insulin spikes. And getting those postprandial spikes in glucose. So, I know that for me, if I'm having something that's going to spike my glucose, I immediately have some Ceylon cinnamon. I didn't realize that it had an effect on the neurons and that's probably going to be my reading for my flight home to Australia.

SHAWN STEVENSON: Well, this is actually right from my book, Eat Smarter, shout out to...

LOUISA NICOLA: Wow. Shout out to Eat Smarter.

SHAWN STEVENSON: Shout out to Eat Smarter. And one of the things, even with the cinnamon, one of the compounds... Because that's the thing about us, we're always trying to identify, "What's that small thing?"

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: The small thing is chromium in there.

LOUISA NICOLA: Okay.

SHAWN STEVENSON: As far as the blood sugar. And so, when I found out about this years ago, I'm just like, "Let me tell people to take a chromium supplement when they come in and they're type two diabetic." And yes, it has its place, but let's look at the overall health combination, right? So, it's just... Obviously the nutrition is important, it's what we're making our brain out of, but we cannot negate as you've mentioned, these other inputs for our brain. So, this is one of the gifts of having you here. And I want to circle back to this. This is really special because it tripped me up when you mentioned juggling, like being so good for our brain.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: And just all of these particular benefits. And I was thinking about... I spoke at an event for my friend Jim Kwik had put on. And one of the things he had for everybody at their chair, there was a bag of stuff, was these little balls and he would have people juggle, right.

LOUISA NICOLA: Wow.

SHAWN STEVENSON: He was... We all look like fools up there...

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: Trying to juggle, but if you think about somebody like him, right? Who's an accelerated learning expert.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: Telling us that this activity is going to help to improve your cognitive function. It didn't really land for me then, it's just like, "Okay, you're weird."

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: That's cool.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: Cool, you can do that, but now it's just like, it's really rekindled this concept for me. And so, for the average person again, you gave us a great exercise that we can do for... Just grab a tennis ball and just utilize a wall.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: All you need is tennis ball and a wall.

LOUISA NICOLA: Well, soon we're going to actually be having... We did have neuro balls. We've got specific balls with a little brain on them. So, if you don't want to use a tennis ball, we're going to have those. We're just working on a name.

SHAWN STEVENSON: Neuro balls. I like neuro balls.

LOUISA NICOLA: Okay.

SHAWN STEVENSON: But you got to be careful with anything you put on balls.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: Alright. So, are there any other practical things that folks can do? Because obliviously, for me, when I think of you and digging into your work, I'm looking at Neuro Athletics.

LOUISA NICOLA: Yes.

SHAWN STEVENSON: So, I'm thinking about something physical that I can be doing.

LOUISA NICOLA: Yes.

SHAWN STEVENSON: So, you gave us one thing that is practical, tennis ball or coming soon, neuro balls.

LOUISA NICOLA: Yep.

SHAWN STEVENSON: Some kind of balls and a wall.

LOUISA NICOLA: Yep.

SHAWN STEVENSON: Is there anything else that we can look at doing for the everyday person?

LOUISA NICOLA: Yeah. Actually, this is something that I think is really fascinating. So, like I mentioned earlier, we use strobe goggles where we'll put... They're goggles that you put on an athlete and through technology we black out some of the quadrants of the eye. You can do this with an eye patch and this eye patch, you can go to CVS because I've bought many of them. And if you've ever had an eye infection or something, you you'll get this eye patch, and you may look like a pirate. But wow, it is absolutely fascinating. So, what you can do is, as you are working... This is actually moving into level three. Now I said that like, there is 500 variations, we've also got levels. You're going into level three now of neuro athletics, which involves the vision. You put on one eye patch, and you are blocking out, literally you are making yourself 50% blind.

And so, you think, how hard does your brain have to work to keep doing the tasks that you were doing? So, it's like doing weights for your brain. So, when we say neuro athletics, it's how can we have an athletic brain? And so, you can do this. It's very easy. You can even, before these eye patches were out, I remember back in 2014, I was literally putting tea towels on my athletes. I've actually got a video of a tea towel on one of my fighters because we ran out of eye patches. Something so easy and so simple or you can just cover your eye with your right hand and throw the ball to the wall with your left hand. That's one way. We have this game as well that we play, where we have lined up on a wall, different colors.

Let's just say you go and get 50 different colors, all different shades, and as they're hitting the ball, maybe they're bouncing it to the ground. By the way, you don't just have to hit the ball to the wall, you can bounce it to the ground, okay? One, you can bounce the ball to the ground with your right hand and throw the ball to the wall with your left hand, that's incredibly in... It's very mentally taxing. But let's imagine it, okay? You've got one ball and you're bouncing it to the ground, and we're getting the athlete to talk about all the colors, red, blue, light blue, yellow, beige, and we're doing this on and on and on, this is actually working different areas of the brain, we've got different areas responsible for fluency and language, and so this is attacking that area of the brain. Whilst also maintaining focus whilst also maintaining how many times he's hitting the ball to the ground.

Whilst also doing this under time, so is creating a lot of neuro pressure. So, our workouts only go for no longer than 20 minutes. If we do this longer, it will completely tax your brain and that's not what we want. We have a pre-game warm-up with some of our athletes, so that's what I actually mean... I will go into... I've got a lot of NBA athletes and before a game, I'll go backstage where the... Where their locker room is and I'm doing these drills with them before they go on this... Before they go on the court, I keep wanting to say stage, but it's... Yeah.

SHAWN STEVENSON: That's so cool. Thank you for that, because again, these are accessible, like you said, CVS, now we're going to get this huge run of eye patches out there in the market, the same thing with tennis balls, and we don't even have like...

LOUISA NICOLA: And we going to have neuro packets seems like.

SHAWN STEVENSON: Yeah. Oh, that'll be great. With the eye patch with something cool on it.

LOUISA NICOLA: You'll have like a brain on there, we'll have our logo, we'll have some neuro balls.

SHAWN STEVENSON: There's only like two cool eye-patched people, you mentioned pirates and then Nick fury shout out to Nick Fury.

LOUISA NICOLA: Yeah, yeah.

SHAWN STEVENSON: So, wow, so cool. And yeah, these are just very practical things that we can implement, and again, I think there's a level of creativity to it all, and just finding creative ways to stimulate our brain to move and wow its super fascinating, yeah. One of the most important things that you talk about is having a framework for achieving peak mental and physical performance. So, what do you mean by that?

LOUISA NICOLA: Well, it's like, do you want to wake up and be completely blinded by your efforts that you put in the day, or do you want to have an actual framework to achieve this peak mental performance. And the framework looks like this, I mentioned it earlier, we work in three domains. We need to look at the nutritional domain, nutrients for the brain and the nervous system, that is one entire column that we want to look at, that's one framework. The next framework to building a high-performing brain is the exercise domain, what are you doing for exercise? Okay, and we can talk about that. And then the third thing will be the sleep component, and the neurophysiology component. So, I believe that you can't optimize what you don't measure. So how does an athlete know... We're not personal trainers, okay? So, you can't see the physical results, it's not like if you get a better brain, you're going to lose weight. So how do they see if they're getting a better performing brain? Well, we first start with blood

work, we do a very... Some of it is... Some people are doing 20 vials of blood, okay? We're doing about 100 different biomarkers that we're testing, we're doing a genetic test as well, so we're testing their genes and we outsource all of this evidently.

So, we're able to have a baseline and then we also do the brain scan. We've got a baseline here at the bottom of the pyramid, and then we can start putting these interventions in which takes around three to six months to have an effect. So, then we say, okay, great, according to your profile, we're going to put this intervention when it comes to nutrition into place. We're going to also dose you up on maybe two or four grams of EPA DHA per day, we're going to get you some magnesium, if you're... They do a mineral test as well, you're deficient in this. We do a sweat test for our athletes as well, we test before they go on the field or the court, when they come off how many electrolytes have you lost, like what are you losing on an average, so we can replenish those pre-game, mid-game, post-game. And then we go into the exercise world. So, when it comes to the studies on resistance training and brain aging, there's a lot... It still a bit murky the waters there, but you want to be aiming at doing 70% of your one repetition max, three times a week, when it comes to resistance training, right? To have these effects, we also want to be doing obviously various kinds of endurance training, anaerobic physical activity. Within that exercise domain you also got neuro-motor which is neuro athletics every day.

Your framework should be, "I'm going to just do five minutes of ball work, Louisa says to throw the ball to the wall for five minutes per day." Time yourself, get creative, see how long you can do without dropping the ball, write it down on a piece of paper. The next day maybe do two minutes and 20 seconds. So just keep doing that. But you've got to have that neuro athletics training in that, okay? Then what's your framework for sleep, first of all, what do you do for your living, are you a shift worker, are you nine to five workers? When should you start winding down, what is your sleep environment look like? Is it...? Do you have black out curtains? Do you sleep with another person? Do you have a... Are you a hot sleeper at night? Do you toss and turn? We also do a lot of sleep studies, so if we have patients who are like, "Well, I'm just not... So, I feel like I'm waking up at 4:00 AM every morning." We send them to go get an in-lab sleep study. So, this is the framework I'm talking about, you have to wake up and know what you're doing and why you're doing it. When it comes to the brain and the body, it has to be very deliberate, nothing should be done by chance.

SHAWN STEVENSON: I love it, I love it. Without... You said you can't manage what you don't measure, so being able to create a structure, an intentional structure for ourselves.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: Based on our lives is essential, because again, I think that a lot of times we're just kind of whimsical, going with the flow, doing it, and there of course is room for flexibility, the whole thing, but at the end of the day, we need to have a structure for ourselves and operate within that structure.

LOUISA NICOLA: And everybody is different, it's based upon your expectations and your goals. For example, are you a baseball fan?

SHAWN STEVENSON: I am but I have to...

LOUISA NICOLA: Okay.

SHAWN STEVENSON: I have to temper myself.

LOUISA NICOLA: Wow. Okay.

SHAWN STEVENSON: Because I'm a bit obsessive.

LOUISA NICOLA: Who's your team?

SHAWN STEVENSON: I'm from St. Louis, so it's the Cardinals, you know...

LOUISA NICOLA: Wow. Okay.

SHAWN STEVENSON: Shout out to the Redbirds.

LOUISA NICOLA: So last night I went to my first ever Dodger's game, and I was sitting in the front row, so I got a very great experience. And what I saw was, I saw these athletes, or you know... He'd go up and he'd go to... He's the batter. My literacy when it comes to baseball isn't the best, but he'd go to bat, and let's just say, I saw the pitcher he'd throw the ball and then the guy would take a swing, so he'd miss. I'd think, "Why did he miss that?" When it comes to vision in sports, they say that baseball has... Or Major League Baseball players have the best vision in out of all athletes, okay? So, they've got greater than 20/20, I think a lot of them, and the greatest ever recorded in MLB was 20/12, so that's fantastic vision, but why is he... Why is he swinging like 0.2 seconds? So, we would put a framework into place for him to improve his reaction time to swinging and hitting the ball. So, his framework will be completely different to somebody who is... My father, for example, who... You know he had a... He had an ischemic stroke three years ago, very small, in fact, in the parietal lobe, he would be operating it on... Under a very different framework, than what this Major League Baseball player would be.

SHAWN STEVENSON: What I'm really hearing though, at the end of the day, it's just like this what we call... We would call superhuman potential, but this is like within us, so much possibility in progress, and so take in these incredible athletes with the best vision that you just mentioned and implementing things that helps that extra 1%.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: Extra 2% can create an entire different, entirely different stratosphere of results to come you know as we understand our amazing brains better.

LOUISA NICOLA: In saying that, imagine the average person. I am the average person; I'm not operating at that level. If I can just work on my brain and I can see a change of 3% in my life, that would still be huge, we're not talking about the small 0.5 or 0.2%. For an average person, if you can change the way that you think, the way that you operate you can change the trajectory of your entire life.

SHAWN STEVENSON: Awesome.

LOUISA NICOLA: And if you really remember as a closing... As a closing statement, that everything is brain first, the brain will always come first, it's neural first. Then that should set you up for a lifelong learning process to understand your brain, how it operates, and what is the best framework to be working under.

SHAWN STEVENSON: You are amazing, thank you so much for coming by and hanging out with us, and listen, again, I'm so excited about connecting with you more, and I think the work that you're doing is... It's just game-changing, and I'm so grateful that you had the audacity when you were in college to be like, you know, I'm going to make my thesis around this, and then not just that, but then to have your career to follow that and extrapolate that out to the world and just again, I think that we are... We're just scratching the surface on what we are capable of... And part of that, you know, this revolution, because also I think that there's this dichotomy, there's this kind of two trains that humanity is jumping on. It's just like we've got this bullet train of degeneration and disease. And we've got another train simultaneously of like advanced performance and longevity. And it's just like we all have the opportunity to choose which one we're going to get a ticket for. And eventually though, like I think one of these trains is going to win out and be the dominant culture, and you're a part of that truly. And I see it and I'm just grateful for you, thank you.

LOUISA NICOLA: And likewise, I'm grateful for you and everything that you put out. So, thank you for having me on your wonderful show.

SHAWN STEVENSON: Can you let everybody know where to connect with you to get more information, to follow you? All the good stuff.

LOUISA NICOLA: Yes, you can, you know, it's very easy, just go to my Instagram, Louisa Nicola and in the link in my bio, it has access to everything. We have a wonderful newsletter that goes out twice a week, it's a free newsletter, and it's all about breaking down the scientific and medical practices that you know... Need to know to perform at your peak. So, take a look at that.

SHAWN STEVENSON: There it is, thank you so much.

LOUISA NICOLA: Thank you.

SHAWN STEVENSON: Louisa Nicola everybody. Thank you so much for tuning in to the show today. I hope you got a lot of value out of this episode; this is one to share out with your friends and family. You could send directly from the podcast app that you are listening on. And of course, you can take a screenshot of the episode and share it up on Instagram and tag me. I'm @Shawnmodel and tag Louisa as well and let everybody know what you thought of this episode. Definitely some powerhouse stuff here. And listen, we've got some epic shows coming your way very soon, some game-changing world-leading experts, and also some powerful master classes that you don't want to miss. Alright, so I appreciate you so much for tuning in to the show today. Take care. Have an amazing day and I'll talk with you soon?

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