THE MODEL HEALTH SHOW

EPISODE 904

Can Bigger Muscles Give You A Bigger Brain?

With Guest Louisa Nicola

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SHAWN STEVENSON: Today you're going to discover how getting bigger muscles can help you to get a bigger brain. Now there are specific muscles to target in particular, and the science on this is incredible. You're also going to discover how video games can impact our cognitive health. Now, there's a specific video game that might conjure up some nostalgia for many of us that's actually been found to have some benefits when it comes to having a healthy brain, in particular healthy brain aging. Plus, you're gonna learn the latest research on one of the most remarkable nutrients ever discovered for brain health and cognitive function. All this and so much more with our special guest, neuroscientists Louisa Nicola. Louisa Nicola is a neurophysiologist global educator and the founder of Neuro Athletics.

Louisa is at the cutting edge of modern neurosurgery, specializing in the neurophysiology of brain tumors, neuroplastic surgical techniques. Alzheimer's disease prevention and the science behind brain optimization. Her ultimate mission is to create a world free from Alzheimer's disease. Louisa graduated from the University of Sydney Medical School where her doctoral focus was in neurophysiology, spotlighting lifestyle interventions and defense against neurodegeneration. After relocating to New York, she advanced her research career by working alongside world class neuroscientists with a particular emphasis on the role of exercise and nutrition in recovery and brain health. You're about to discover the incredible connection between specific muscles and brain health, the role of video games and cognitive function, and so much more with the one and only Louisa Nicola.

Louisa Nicola, what's the connection between our leg muscles and our brains?

LOUISA NICOLA: Oh my gosh. When you hear this, you're probably going to freak out. So there is now evidence in humans that the larger the leg muscle, the bigger the brain. And this fascinates me, right? Because we've always had an understanding that strength and muscle mass correlates to a longer life and a bigger brain, right?

But there was a twin study done on women, so identical twins. And what they found was that one of the twins who had greater leg power and leg strength had a larger hippocampus, which is an area in the brain, involved in memory formation and had better cognitive

functions such as fluid intelligence. So when you look deeply into this, you think, well, why is that?

And that's because greater muscle mass and greater strength is helping you with insulin sensitivity, which you know this, right? That's the back end of it, right? Like why do we want bigger muscles? It helps with insulin sensitivity, it helps with metabolic health, so staving you off metabolic dysfunction. And, then there's also the other aspect, which is, you can actually help the synaptic plasticity in your brain via going to the gym and working out.

SHAWN STEVENSON: Mm. So can you talk a little bit more about what plasticity is?

LOUISA NICOLA: Yeah. So our brain houses around a hundred billion neurons, right? And that's a, that's very big. Right? And every single neuron, which is a nerve cell, is connected. There's around 10 to 15,000 connections per neuron.

SHAWN STEVENSON: Mm.

LOUISA NICOLA: So there's a lot happening in your brain, right? So they all connect to one to one another, and as we age, unfortunately the connections end up dying off. They die off. When we go through neurodegeneration, for example, actually one of the main causes of neurodegeneration is synaptic loss. That's when the synapses tend to lose, and that's how you actually get atrophying of the brain. If you hear that somebody has brain shrinkage, it's generally because the connections between the brain cells are shrinking or dying off. So when we talk about synaptic plasticity or neuroplasticity, that's the brain's ability to rewire itself.

So if you perform a specific task over and over again, your brain creates these highways, right? So different neurons connect with one another, they create these highways, which makes it easier to perform that task again. But when we are engaging in exercise, whether it's running, so whether it's doing aerobic activity, resistance training, we're creating greater connections between these nerve cells. And what ends up happening then? Well, we have a thicker brain, thicker cortex. Better ability to think, to move and to age better.

SHAWN STEVENSON: That's powerful.

LOUISA NICOLA: So in this twin study, which was printed in the Journal of Gerontology, yeah, it definitely showed that leg power was attributable to greater brain health. But here's the difference. Notice I said power. So we've known for long that strength is correlated to longevity, right? So the stronger you are, the better you will be able to stand up, move around, and not succumb to a fall in your eighties, right? But leg power or power as a whole doesn't get that much attention. So power, when we're talking about from muscular power, is strength times speed. So what does that mean? It means that explosiveness, right? So your ability to do it's, it's usually tested via a vertical jump. So in this study specifically, they showed that both power and speed, power and strength was correlated to a bigger brain.

SHAWN STEVENSON: Oh my goodness. I love the specificity on that.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: Because again, we think, okay, well first of all, you shared that regardless of the type of exercise, it's gonna be supportive of good brain health. But there are certain inputs that are especially valuable. And so working our leg muscles and minding strength and also power, and we're gonna get more into like what are the best practices. But I want to ask you a little bit more about this because with muscle, you mentioned the insulin sensitivity factor.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: And the connection there with the brain, but also what about muscle's capacity itself to kind of function as an endocrine organ or an organ that's producing chemistry itself? Let's talk about that part.

LOUISA NICOLA: Exactly. And that's part of the journey. You know, I think that we all see, okay, yeah, just grow bigger muscles. It's not just about the end stage, like increases in muscle size hypertrophy, it's what's the journey of getting there? So every time we go to the gym

and we're engaging in resistance training, what we're doing is with every contraction of your muscle cells, we release myokines.

And that's what makes it an endocrine organ, because myokines are hormones, they're muscle based proteins, but they're also hormones. And you know, we can name about 12 right now. We've got irisin, we've got Kasum B, Myostatin, and what these BDNF, which is the most prolific one. What these myokines do is once they're released from the muscle cell. Right, and this happens under force. I wanna be really clear with that because there's so many women that are lifting what we call pink weights. You know, one pound, two pound weights that are not doing anything. You have to generate enough mechanical force and tension for your muscles to release these myokines.

That's the only place they live. These myokines live in the cells of the muscles. So when we contract our muscles and we release these myokines, they go into the bloodstream and they travel, and we've got receptors, right? We've got receptors all over our body. We've got them in our brain, on our liver, prostate, ovaries, everywhere. And if you imagine receptors and hormones as a key and lock, the receptor is open and the hormone is the key. You put it in, it unlocks amazing things. So these myokines, when they go up in the bloodstream, some of them can cross the blood-brain barrier. Irisin, for example, that's one of the myokines that is like a messenger molecule.

And when it goes into the brain, that's exactly what it does, and it binds to these different receptors and it helps with different functions of the brain. We have to remember every lobe of the brain is responsible for something different. You've got the frontal lobe, which houses the prefrontal cortex. Then we've got the cerebellum, which is the mini brain, which is involved in posture, coordination, spatial awareness. You've got the temporal lobes, which auditory processing, but also house the hippocampus. So it's enabling them to function better and at their peak, just think about it the same as how you would work out your legs in different areas.

You've got your quads, you've got your hamstrings. You can think about your brain like that. So these molecules, when you are placing your muscles under stress, can act as the pharmacy

releasing all of these little drugs that go into your brain and have positive effects, but not just that. They can also travel to different areas of the body.

Right. I mentioned prostate and this is fantastic 'cause I'm now looking a lot into the research of resistance training on cancer mortality. And I actually just posted yesterday a phenomenal article that showed that. I think it was around a 30% cancer reduction and cancer recurrence in colorectal cancer just by doing aerobic activity and resistance training. And this is all comes down to the myokine release. So these myokines can go into different areas involved in, you know, tumor progression and shrink the tumors.

SHAWN STEVENSON: That's so powerful. Listen, every time we look at something it related to exercise and human health and survivability, we keep finding benefits. And this is something that, you know, modern science is affirming, but it's coming at a time. We're so inactive. Right? We're becoming more and more sedentary and it's just finding that we're becoming essentially less human in a way. Oh yeah. And what our genes are expecting of us. And so finding all these benefits of exercise and some of the capacities that we need to be mindful of as we're getting older.

And so I want to ask you about some specifics for building that power. If we're looking to get this benefit, we want a thick brain. We want a bigger brain, a robust brain, great plasticity. What are some of the best practices, right? You mentioned the pink weight phenomenon. That's not gonna be what we're looking at if we're looking for power. So what are some of the things that we need to be doing?

LOUISA NICOLA: Well since power is the production of speed and strength. We have to work on both of those. So when we're looking at explosive power, we are really looking at how much force can you generate in the fastest amount of time. So it could involve doing a jump squat, for example, with a load.And by the way, you have to be really cautious on your, your joints. Right. I actually, I actually performed these tasks in January and I did my MCL and my, my LCL. So you don't wanna be doing these with, you know, any type of plyometrics with weights unless you're really conditioned to do so. But you can do them without weights, right.

There's really great evidence to actually show that if you do 20 jumps, and this goes into females who are going through this perimenopausal, menopausal phase in their life. If you just perform 20 jumps on the spot, not loaded, you can actually have an effect on your bone mass and bone density. And that's involved in explosive training as well.So anything that's really gonna get you to push a heavy load in a shortest amount of time is what we're talking about here.

SHAWN STEVENSON: Yeah, I, I love this because there's progressions for everybody. So having a good on-ramp is just getting physical literacy with body weight, you know, your body weight squats. And then you can progress to some jump squats without any additional load. Your body is a load, you know? And in particular, you mentioned jumping. There's so much data on this now, and just looking at functionality in older age if people are able to jump.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: And so not losing that capacity.

LOUISA NICOLA: And walking downstairs as well. So a really great exercise is, you know, a box jump, right? Or a vertical jump where you're putting a box up and you're jumping. By the way, it is so hard to do as you get older. I remember being young and I was able to jump really high on a box, and because I've stopped doing that. Obviously now there's this, it's like kind of frightening to jump on. I don't know what it is. You run and then you go to do it, but you stop. I don't know if that's a function of older age.

SHAWN STEVENSON: Yeah, your brain is like, hold up.

LOUISA NICOLA: Yeah, hold up. You're gonna, you're gonna snap your legs. So I've actually created a task for myself and it's one jump a day and if I can do one box jump a day, that's it. I feel like I won't. Atrophy in that area, and I've been doing it so box jumps, but also getting up on the box and then jumping down. You know, helping with that acceleration and deceleration, which is something that we need as we're getting older. I watch my parents. Right.

We've probably both got, well we've got aging parents, a lot of people listening, and what we find is that I look at my parents and I see them going down steps and I always think, oh my God, I'm just, I pray to God that you know that they have enough strength to hold themselves or grab onto something as they're going down the steps if something was to occur.

SHAWN STEVENSON: Yeah. Stairs are phenomenal for so many things. Even that action of going up the stairs, it is gonna elicit like the development of like a better VO2 max faster because of that elevation. It's basically like doing little mini one leg squat each time, and you're going up and obviously coming down as well because of what it requires. It's kind of like there's a big explosion of people training going backwards.

LOUISA NICOLA: Yep.

SHAWN STEVENSON: And doing the backwards sled and all these things. And it's just like that reverse action, you know, lowering yourself and, you know, just finding yourself a flight of stairs, even if it's at home, you know, and, and just kind of engaging with that a few times a week. But I love this with the, with the box jump because you said it. It's a thing if you stop doing it. And that's usually what happens for us over time is, you know, our, our adult selves, like we stop playing, we stop jumping and we'll get what I know. What I found myself doing for a time was doing the big stuff, like doing the most important thing.

I'm going, I'm strength training, I'm walking. You know, all these other things kind of get moved to the side, but just getting little sprinkles of it can help you to maintain that capacity. And so, and a great exercise, one of the things that I do now recently, so if I'm doing like a jump, I'll find some stairs, like maybe five stairs, like in the front of my house, for example. And I'll jump up four, you know, like a box jump style. Ill jump up four and then I'll jump one with both my feet together.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: So it's like, boom, boom. Like a quick, you know, and then.

LOUISA NICOLA: And even that's going to stimulate osteoblasts

SHAWN STEVENSON: That's right.

LOUISA NICOLA: The bones. Yep.

SHAWN STEVENSON: And then coming down. So I'll just, I'll another, this is a different exercise. I'll stand at the bottom step. I'll step down, then I'll jump straight up. So it's just, and you can do this with a bench, you know, at the gym. You just step down off the bench and then go right into a jump. There's all kinds of cool and interesting ways you can do this and engage your, this kind of muscle mind connection, muscle brain connection, but most importantly, get some jumps in. One of my favorite things to do is jump rope.

LOUISA NICOLA: Exactly. I've seen you do that. Yeah. Jump rope actually is, you know, when you look at this study specifically on how to train the participants were doing jump rope as well. So anything that involves literally just getting your feet up off the ground, and it doesn't have to be high. You can just, you can, and for the jumps, especially for women, if you can jump on the spot 20 times, do that twice a day, doesn't involve anything. You can do it in your bedroom if you have to. You are stimulating the cells and the receptors of your bone to create new bone cells. One of the symptoms of menopause and perimenopause that occurs, and this is why osteoporosis is so detrimental for women.

SHAWN STEVENSON: Yeah, super easy access. Jump rope, inexpensive. Doing some basic jumps. Yeah, basic skips and again, progressions. We can, instead of like the small jumps, you can jump higher. Right. It's just a timing thing and single leg jumps. Super valuable. If, again, if we're talking about that leg power and being able to perform with one leg, but these are all progressions.

The thing that keeps jumping into my mind that I wanna share and thinking about the capacity to jump is just even finding the curb outside and just doing a mini box jump, just jumping up onto the curb if you're starting from scratch, you know. And just, and I, and I, I can understand that hesitation if you haven't been jumping. So just find something small or you know, again, just use your body weight, just jump right in place and you'll start to build that capacity, the confidence to do more.

LOUISA NICOLA: Yeah. I ask myself often. Right. Why is it so hard for people to really understand the benefits of resistance training? It's hard, right? And I get that as you get older, you've got more and more responsibilities where whether it's kids, whether it's work, whether household chores, I get, it gets really difficult. Right? I understand that. And then I think about what I know about the brain and. Unfortunately we can't see the brain, but we can see the symptoms and the symptoms show up in things that you can think that you can mask with a pharmaceutical drug, for example, a headache, or not remembering somebody's name or agitation, irritability.

These all come from somewhere and as our brain atrophies just due to the natural brain aging process, right. These symptoms start occurring and my brain can atrophy at a different rate to yours and in different areas. So my symptoms might show up in different ways. We were talking earlier about the visual system, you know, more and more people are becoming, I think you mentioned shortsighted. And we are getting more. Visual impairments as we get older. Why might that be? Is it a function of not going outside and not seeing nature enough? Or is it a function of the back of your brain, the occipital lobe that's not functioning properly as a result of not working out and not boosting the amount of blood flow that goes to your brain?

SHAWN STEVENSON: Yeah. You mentioned the cerebellum earlier.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: And just it's a, that's a substantial part of the human brain.

LOUISA NICOLA: Oh yeah.

SHAWN STEVENSON: And so much of that is involved in movement. And it just tells you like the way that we evolved and how important movement is for survivability.

LOUISA NICOLA: Yep.

SHAWN STEVENSON: Right? Like it's not just, we're not just these kind of cognitive centered creatures. We are movement centric creatures, you know, and they really go hand in hand. And so we're able to feed that with what you're sharing with us. And so I want to ask you about this as well. So being that we are looking to train power. You mentioned strength times speed.

LOUISA NICOLA: Yep.

SHAWN STEVENSON: So what about strength training exercises and just approaching them differently. So like maybe we're doing some squats and we, not necessarily jump squats, but just like trying to move the weight a little bit faster, maybe, single leg squats. These Bulgarian split squats are hot on the streets now. It's been around for decades. But, what about that?

LOUISA NICOLA: Oh, they're amazing. Yeah. So I wouldn't just go to the gym and do exclusively power. You're gonna burn yourself out. You need, it's a function of strength and speed, right? So you need the strength there. So you need to be lifting heavy now. It's funny. There is so much, this is consensus around, do I lift? You know, three reps with really, really heavy weights, or do I lift six to eight reps? And the way that I love to refer to this is lift until you've got two reps in reserve. That means. Whether you have to do eight reps or six reps, just make sure that you have, that you have two left until you go to absolute failure. So you don't wanna go to absolute failure in every single set, right? You wanna get to two reps in reserve.

That's what I've been deemed to know after interviewing some of the best people in that field. So you wanna be working out? And you always want to be doing compound movements, and I think that we need to move away from looking at just training quads at the gym, right? Because again, that means you have to be in the gym. Seven days a week, because you are working on different muscle groups, you can have a significant impact on your muscle mass and strength if you're lifting three times a week, resistance training. So what would that look like? Well, I would recommend focusing on compound movements, whether it's your deadlift, whether it's your split squats, as you mentioned, Bulgarian split squats. I love RDL's. I love doing anything that's working on my glutes, of course, doing like weighted squats at all

times. And then next day doing upper body movement. And then if you want to right at the end of your workout, incorporating some of the explosive movements.

SHAWN STEVENSON: Hmm, I love this. And, you know the women listening, they're not gonna have any problem with this whatsoever. You know, leg day is, is not a, not an issue. But I think it's going to for, for guys. And that's changed also recently, like a lot more guys are about that life when it comes to leg day really. But there's still a lag with the fellas because we tend to be more upper body focused, but just to, you know, make sure that we're getting those inputs. And also this doesn't negate the value of training your whole body as well. So we're focused again on the data. Indicating with legs and the power there, it's just our legs are such an important mover of life. Right. And so I could see that connection, but making sure we have a strong upper body pushing, pulling in different ways. And I think just the act of training and novel experiences, and challenging ourselves. I think all this stuff is good for our brain too.

LOUISA NICOLA: Novelty is fantastic, and the more that you do the same thing over and over, the worse your brain is. I'll tell you something. If you want to age somebody fast, if you want somebody to get Alzheimer's disease. If you really want to age their brain, get them doing the same thing every day, hanging out with the same people every day, not challenging themselves, not placing their body under load, not placing their bones under mechanical stress, not placing their heart under any stress. Get them to do that over and over again, and you will see they will age extremely fast.

SHAWN STEVENSON: Mm mm mm. Just gonna let that sit for a minute. Got a quick break coming up. We'll be right back.

Summer is here and it's time for some summer fun. Sun's out, guns out, or buns out. However you want to slice and dice it. It's time to get out there and enjoy life and enjoy fitness. Now, as you know, especially when it's hotter outside and you're sweating, you need to make sure that you are staying optimally hydrated and making sure that you're getting in adequate amounts of electrolytes. Electrolytes are key minerals that carry an electric charge that enable your body to do all the stuff that your body does. Whether this is your heart beating,

your brain functioning, your muscles moving, everything that's going on in your body, electrolytes are required to do those jobs. Three of the most critical electrolytes that you need to target, sodium, potassium, and magnesium.

There's a sodium potassium pump that's behind pretty much all of our cellular processes. And the energy that our cells are making via the mitochondria is deeply dependent on not just the sodium potassium pump, but magnesium to be present in order to actually make new mitochondria. The bottom line is for optimal physical performance and cognitive performance, we've gotta make sure that we're being proactive in getting ourselves hydrated and utilizing the very best electrolytes possible. Number one, get plenty of electrolytes through eating real foods. It's super important, but also this is a great place to supplement. But when you do that, you wanna make sure that you're getting the number one clean electrolyte supplement in the world. It has no sugar, no artificial dyes and results that you really notice.

And right now, just in time for summer, the number one electrolyte supplement in the world from LMNT has a brand new lemonade salt that you're absolutely going to love. Now, this is for a limited time, so take action on this right now. And of course, with every purchase, you're also going to get a free sample pack where now you're gonna get to try out two packets of each of their four most popular drink mixed flavors. It's amazing and as always, element has a no questions money back guarantee, so you have nothing to lose and only better hydration and performance to gain. Go to drinkLMNT.com/model. Right now to take advantage of this, that's drinkLMNT.com/model and hook yourself up for this summertime special. Again, try out their limited time you get to try out their brand new lemonade salt plus that incredible free sample pack. Head over to drinkLMNT.com/model and now back to the show.

SHAWN STEVENSON: Something challenging that we have access to today, which I wanna ask you about. And there's a lot of negative perspective about this particular experience, but there's emerging science on some benefits with this, and it's a way that we can change ourselves and we find a lot of novelty and we find a lot of achievement and challenge is video games.

LOUISA NICOLA: Oh gosh.

SHAWN STEVENSON: Right? You've got some new information. About the connection between playing video games and our brains. Let's dig in and talk about this.

LOUISA NICOLA: So it turns out that Super Mario can grow your brain.

SHAWN STEVENSON: Mm.

LOUISA NICOLA: So there was a, a really great study that piqued my interest because of neuro athletics, and it showed that participants who were engaging in video games, like Super Mario actually had a bigger prefrontal cortex and frontal lobe after playing this game for several hours a day. I don't advocate for sitting in one spot playing this, but it was actually fascinating. So what they found was that the participants who were playing Super Mario grew certain aspects of their brain involved in a spatial awareness, particularly the cerebellum. Okay. Involved in balance and posture and coordination, but also the parietal lobe and that sits behind the frontal lobe.

And that, and when I looked into it, you actually see the MRI and FMRI studies, which showed the thickness of these areas of the brain. So when you look deeper into and you think about, well, what's the mechanism of action? What is happening here? First of all, novelty. Okay? They have to navigate complex tasks. Even though you're staring at a screen, it can be very stressful and demanding on different areas of the brain. Which way do I turn? You also time under tension, right? Because you have to get there, you have to get to the end of the road in a certain amount of time. You're trying to beat other people. So there's a competitive nature to it as well.

Then you are weaving through a different maze. I'm not really great on the nomenclature of this of video games, but I can only imagine that you're going through some sort of road, right? So how to navigate through that and it's also got reaction time. Involved in it, which is another function of the prefrontal cortex.

This is something that atrophies as we get older, our ability to react in a shortened amount of time is becomes dysfunctional. So as we get older, we start to react in a greater, greater length of time. So we're getting dysfunctions in that area. And then it's hand eye coordination as well, which I know you and I have covered many times. So all of these four aspects. When trained and when placed, under pressure grows new areas of the brain. I wanna really point out, and I always say this, neurogenesis does not exist in adults. You cannot grow new brain cells outside of the hippocampus. The hippocampus, which is that seahorse shaped structure that we're talking about.

That atrophies, that gets smaller, that shrinks as we get older. We can grow new brain cells just within that area, even up to 20%. But we can't grow new brain cells in the brain. So when I say thicker brain, I'm not saying that we are growing new brain cells. We are growing. More connections between these brain cells and that is done via exercise and evidently from Super Mario Brothers.

SHAWN STEVENSON: Oh, this is awesome. Now, I know you don't know this because you know, this is something that we grew up with, you know, just part of the culture. Super Mario Brothers. It came with the Nintendo of the original Super Mario Brothers. But there's this power up that you get once you get a mushroom. There's this like mushroom bowl float around.

LOUISA NICOLA: Oh yeah, yeah.

SHAWN STEVENSON: And you get bigger and stronger. And it's like a good analogy for what happens with your brain as well. And you know, again, I love the, just giving a caveat, right? We're not advocating to sit there for hours upon hours and play video games, but getting this input, there's crossover, there's multiple studies on this now. Between playing video games and being more successful as a surgeon. Right. Be playing, playing video games and being more successful as an athlete. Right. There's this interesting crossover that's taking place and it really has a lot to do with the brain and what's taking place in the brain. The hand-eye coordination, as you mentioned.

LOUISA NICOLA: Yeah. But the thing is you have to place your brain under. If I was to place Super Mario Brothers with somebody who was really, maybe a 15-year-old boy, it would stress me out. But that stress there is good, that stress is good. When that good stress is placed on our brain, that's what enables it to grow. Where it becomes a waste of time is when you're doing it over and over again. And you're doing the same roads and you're not going to the different levels. Actually, that was another part of the, part of the study.

It was the fact that they achieved level one. Okay, now they're going to level two, and level two is much harder. You have to go through a tougher road, for example. So it's about novelty, but also about stress. And so many people are still trying to get out of this because they are playing Sudoku, for example. Again sudoku could help you with neuroplasticity and help you with your brain as you get older. But if it's easy for you and it's not placing you under any stress, it's probably not gonna be beneficial.

SHAWN STEVENSON: Hmm. So we're looking for that hormetic stress.

LOUISA NICOLA: Hormetic stress. Yeah.

SHAWN STEVENSON: Looking for that good stress input. That's the Mario music.

LOUISA NICOLA: There is also, in the same realm, there's also a growing body of evidence to show that seeing novel places, right, traveling. Looking at different like architecture for example, can have the same effects with improving spatial awareness. Improving the visual cortex because you're looking at a new building, you're looking at the way it's shaped, going to art galleries, things that, seeing different colors, seeing different shapes and sizes and different photos. All of these novel experiences is new to your brain and your brain is like, wow, look at that color. I haven't seen that color in a long time. So it lights up a different area in the brain that hasn't been used probably since primary school.

SHAWN STEVENSON: Hmm. Yeah. I remember this was like, I'm guessing maybe like seven years ago I did an episode of the show. It's just like a masterclass and some interesting things that people we, we might not think about associated with longevity and one of them was

travel. Right. And I was like. Because again, coming from the environment I come from, I didn't get on a plane until I was 25.

LOUISA NICOLA: Wow.

SHAWN STEVENSON: It was the first time I got on a plane and it was my wife, it was her nudging me, you know, she's my girlfriend at the time, like, you haven't been anywhere, we're going, you know?

LOUISA NICOLA: Oh, that's so nice.

SHAWN STEVENSON: So she got me out of that environment and I didn't really have any aspirations to leave. And I just see this again in the environment, this slow degradation, you know, we're just kind of really inundated with a certain environment that we're in, and it's so important to see new things to experience new things. And we can find that at home. We can find that in our, in our day-to-day environment. But you have to proactively turn on this sense of awe and look for those small things. It's just easier if you go to a new environment, if you explore, if you get out of your daily routine. You just said one of the most powerful things you've shared is just like if you want to guarantee your path to neurodegeneration and dementia, then keep doing the same thing again and again and again. And not challenging yourself and getting your brain exposed to new things because the brain is always looking for automation. You know, it automates that stuff.

LOUISA NICOLA: Easiest thing.

SHAWN STEVENSON: So it can expand and focus on new things. And that's what keeps our brains young.

LOUISA NICOLA: Actually, one of the biggest studies ever done on memory was on New York City taxi drivers, and it showed that they had a greater ability to remember. And they had better me, better memory as they aged because they had to memorize the New York City, all of Manhattan. Right. And that is crazy being able to navigate that.

That crazy city, but it comes back to spatial awareness, comes back to navigation and doing complex tasks.

SHAWN STEVENSON: We need to get a special episode of Jeopardy with New York Taxi drivers. You know the taxi series, that's just amazing because again, you just think about, and also the stress as well, navigating those environments, so matching those things up. The need, the necessity for the brain to remember things and the stress input. Of actually navigating the environment. So with all this being said, you know, if we, if we, if we really wanna boil this down to, we've got proactive things that we need to be engaging in to support the growth and maintenance of our brain, but.

When it boils down to it, we also need the ingredients that our brain is made of and the chemistry that our brain uses to grow itself. And there's a lot of new data emerging about certain nutrient inputs that are very supportive of brain health. And one of those right now is creatine. Creatine is just, I know about creatine literally from 20, 30 years ago. 30 years ago. My friend took me to the gym for the first time and he had these creatine supplements and we're just taking that and then especially like right around when I was 20. You know, training with a, this guy who was like a very accomplished bodybuilder and like teaching me stuff and we'd have creatine supplements, right? But it was just like for the, for the bros. You know, just was just like to get big up. This is a muscle centric thing, exclusively. But now we know that creatine has. Some really surprising benefits when it comes to brain health. Let's talk about it.

LOUISA NICOLA: 100%. And creatine is having its moment right now, it's in the spotlight, and rightfully so because we've been sold this idea that creatine is a bodybuilding drug, that you take it to get bigger muscles, and it's really reserved for the bodybuilders. Now we've got substantial evidence to show how incredibly beneficial creatine is for the brain. Now, caveat, I've known this for several years and I was pushing out five grams a day of creatine. And we now have a phenomenal study which showed that when you supplement with creatine, 20 grams of creatine per day.

It increases brain creatine levels by 11%, which has improvements in the functioning of your brain, specifically fluid intelligence and your ability to communicate faster and better. So

what does that mean? Well, 20 grams of creatine is a lot. Right. So our creatine, creatine is a naturally occurring molecule that is produced in the liver pancreas.

95% of our creatine stores is stored in the muscle and 5% is stored in the brain, the brain tissue, right? And it's involved in cell energy metabolism and a TP production, if you will. That's a really low level way of communicating it. So we don't have enough creatine stores to put us through our, the daily activities that we do every day, right? So our brain, even though it is 2% of our total body weight, it consumes 20% of our energy. So 20% of the calories that you consume per day just goes to generating this powerhouse in our skull. So it's a hungry organ, so it needs a lot of energy. Where do we get energy from? We get it from the mitochondria within the cell.

So that's the site of a TP production, and that's where we need more creatine. So we were sold this idea that five grams a day is fine, but five grams what we know now. Five grams can saturate. The muscle, and we've got around three grams already. You know, one actually one to three grams, that we can use per day. That's why we need more of it. So we were supplementing with five grams, we're getting the benefits at the gym, but we now know that to saturate the brain tissue, we have to have more. So the evidence around Alzheimer's disease, which is what this specific one, this specific study showed, whether it's for becoming a neuroprotective agent in NFL players or anybody getting, you know, knocks to the head, or just general mental fatigue, we have to up the dose to around 10 to 20 grams a day. And that's scary to some people because we are still believing the myth that creatine increases DHT, which results in hair loss.

But that's not the case. That's been debunked. Creatine may blow you, but that's not going to cause any type of kidney issues. You know, I get on my Instagram every day, sure, you can take 10 grams of creatine, but what's going to happen to your kidneys? There's been no evidence to show that. Creatine causes any type of kidney dysfunction, right, or kidney damage, so that's fine. The only thing that it might do is you'll have some mild GI distress, and if that's the case, you can separate your creatine. You can have five grams in the morning or five grams at night. It doesn't degrade in hot water. It actually pairs well with caffeine. Even 300 milligrams of caffeine with creatine can actually boost your performance.

It can be taken in your smoothie. It can be taken anywhere throughout the day. It doesn't matter. You just wanna be able to saturate your brain and your muscles on a daily basis. So moving and making the switch from five grams to 10 grams, and if you have something really mentally fatiguing that you have to undergo, maybe up at to 15 grams a day.

I'm now actually really interested in some of the robust mechanisms between creatine and neuropsychiatry. So they're now testing, and this is in hospitals. So doing RCTs, which is the gold standard in academic medicine. They're now getting patients who are prescribed an SSRI and giving them creatine, supplementing them as well with creatine, but also getting rid of the SSRI and just replacing it with creatine. And they're finding on, they're finding on scores of, you know, of how they're feeling every day and their moods. They're finding that they're having the exact same experience on creatine as they were with the SSRI.

SHAWN STEVENSON: That's powerful. There's so many connections with the brain with creatine. We don't think about that. I love that you shared this distinction with. The storage in our muscles versus the amount in the brain. And just that in of itself, the fact that it's being stored in the brain and utilizing the brain. Now with that being said, with it being stored in the muscles. That is a reminder for us that creatine is something that is naturally occurring.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: And you could find it in foods in particular, mussel. So foods like red meat.

LOUISA NICOLA: Red meat, liver.

SHAWN STEVENSON: Liver. Fish, poultry.

LOUISA NICOLA: Yeah.

SHAWN STEVENSON: Any of these like, animal-based foods, you're gonna find creatine.

LOUISA NICOLA: But, I wanna make it known that the bioavailability of eating like a pound of red meat isn't going to be the same as getting it through pure creatine monohydrate.

SHAWN STEVENSON: Of course, and this speaks to also what are we doing it for? And so if people are like, am I not getting enough? If you're eating a well-rounded diet, you're gonna be okay. But if you are training, for example. If you're dealing with a lot of stress, like most of us are, this can be something that is obviously a helpful supplement for most people today.

LOUISA NICOLA: But not just that, we also have to think about the worldwide epidemic of 60 million people having Alzheimer's disease and that's projected to triple by the year 2050. So if we know that we are being attacked, if our brain is being attacked on a daily basis, which it is, right? Why not protect your brain with creatine? Because creatine is also neuroprotective.

SHAWN STEVENSON: Is there anything else as far as nutrients? Key foods maybe that we should be thinking about in terms of brain health. You got some new information on.

LOUISA NICOLA: Well, it just, I also wanna keep pointing out, which I always do on your podcast, it's Omega-3 fatty acids sticking to that. Moving into understanding supplementation for Omega-3 fatty acids, if you go and do a really easy pinprick test, it's an Omega-3 index test. The average percentage here, you do a pinprick test and it gives you an Omega-3 index, which is a percentage the average. Score in the US is 4% or lower, which increases your mortality, right?

So Omega-3 fatty acids can not just have an effect on your brain, but can also have an effect on your longevity. And you can go from an Omega-3 index of 4% to 5% by just merely supplementing with three grams of EPA and DHA per day. So Omega-3 fatty acids. DHA specifically, which is the primary lipid in your brain is extremely, extremely important. But then also looking at your B vitamins, polyphenols, which is found abundantly and berries and plant foods as well. I strongly recommend for a healthy brain.

SHAWN STEVENSON: A couple of the biggest deficiencies, you mentioned Omega threes huge, huge deficiency. And this is one of those things that leads to brain shrinkage. Not getting enough in

What about another big deficiency today? Vitamin D.

LOUISA NICOLA: Vitamin D is huge. In the US alone we're seeing, a another epidemic of people having a vitamin D level of 20 nanograms per deciliter, or less when it should be around 60 nanograms nanograms per deciliter. So why is that? Well, it could be a result of not going in the sun enough, or it could be the result of purely being magnesium deficient, right? So magnesium is involved, so you can just supplement with magnesium and raise your vitamin D levels alone, or you can supplement with 5,000 IUs per day of vitamin D to get your levels up. And there was a phenomenal study that was just released that showed an almost 20% reduction. If you improve your vitamin D levels, so.

SHAWN STEVENSON: Yeah, it's not operating in a vacuum. That's the thing. And that even with all this stuff, like is your body able to actually utilize it? The bioavailability and even with the, you know, our bodies converting sunlight into vitamin D for ourselves, it goes through all these different steps, you know, associated with the cholesterol in our skin and our liver has to do a job and like all this stuff to get to that end product. And are your organs healthy? Right? Are you consuming things that are gumming up this process? Are you deficient in the things that your body needs in, in particular magnesium, for example, to make this conversion process. And so, you know, really mining these things. So is there any connection with vitamin D and our brain health?

LOUISA NICOLA: Yeah, so this study specifically that showed that if we have improvements in vitamin D, it can lower our risk of getting dementia. The specific mechanisms here is we've got vitamin D receptors all over our brain. So vitamin D helps regulate mood. It helps, which can obviously help with mental health disorders. Vitamin D helps with the production of BDNF, which is brain derived neurotrophic factor, which can help with neuroplasticity. But one of the most surprising parts of vitamin D is it helps regulate microglial activity.

So, as I mentioned, we've got different types of brain cells. And we've got these specialized cells called glial cells and they're in, involved in the immune response in the brain. These glial cells kind of, they're sticky, I call them nonsense cells, but they're like glue, right? And it actually comes from the Greek word glue. But we've got smaller versions of them called

microglial cells, and this is involved in the activation of the peptide that actually builds up in our brain called amyloid beta. So amyloid beta is this, it was this demon molecule that we used to think is the cause of Alzheimer's disease. We used to call Alzheimer's disease, the neuro, the amyloid cascade hypothesis.

But what we know now is that amyloid isn't the demon here. So if we can support the immune activity of our brain via these glial cells and these microglial cells, we can fight off. Infections, we can improve our immunity and we can fight off with the clearance of amyloid beta, and vitamin D helps with that. So you can think of vitamin D helping the immunity of the brain.

SHAWN STEVENSON: Hmm. That's powerful. I love this. This is one of those things. Vitamin D is like really anti dementia.

LOUISA NICOLA: Well, yeah, and it also helps, we've got vitamin D receptors in our brainstem and specific areas that is responsible for getting us into deep sleep, right? So our brainstem, if you look at your thumb, it's about this thick and about this long, right? It's not that big. But, this is, you know, there's certain areas of it that's involved in breathing and pretty much keeping us alive, but the different areas that is involved in putting us into deep sleep, our, it involves vitamin D. This is actually why the sun, if you go out into the sun, it makes you really sleepy because it activates certain areas that are involved in making us sleepy, putting us into a calm space. So vitamin D helps with that as well.

SHAWN STEVENSON: See, look at that. Just living life. And you get these inputs and your body's telling you certain things. I love that. You know, this is, we've covered so much ground. This is amazing. We played video games for a little bit. We talked about all these different mechanisms with our leg muscles and our brain and key supplements for the brain So much. Rich, valuable information, but of course, most importantly, it's taking action. If people, if you heard something that really jumped out to you today that you were like, I'm gonna do this, I'm gonna do this consistently, please share that in the comment section. What really spoke to you today? And if you could, can you share where people can get more information, what you're up to, where can people follow you? All that good stuff.

LOUISA NICOLA: I hang out a lot on Instagram. LouisaNicola_, you can, if you're a coach, a health coach or a personal trainer fitness coach, you can come and do our longevity course then you're athletics coaching course. We've had almost 2,500 coaches go through it and we're teaching coaches how to go from fitness coach to human performance coach in 90 days. So you can come there. And that's it.

SHAWN STEVENSON: Talk more about human performance.

LOUISA NICOLA: Oh yeah.

SHAWN STEVENSON: Like what are you teaching people?

LOUISA NICOLA: We are literally teaching people how to assess longevity. So we give everyone our 10 core assessments that you can take to your clients. You give them these assessments. They range from grip strength to VO2 max and certain cognitive tests. And once you test them, you can see their rate of aging, and then you can develop a six month training program based on those protocols to improve. Their health span, their lifespan, improve how well they're going to live and get them to performing at their peak.

SHAWN STEVENSON: Hmm. Amazing. Amazing. And people can get access to this work again.

LOUISA NICOLA: Yeah. Neuro athletics. That's on Instagram. Yeah.

SHAWN STEVENSON: Neuro athletics. It's always a great time.

LOUISA NICOLA: It is. Thank you.

SHAWN STEVENSON: And I appreciate you so much for coming to hang out with us, the one and only.

LOUISA NICOLA: Thank you.

SHAWN STEVENSON: Louisa Nicola, everybody. Thank you so much for tuning into this episode today. I hope that you got a lot of value out of this. Please share this out with the people that you care about. Get them inspired to work those legs, never to skip leg day again. All right, get that input. You got legs, know how to use 'em. All right. I know you do. So this is about implementation, not just accumulating knowledge for knowledge sake, but implementation. We want to keep young, healthy, thick brains throughout our lifetime and training legs, training our body, period, of course. But specifically, we got this incredible data affirming that training your legs focusing on strength and power. And speed. Getting these inputs can help to keep our brains healthier and more resilient for a lifetime.

We've got some amazing, amazing masterclasses and world-class guests coming your way very, very soon. So make sure to stay tuned. Take care, have an amazing day, and I'll talk with you soon. And for more after the show, make sure to head over to the model health show.com. That's where you can find all of the show notes. You can find transcriptions videos for each episode, and if you've got a comment, you can leave me a comment there as well. And please make sure to head over to iTunes and leave us a rating to let everybody know that the show is awesome and I appreciate that so much and take care. I promise to keep giving you more powerful and powering great content to help you transform your life. Thanks for tuning in.