

EPISODE 331

## The Muscle-Brain Connection

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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. This episode is incredibly powerful, and you're going to want to take a lot of notes.

We're talking about something that has a huge influence on every single aspect of our lives; our ability to think, to be creative, our body's ability to burn fat, to do processes, is all regulated by that miraculous organ in your cranium. It's your brain, alright?

We're going to talk about the muscle brain connection today. We obviously do a lot of episodes dedicated to the nutrition aspect, and the sleep connection even with our brain function, and incredibly processes like your glymphatic system in your brain, which is this kind of detoxification for all of these amazing processes that take place in your brain.

There's a lot of metabolic waste that get left over, and the glymphatic system helps to clear that metabolic waste. And we're seeing issues like Alzheimer's disease being tied to an inability of the brain to detoxify itself. Right?

And so, we've found that the glymphatic system is ten times more active during sleep. And so, information like that, and episodes dedicated to those pieces of the equation have already been done, but today we're going to talk about what kind of exercise?

What is the most efficient and effective form of training to improve the function of our brains and to protect us from issues like dementia and Alzheimer's, which are just skyrocketing right now?

But plus, we're going to talk about the pros of these things as well. Not just helping to prevent the bad stuff, but how can it improve the good stuff. Right?

Potentially boosting your IQ, potentially increasing things like your creativity, and your ability to focus and perform, and your memory as well, all from the type of exercise that you do. Alright?

So, get ready to take a lot of notes. And today I'm so excited to be back in the studio. We took a couple of weeks off, I banked some shows so that I didn't miss anything with you, but I just took a couple weeks off, no travel, no nothing. Alright?

Just kicked back and relaxed, and it was so crazy because my wife actually wanted to do something kind of different for our date day, and she got us hockey tickets. I'm like, "Really?"

What was so cool was that we went to the hockey arena here, and while I was sitting there, I realized I had not been to a hockey game since I worked in that building twenty-something years ago when I was a kid in high school.

And I worked there, and I knew firsthand - and I knew she was going to get to experience this as well - that there is no environment like a hockey environment. Alright?

Anybody that knows that's been to various sporting events, the atmosphere in a hockey game is palpable, it is contagious. It's like it's one voice, right?

When everybody says- everybody says, "Ooh!" at the same time. Everybody is like, "Oh!" at the same time, and it's just like you become one. It's really, really interesting.

But when I was there, when I worked there, like I said, when I was in high school, I worked there when we had Brett Hull. Alright? Brett Hull.

First of all, his name is easy to say, which is really rare in hockey. And he scored like eighty-six goals in a season. He was a beast.

But I was there, it was like a mid-season trade, for the great one. Alright? We got Wayne Gretzky when I worked there. It was electric in this building.

We also had a couple other Hall of Famers on the roster at the same time, and so it was just an incredible experience. They didn't go too far, alright?

Not every experiment is going to work, but a cool little story is it's just the power- when we talk about the Law of Attraction, and I remember just like, "I would love-" and I just dreamed about it, I fantasized about it, having this autographed hockey stick from Wayne Gretzky.

I just thought like, "Man, that would be the most amazing thing." Cut to within a couple of weeks of him being there, of all things, he went to a restaurant that my stepfather was the head chef at. Alright?

He was an incredible cook, and he made him dinner. He didn't know who my stepfather was, or that he was the guy back there.

After he ate, I guess it was a steak dinner, he was like, "I want to talk to the chef." He gave him an autographed hockey stick that he then brought home to yours truly. Alright?

And it's just like first of all, how good was that steak? You know? How could a steak be that good to warrant something like that? That's another story.

But it became just this prized thing, you know? But of course, lo and behold the Stevenson family history, I came home from school one day, and the hockey stick was gone. He sold it. Alright? Some kind of gambling or something. I don't know.

Anyways, but I did have that moment of pure bliss, and to go back and to have this experience very different from when I worked there.

Now I'm sitting like mid-ice, great seats, they've got like food in the- I didn't even know they had this area, right? It's club, people are hanging out talking, snacks. They got tortilla chips, right?

And it's just a totally different reality, and to see the possibility, and also just having that ability to progress so much, and to go from being like an usher to sitting there at mid-ice is just- it's a really cool experience.

And so I hope you had a great kickoff to your new year, and that you're in the flow, and we're going to take things to a whole different level today because this is information that I think is going to be valuable to you for the rest of your life, and also to impact your friends, your family, your clients potentially if you're working with folks as well.

This kind of data needs to be known by everyone, alright? And so, we're going to get right into that, but first, I can't have a conversation about brain health without talking about something that I did for my brain today nutrition wise.

University of Malaysia researchers confirmed that lion's mane mushroom has incredible neuroregenerative potential, specifically its impact and function with a class of nerve growth factors that have been found to stimulate the differentiation and the re-myelination of neurons in your brain.

So, your myelin is kind of like the insulation and coating and protection over all of your nerve pathways, and this communication in your brain being able to fire correctly.

And again, this is something that we see in issues like MS, right? We see the loss of our myelin. This is something that has the potential for re-myelination of your neurons.

That is incredible, and this isn't some kind of synthetic drug. This has been something that's for thousands of years documented research; lion's mane has been something that has been used in numerous different medical systems.

But today with our modern science and modern medicine, it's finding out the power of some of these natural foods.

And this is something that I've been using for many, many years, probably ten years I've been flirting with lion's mane, but really since Four Sigmatic has added it to its organic coffee formula - the lion's mane coffee - oh my goodness, that's my jam, alright?

So that's what I had today. And they also- if you're not a big coffee fan, they have the lion's mane elixir as well, and these are dual extracted, so they're hot water extract and alcohol extract all in one simple little packet.

Open it up, add hot water, get your sip on. Alright? Protect and support your brain. And we're talking about- again, this is neuroprotective and neuroregenerative. So, creation of new brain cells and the protection of the brain cells that you have.

Some cells, the ones you've got, that's all you get. But as we're going to talk about today, there are parts of the brain that we know now can continue to create new cells throughout your entire lifetime.

Lion's mane is one of those beneficial things to support that. So, hop over, check them out. It's [www.FourSigmatic.com/model](http://www.FourSigmatic.com/model), you get 15% off. Alright? 15% off everything; the rishi, the lion's mane, cordyceps.

They're organic coffees that have these medicinal mushrooms intertwined in this beautiful medley, alright? Pop over, check them out, it's [www.FourSigmatic.com/model](http://www.FourSigmatic.com/model). That's [www.FourSigmatic.com/model](http://www.FourSigmatic.com/model) for 15% off everything. Alright?

Highly, highly recommend this. This is what I'm on today. Alright? So head over, check them out, and on that note let's get to the Apple Podcasts review of the week.

**iTunes Review:** Another five-star review titled, 'Crushing it in 2019,' by LisaGift.

"I loved the show on giving up people pleasing, procrastination, perfectionism, playing small, and living in the past. I am inspired. Thanks, Shawn."

**Shawn Stevenson:** Thank you so much, I absolutely love that, and that's a shout-out to the episode we just did, it came out a couple weeks ago to kick off the New Year, and this was Five Things You Need to Quit Doing in 2019 to crush your goals, because again, a lot of times it's not adding in new routines, new tactics, new strategies.

We need to stop doing the things that are hurting us in the first place. Even with healing the body, a lot of times it's not adding in all these different things. A lot of

people are looking for something to add in; some kind of miracle cure or supplement or drug.

We need to remove the behavior that's causing the problem in the first place. That's where we need to start.

So, thank you so much for sharing that, and I appreciate that immensely. And guys, listen, if you've yet to leave a review for the show, please pop over, leave a review. Alright?

I appreciate it so very much. It means everything to me. Over on Apple Podcasts, or if you're watching us on YouTube right now, leave a comment, let everybody know what you thought of the show, and I appreciate you so much.

And on that note, let's get to our topic of the day.

Today we're going to be talking about the muscle brain connection, alright? And we've got a ton of data right now touting the benefits of exercise for our cognitive health and the health of our brain form and function overall.

And if we even look back to episodes we did with Dr. Wendy Suzuki, for example, and I met her at a conference I was speaking at in Chicago a couple years ago, and she just blew my mind, and I was very grateful to have her on the show.

That was episode 186, and she shared that- and she's again in the lab doing this research. She found that exercise contributes to the creation and maintenance of brain cells in the hippocampus.

Now this is a part of your brain- this is a brain region that has huge roles in learning and the function of our memory, alright? Two incredibly important functions, alright?

Just our ability to learn is going to be radically improved via exercise. And so just a couple of points right off the bat, and these are various studies I just compiled and here are some bullet points for you.

Among elementary school students, forty minutes of daily exercise increased IQ by an average of nearly four points. I was taught in the university setting, your IQ is what you've got, right?

This is something that's really fixed. No, not so.

Another study among elementary school kids, this was on sixth graders right here. The fittest students were found to score 30% higher than average, and the less fit students scored 20% lower via these fitness tests and doing these academic tests as well.

Now among older students, those who played vigorously via doing sports had about 20% improvement in math, science, English, and social studies.

We need to get our kids playing, we need to get our kids active. Students who exercised before class improved test scores by 17% and those who were able to work out / play for forty minutes, improved an entire letter grade.

You can't tell me that exercise and movement isn't of critical importance to our brain and the function of our brain.

Let's move over to the adults, alright? Employees who exercise regularly are 15% more efficient than those who do not exercise regularly, which means a fit employee only needs 42.5 hours in a week to do the same work that the average employee does in 50 hours.

Basically saving an entire work day via being more efficient via you're fit via exercise.

Alright? So that's just a couple of little points I wanted to highlight before we dive in deep and talk about what the best form of exercise is.

But just know in general, if we're active, if we're exercising, if we're playing, we're going to get some big benefits to our brain.

And so this year, I want you to really focus on not just getting more physically fit, but bulking up your brain. Alright? You want to bulk up that brain. I want you to get new compliments.

Not just like, "Oh, your shoulders look nice," but like somebody's like, "You've got a thick cortex." Right? Or maybe there's like handsome hemispheres. I don't know, luscious lobes.

I don't know, but you want to get some different compliments via not just your physical appearance, but please understand this, and this is one of the biggest points I want to drive home today is that the out-picturing of your body, your physical appearance is massively influenced by the function of your brain. Alright?

Your brain has a big influence on the determination of what kind of copies are being made of you. Alright? Because your cells are continuously going through this process of replication, and some cells are going through apoptosis, and new cells are being created.

And your genes - and we're going to talk about the exercise connection to genes too, so sit tight for that - but are influenced by exercise.

Genes in your brain are influenced by exercise. You can literally print out a better version of yourself by improving that amazing brain of yours. Alright?

Now your brain is not necessarily a muscle, right? It's not a muscle but it functions more like a muscle than pretty much everything else that we have as far as organs.

Certain stimulation can improve the form and function of our brain. Alright? So really, really powerful stuff. We're going to dive in and talk about specifically which forms of exercise are the very best.

And first of all, let's talk about something that is scorching hot right now, it's been a big transition in our culture. A lot of folks now are engaging and participating and proactive about doing strength training.

A randomized controlled trial published in the *Archives of Internal Medicine* found that resistance training promotes cognitive and functional brain plasticity.

Alright? Lifting weights helps with brain plasticity. So we know today, again, a couple decades ago it was kind of like the brain that you finish developing in your early twenties, that's it. It's all you get. It's a done deal.

Some brain cells- some areas of the brain stop developing even as a child, and it's just not true for several areas of the brain. Now we understand this idea of brain plasticity, of the brain continuing to grow and to evolve and to reshape itself based on our lifestyle.

And resistance training- can you imagine that lifting weights, doing squats, bench pressing, doing deadlifts can actually improve functional brain plasticity, can promote cognitive function? That is amazing.

And yet another reason to get into the gym, or to get some weights at your house, and to start having a consistent protocol doing some strength training.

Of course we know the benefits with fat loss, the benefits with body composition, with insulin sensitivity for helping your body to manage sugar. There are so many benefits, but now we know for certain this is important for your brain. Alright?

So if you've been reluctant to incorporate consistency with strength training, this is yet another reason to really pay attention to that.

And so at the end of the episode, I'm going to give you some specific recommendations from the research on what that looks like for you.

Because you're like, "Should I lift weights every day? Should I do-?" So we're going to dissect that.

But I want to continue to give you more layers, more legs to this belief system to help to change and transform your ID and understand this muscle brain connection.

Harvard Medical School reported findings that strength training also provides an opportunity to overcome obstacles in a controlled, predictable environment, which has been found to increase mental resiliency.

What these researchers have found is that lifting weights helps you to be more mentally resilient. That's another big word for this year. That's another big word for accomplishing your goals and for transforming your life is to be resilient.

Right? We're going to come up against obstacles, but doing this process in a controlled setting, lifting some heavy weights, occasionally can make you more resilient outside of the gym.

That's so remarkable. So powerful, and I think it's important to recognize that when you lift weights, yes you're training your muscles, yes you're training your brain - now we know this - but you're also training your nervous system. Alright?

Your nervous system is really how you're kind of reading, and scanning, and interacting with your environment on multiple levels. Like unconscious, subconscious, conscious; your nervous system is how you're reading everything, and how you interact and engage with that.

And so again, it's not just when you're lifting you're training your muscles, you're also training your nervous system. Alright? Super powerful. It's the extension of your brain throughout your body.

And I'm going to give you a good example, alright? Have you ever noticed that if you're doing- maybe you're doing a certain type of exercise program, and you're pretty fit, you feel like, "I'm fit."?

Then you do a different program, maybe it's a weight lifting program, but it's a different one, and you notice that you're sweating more, and you notice that even though I'm fit and I'm even lifting weights heavier than this differently, but now it seems to be that it's taxing me a little bit more. It's a little bit more challenging.

And this is because your brain is at work, your nervous system is at work, and it's making you sweat because like your brain has to try to adapt to this stressor.

Your nervous system is trying to adapt to this new stimulation, and this is something we also want to continue to do throughout our lifetime.

Let me give you two things. Number one, we want to be consistent with our training. You shouldn't be skipping around doing a different exercise program every week.

You're not going to get those- you're not going to get the return on your investment like that, alright? We need to be consistent with something.



But at the other end of the spectrum, we don't want to get stuck doing the same thing over and over again expecting to get different and improved results after a certain amount of time.

We've got to switch it up. It's not just good for your muscles to get that different stimuli, but it's also great for your brain and your nervous system. Alright? So I hope that makes complete and total sense.

Alright, and yet another reason to incorporate strength training on a consistent basis for yourself and this muscle brain connection is the influence that it has on these pain relieving, euphoria-creating compounds that your brain and other tissues create called endorphins. Right?

This runner's high isn't exclusive to running. You also get this via strength training, and this can help to balance out your mental state to keep you more relaxed, calm, focused, and to stay more in the present.

There was a study published in the journal *Frontiers in Psychology* that revealed that lifting weights helped reduce symptoms of anxiety for study participants.

Now, this is something that we often attribute when we have the conversation about anxiety to cognitive function. Right? There's something going on with our brains, and stress, and worry, and fear.

And strength training has been found to help to relieve those symptoms, and via- one of those things that it does is producing these endorphins.

And we did an episode recently with Craig Ballantyne, which was really like a master class on anxiety. So, we'll put that in the show notes, so make sure to check that out.

But just understand it's the form and function of your brain is improved via strength training.

And so this is just one area that we need to pay attention to, to target to hopefully incorporate on a regular basis, to support this brain muscle connection. Alright?

And again, exercise in general is valuable, but I'm looking at what are the most valuable things? We've got some clinical data that we can use on a consistent basis as far as exercise to improve the form and function of our brains.

So, just to take a little step back, I thought this was really interesting. Numerous studies have shown that physical activity just in general increases brain volume and can reduce the number and size of age-related holes in your brain's white matter and gray matter.

Alright? We don't want your brain looking like Luke Cage's jacket. Alright? Shout-out to those who watch *Luke Cage* and know what I'm talking about. Alright? It's inside for you.

But we want to take care because one of the things that we see, like with spec scans for example, Dr. Daniel Amen, is that the average person, they start to get these crazy holes in their brain where blood flow and function and just circulation of nutrients throughout that area of the brain are being blocked.

Exercise is one of the things that can help to prevent that. And he's seen people incorporating an exercise program, changing their nutrition and their sleep habits, to literally reverse those issues. And it's just- again it speaks to the power that we all have to affect change right now.

Alright, so I just want to share a couple more pieces of data that I came across finding how powerful resistance training is for our brain form and function.

This study found that by doing resistance training, it induced a robust transient increase in circulating BDNF; that's brain-derived neurotropic factor.

And this has essentially been called like Miracle Grow for the brain in helping to increase the proliferation of new brain cells, and just supporting brain function overall in a big, big way.

And so endurance training has been the thing that's been really focused on for BDNF being produced in the brain, but it's not exclusively produced in the brain. It's also produced at different areas and different tissues at other places in the body.

And that BDNF, it's so interesting because it has the ability- it's one of the few things that has the ability to cross the blood brain barrier and then affect changes and have action within the brain as well.

So again, another reason to incorporate strength training.

Now listen to this. 2014 study conducted at Georgia Tech revealed that strength training for as little as twenty minutes can improve long-term memory.

The researchers had study participants to train legs for twenty minutes versus the controls who did nothing.

Two days later, they had them come in and do an image recall test, and the strength training subjects out-performed the non-lifters by 10%.

Alright? Training legs twenty minutes one time. Really, really interesting. Moral of the story, never skip. Alright?

So, I hope that's enough data and information to really encourage you and to give you another reason to incorporate strength training.

It's so- your genes expect you to lift heavy things. Your genes expect you to have resistance that your body is working against to really engage all the various types of muscle fibers have.

But if you don't use it, you lose it. The same thing with your brain. Flexing those brain muscles. Right? Getting those handsome hemispheres, alright? Those thick cortexes.

Okay? This is what we want to do; incorporate strength training. It is essential. Alright?

Now for me personally, I travel quite a bit, I've got kids, I've got a lot of stuff going on. Alright? So, efficiency is a big part of the game for me, you know?

I do love going to a gym environment. It's just that's a personal choice of whether or not you enjoy being in a gym environment, whether you enjoy being in a full gym, an empty gym, training with other people, whatever the case might be- doing group classes.

Or you like to train at home, or if you've got a decked out garage gym, or you've just got a couple things that you like to use and throw around in your kind of personal space.

Even if you're in a college dorm room, there's access for all of us. And I'll tell you right now, the tools that I use especially when I'm at home and I don't have time to get to the gym or I just want to get some of these benefits rolling in my body, even just kind of between projects I'm working on, or just task switching as the day goes on, I've got kettlebells, I've got the maces, I've got battle ropes.

Alright? I've just been collecting all of these pieces of equipment that- ballistic medicine balls, right? These are like made of the same stuff that 50 Cent was wearing that bulletproof jacket.

Alright? When he came out, it's like, "Why is this guy-? Oh, okay I get it." But these ballistic medicine balls are just- these are tough.

And I get my equipment from Onnit, alright? They are the pioneers. They're the company that put all this stuff out in the first place. Alright?

Not many companies get a partnership with *Star Wars* or with *Marvel*. Guess what? Onnit does.

You can get *Captain America* shield plates - barbell plates - if that's what you're into. Alright? And they've got these- so my kettlebells, they're called primal bells.

So they've got these various primates, and they're so cool. I've got one for my youngest son, I've got one for me and for my older son, for my wife, the various sizes of those. And they've also of course got the traditional kettlebells.

But you see a lot of folks out there now promoting and using the steel maces and clubs; Onnit. This is the company that really got it rolling, you know? The Rock, right? He's on IG showing his primal bells that this comes from Onnit. Alright?

So you guys, definitely check them out. By the way again, I mentioned *Star Wars*. If you're a *Star Wars* fan, they've got the coolest yoga mat that is like Hans Solo when he gets put in that- is it carbon freeze?

See I've got my *Star Wars* nerd right next to me to tell me what it is, alright? It's the coolest yoga mat you've ever seen. It looks like he's in the yoga mat.

And they've also got a Death Star medicine ball. Okay? Darth Vader kettlebell. How cool, alright? So many cool pieces of equipment, but these are functional, these are durable, these are things that give you a lot of options in the type of training that you do.

Total body workouts, literally just within reach at all times. And so I highly recommend, check out their fitness equipment. Get yourself a couple of pieces of these equipment because this is something that just- I love when I step into my garage and I see these pieces of equipment. They inspire me to work out, you know?

They're fun but they're also challenging and teaching me new skills. And like I mentioned earlier, you don't want to get caught in a rut of doing the same thing over and over again. And as you'll discover as the years roll on, more and more information is put out there is going to be about functional training and being able to use tools like these that you can flow and do different movements and that aren't just having you go in one static direction.

That's not necessarily healthy to be doing all the time as well. Alright? So pop over, check them out. You get 10% off all of this stuff, by the way. Alright?

Go to [www.Onnit.com/model](http://www.Onnit.com/model). That's [www.Onnit.com/model](http://www.Onnit.com/model) and you get 10% off all of their fitness equipment and also all of their incredible Earth grown based- Earth grown nutrient based supplements as well, alright?

So pop over, check them out, [www.Onnit.com/model](http://www.Onnit.com/model).

So let's circle back and look at- when I mentioned earlier about exercise being able to impact genes in your brain, and where this data is coming from.

So researchers at the University of Bristol found that exercise actually changes the expression of genes in the brain, specifically genes that appear to have a heavy influence on coping with stress.

Please get this. This is so powerful. Strength training changes genes in your brain that help you to better deal with stress.

The study earlier talking about resiliency, it's not just some kind of like a side effect. It actually is changing the genes in your brain. Strength training is an epigenetic influence for your genes in your brain. That's just remarkable. Really remarkable.

Now here's something really cool, I just wanted to share this with you. Yes, you affect your genes with the exercise, but you're actually going to be able to pay those benefits forward.

Listen to this. Numerous studies are now confirming that there are significant links between pregnant women's physical activity and the brains of their gestating babies.

For instance, this 1996 study published in the *Journal of Pediatrics* showed that at age five, children of moms who exercised regularly during pregnancy performed better on tests of general intelligence and oral language skills than children whose mothers had not exercised very much.

Another study published in 2016 showed that boys born to physically active mothers had higher scores on math and language tests than boys from sedentary mothers. Alright?

So this is something that we need to incorporate for our kids' sake. This is about legacy, alright? We're passing these genes on - these epigenetic influences - but please understand no matter what, ever if you're like me and you're like, "My mom probably didn't do much besides like walk to the car and then back to the couch, I don't know," you still have massive opportunity personally in your own life to influence these epigenetic triggers.

So please understand. But knowing this data, we want to be more proactive and intelligent in how we're supporting our future generations. You need to move.

Guys, we're not off the hook here. Alright? Please understand, this is also influenced potentially by the father as well.

A study published in the journal *Epigenomics* reported that three months of physical exercise changed the DNA methylation patterns of young men's sperm.

The results said this: global and genome-wide sperm DNA methylation was altered after three months of exercise training. DNA methylation changes occurred in genes related to numerous diseases such as schizophrenia and Parkinson's Disease.

This is a methylation opportunity because- and we did an episode about this, talking about these snips that can occur with our DNA, and they're basically mutations.

And methylation is an important process for your DNA to be able to function properly, to have your cellular detoxification channels to work together.

And so this data is sharing that exercise can potentially help to ensure prevent issues like schizophrenia and Parkinson's. We're paying it forward. Paying it forward.

Alright? All of us. This is something that it's not just about us, it's about our future generations as well.

Okay, and so again, if you feel you have the cards stacked against you from your parents though, and this is like a personal issue with you, rest assured things can be improved because as we've talked about today, there are many benefits to what you do right now in improving the form and function of your brain. Alright?

But I wanted to share that just to give us a bigger kind of meta perspective, to get out of our own little lives, and to know that when you exercise it's literally not just about you. Alright?

It's an influence to our kids and our family and our community that we have right now, but also again potentially passing those benefits on. Alright?

So really powerful, but this just goes back to understanding that these are things that our genes expect us to do. Expects us to lift heavy things occasionally, and also this next point as well, and this is another big part of the muscle brain connection and what type of exercise our brains crave in order to be the fittest, healthiest that they can possibly be.

And this is highlighted by a 2017 study published in the journal *Scientific Reports* that revealed that balance training- balance training improves memory and spatial cognition in healthy adults.

Balance training. Have you ever thought about that? Is that something that you proactively are engaged in? Balance training? Working on your balance? Because there are some big benefits.

Now, we mentioned the hippocampus earlier. The hippocampus belongs to this ancient part of the brain known as the limbic system.

And this plays an important role in the consolidation of information, helping to convert things from your short-term memory to your long-term memory, as well as spatial navigation. Okay? Spatial navigation.

So this has to do with you being able to navigate your body throughout your house. Right? To move around the coffee table, that kind of thing.

But also to be able to navigate your car throughout your city. Right? The spatial navigation. We have this internal Google Maps, alright? And it's constantly being upgraded or downgraded based on our lifestyle decisions.

One of the things that has been found to improve that - that map system - is doing balance training. Your brain needs this.

So basically study participants who did balance training twice a week for twelve weeks with a trainer had significant improvements in memory and spatial navigation than the control group who did not do anything.

Now this includes single leg exercises, for example, dual leg exercises also with both feet on the floor on various surfaces. Right? Or you can have resistance incorporated.

So maybe you're doing a one-leg stance, and you've got some resistance, maybe it's a band pulling you in a different direction.

But being able to engage with those types of resistance and that kind of stimuli literally improves your memory and your spatial navigation.

And so this can incorporate things like wobble boards are kind of popular right now. Bosu balls, right? Different pieces of equipment as well.

But it just gets me thinking again, what does your brain expect? It doesn't just look for that same push / pull motion that we find in typical gym equipment.

We need to be more functional, more adaptable. Through our evolution we'd be balancing on things. Maybe you're walking across a log to cross a creek, or a small-pond or something like that, or climbing trees, or just needing to be able to be kind of light on your feet, and agile, and balance through different terrains. Right?

Maybe you're climbing mountains and things like that, gathering herbs, I don't know. But the thing today, we don't have that, and a lot of stuff that we do is very typical push / pull motions, which is all good, but we need to think about balance training as well because there are some huge benefits.

Again, activating these genetic- these kind of epigenetic triggers in our brain for better results.

Another thing that we get from this type of motion- so let's look at this. The hippocampus that we've talked about already belongs to an ancient part of the brain known as the limbic system. Right? The limbic system.

This is really- it's kind of the emotional center of the brain as well, and it plays an important role in the consolidation of information from basically converting your short-term memory to your long-term memory.

And also, your hippocampus is heavily involved in spatial navigation. Alright? Spatial navigation. So what does this mean?

This means basically navigating yourself around your house, navigating around the coffee table, the Legos. I've got Legos, alright? My son, it's his thing. Alright navigate- I mean, he's pretty orderly with it, let's be real.

I'm not like stepping on Legos. It's terrible for those who deal with that. But we do have this rug that can hide Legos in it, okay? There has been a stud or two, okay? And I have not fell victim, I'm just saying.

Being able to navigate around stuff in your house, and also navigating your body and your car around your entire city. All of that has to do with spatial navigation.

We have this built-in Google Maps in our brains, in our nervous system that's helping us navigate through the world. How important is that? You don't want to lose those faculties.

These are things that are lost through the average person's aging today that normally our ancestors would have these functions well, well into their senior years. Alright?

We don't want to just- we want to die at an old age very young. Alright? Does that make sense? We want to maintain this youth and live a long time and understand that in our culture today - I've said this many times - that today people are not necessarily living longer, we're dying longer and we're losing a lot of these faculties.

And these are simple things we can do to support this functionality and form of our brain so we can live a long, healthy, active life.

Another part of this equation involved with balance training is the development of something called proprioception. Alright? Proprioception is your body's awareness of itself in space. Alright? It's your body's awareness of itself in space.

This has a lot to do with your nervous system, and how you are just aware. Like you don't have to look down when you're changing from the brake to the gas pedal. Right?



You don't have to constantly stare at your hands to put popcorn into your mouth at the movies. Right? I don't know why that popped in my head, but it did. Alright?

Whatever it is, you don't have to constantly- you know, I was just walking from my garage to my house yesterday, and there's like the stones, and there's stairs and all this stuff, and I was thinking about this.

Like as I'm taking the steps, I'm just like, "I don't have to think about none of this. I know where my body is. My body knows where it is within this terrain," and it's just like- wow. This is a really amazing, beautiful thing that we have as humans, to be able to develop this, and to be able to live without constantly having so much mental energy to think about things because of this proprioception.

And so this is something that's developed via certain types of training. So balance training. So here are a couple things that can improve your proprioception.

Box jumps. Box jumps. Things that train speed and balance are really great for proprioception. So box jumps is something that we know improves your proprioception.

Right? Being able to be aware, "Where is that box at?" when you're making these jumps. Single-leg squats. Simply balancing yourself on different surfaces, right? I mentioned the Bosu ball earlier.

Listen, I want to be real. I still don't want you standing- so the Bosu ball, for people that don't know, that's like the half ball. Right? It's like a flat bottom, then it's got the stability ball surface to it. Right?

You could do some cool stuff on there, you know? Maybe do some single-leg deadlifts or whatever. Alright? A couple bodyweight squats.

But when you're putting a barbell on your back on a Bosu ball with 225 on the bar? Stop. I mean, what are you doing? Alright?

There's memes out there about this; people getting on a stability ball with this huge barbell on their back and wonder why we've got ACL issues. Alright?

Just let's not be silly about it. What we want to do is try to replicate things that maybe our ancestors might have done, and things that our genes might expect.

Like as kids, we're constantly trying to balance on stuff. Right? You know, when you're a kid, you just hop up on the side of- you know, like the little parking things that separate the parking spaces. Right? You've got that little concrete thing.

You jump up on those, walk across, jump to the next one, right? Step on a crack, break your mama's back. Don't break her back, right?

You're staying out of the lava when you're walking, like you're trying to balance and just hop up on stuff, and use that versatility, but then we stop doing that as we get older. Right?

Straighten up, and you start being boring. Right? Walk in a straight line everywhere. Loosen up, have fun, use your environment. That's one of the ways that's also going to improve your proprioception.

And then we've got things- people breaking out the slack line, like they find some trees or whatever and then they're walking on the little tightrope thing, the wobble boards, Bosu balls. Just working on your footwork, you know?

You can get yourself a ladder, right? The ladders that you put on the ground, right? It's like a roped ladder, not the ladder to climb up on your house, and doing speed drills, footwork drills.

Things like that are going to help with this as well.

And what is proprioception? When it really boils down to it, it's really like a sixth sense. You know? We know the sense of taste, and smell, and touch, but proprioception is really an extension of our senses.

And this sixth sense helps us, again, to navigate and to relate to the environment around us. It's your body's awareness of itself in space in relationship to itself and the environment

Really powerful stuff. And by the way, when I said 'sixth sense,' did you think about the movie? Did you think about Bruce Willis and that little weird kid? Alright?

I did when I said it and when I thought about it, and I know that happens a lot of times with different movies, and things like that.

For me, whenever I hear- whenever somebody says- this is a true story. If somebody says 'monster,' or 'little monster,' I think of the movie *Little Monsters*. Alright? Howie Mandel. Okay? Classic.

Another one I think about is Spike. Right? Whenever I hear somebody mention a spike, or *Spike TV* station or whatever, I think about from the *Gremlins*. Alright?

It's these weird mental connections in our mind, right? And little Gizmo, and just like don't get him wet after- what is it? Don't get him wet period, but then don't feed him after midnight. Okay?

This sounds like some people I know. Right? Don't do that, alright? Bad things will happen. But you know, so cute. Gizmo is like, "MTV, HBO." Super cute.

I had a little Gizmo little- I don't know if I would call it a doll. I don't know, but a stuffed character. And yeah, so when I hear 'spike,' I think of a movie. When I hear 'sixth sense.'

It's crazy how our minds work when it relates to things like songs, and movies, and I just think that's pretty interesting.

But with that said, again, proprioception, you don't have to think about it when you're watching the movie and putting the snacks into your mouth. Right?

It's all part of the big equation.

So, doing balance training is going to support these areas of the brain that support proprioception, that support memory, that support your spatial navigation. Alright?

So, things that your brain craves; we covered strength training, balance training, we're going to cover one more area.

Research conducted at the New York University School of Medicine as well as some other scientists from other universities found recently that mice that ran frequently on wheels had higher levels of BDNF. Alright? Brain-derived neurotropic factor.

It appears to be a protein called Cathepsin B, which is secreted by muscles during physical activity, and this is what has been found to spark the neurogenesis related to exercise. Alright?

So, we found a specific protein. This is how muscle engagement is sparking that process of neurogenesis.

So, check this out. So, that was done with mice, but a human study - this was a 2016 study with human participants - found that test subjects who ran on treadmills had elevated blood serum levels of Cathepsin B after exercising.

Following four months of running on the treadmill for three days per week, forty-five minutes or more, participants drew more accurate pictures from memory than at the beginning of the study before they started exercising. Alright?

Now listen, this category here is walking and 'yogging.' Okay? I don't call it jogging, I call it yogging. Okay?

So we've got a lot of the data out there about the brain benefits of exercise are related to jogging. Right? That moderate intensity kind of thing.

Now full disclosure, I'm allergic to it. It's not my favorite thing in the world, but this kind of research opens me up to start thinking about things differently.

And now we know, we've got massive data showing that getting out and jogging for these long amounts of time is not the best form of exercise for transforming our body composition.

We know that it's high-intensity interval training, we know that it's strength training, and also walking. But this has me thinking differently about something that I'm personally going to begin to incorporate more because of the brain benefits. Alright?

This does not mean you need to get out and run forty-five minutes multiple days a week, but maybe like if your thing is kind of like me, like you like to do some HIIT training, maybe do some sprints, lift some weights, that kind of thing, and walk and just kind of be mobile and active through your life - which my formula is pretty great for me, and you do get a lot of benefits from all this stuff - but hey, we're getting the biggest spark potentially of brain-derived neurotropic factor from doing some moderate intensity cardio.

So, maybe I might want to mix that in once a week or every other week, just get a couple of sessions in, and train my body and my brain a little bit differently. You know?

So, I just want to put that out there because there was actually a study that looked at high-intensity interval training versus moderate cardio versus strength training versus doing nothing.

Obviously doing nothing lost, alright? The other three had benefit. The most benefit was seen - as far as brain-derived neurotropic factor and some other things - so that moderate intensity jogging led to an increase in cell proliferation, survival, neuronal differentiation, and neuronal cell migration.

In contrast, the high-intensity interval training only promoted neuronal differentiation and migration. Right? So getting from the places that they're generated to places that the cells need to go to be able to migrate to the places that they need to be in order to have the proper function.

So, I hope that makes sense. Right? So your brain cells being able to get to the places that they need to be to keep you as healthy and functional as possible.

So, we do get benefit, but you get a little bit more benefit from what they studied in this particular research.

So again, just something to think about. It's not that- if you're into high-intensity interval training and strength training, it's not to stop doing that, but maybe you might want to consider adding in moderate intensity cardio every now and then. Alright?

So with that said, let's look at one of my other favorite forms of exercise that I used to be allergic to. I thought it was for the weak. Alright? I'm just going to throw it out there.

When people would tell me ten, fifteen, twenty years ago that they were walking for their health to get in shape and this kind of thing, I'd be like, "It's going to take you a long time." You know?

"You're going to have to walk a long way. It might be a coast-to-coast deal. Alright? You'd better book some motels along the way or whatever, but it's going to take you to walk to where you're trying to get, it's going to take you a long time.

It's just not true. Walking is medicine. Walking is the number one form of exercise that humans are designed for. Are we designed to back squat 300 pounds? I don't know.

I mean, we can do it and we can get great benefit from that, but are we designed to do that? Not necessarily. Are we designed to do a bench press? Not necessarily.

We are designed to walk. That is the number one thing our genes expect us to do as humans as far as movement and exercise, is walking. Alright?

So we're listing all kinds of epigenetic triggers. We talked about in many different episodes from improving the function of our immune system, our blood sugar management, our cardiovascular health, ability to burn fat instead of spiking cortisol, which is what we do with kind of the moderate 'yogging.' I said jogging earlier a couple times.

But when we're doing that, we're also in that balance of like stress, and trying to get the benefits that we want, whereas with walking, it can be a much more relaxing serotonin kind of driven, feel good type of thing that gives us all of this benefit.

And so here's another benefit. 2007 study conducted by German researchers found that daily walking can statistically improve working memory. A Stanford study found that walking increased creative inspiration by an average of 60% versus sitting.

Please hear that. The effect was evident while and shortly after walking anywhere between five and sixteen minutes, and it enhanced a specific flavor of creativity called divergent thinking.

Enhanced divergent thinking. This is thinking outside of the box, because when we're thinking and trying to solve a problem, sometimes we're so in it, we can't really think of the ten other ways that this thing can be solved. We think it's just one.

Divergent thinking is that, where we find new and better ways, creative ways of solving our problems and to getting to where we want to go.

This is one of the things that I've found to be just- anecdotally if I just stop, walk away - literally walk away - from the work I'm doing, I come back, like I get so many new ideas.

And I might be pressing, and getting work done, and just kind of powering through. It might be sixty minutes writing.

If I can just get myself, just walk away, go for a ten-minute walk, everything is better without fail. So it's just like why wouldn't I do it? It's because we get caught in that loop and we don't give ourselves permission to do something like this because we don't see the benefit of walking away. Alright?

So with that said, this is something else for us to incorporate to get benefit from. Incredibly valuable for our brain, for our creativity, for our ability to think, and to think divergently.

So to kind of wrap everything up today, we covered these three different forms of exercise that the brain craves, and we talked about the connection between the brain and exercise on many different levels, and I just hope you got a lot from this.

I want to give you some walk away tactics and points, some action steps to take along with all of this.

So number one, we talked about strength training and the benefits that it has on your brain. So, what does this look like? What are the recommendations?

So in the research, scientists consistently were finding that two days of strength training per week is really the minimum effective dose.

Like that's where we really see on average the best benefit, is getting at least two days in, maximum of five days. Right?

And so, that wouldn't be training every body part five days a week. That would be like some split training, working different muscles, that kind of thing.

But doing two total body strength training sessions a week - two to three - is right on the money for getting so many of these benefits.

So that's the recommendation with strength training. Get yourself two to three sessions per week, and you're going to be keeping your brain healthy and happy for a long, long time.

Also we talked about balance and speed. Training balance, right? Balance workouts. These are things that can be incorporated with your strength training sessions or your cardio sessions or even when you're going out for walks.

But we want to incorporate this, again, at least twice a week. Work on balance. And so again, this could be box jumps. I love box jumps for many different reasons.

Also, the kind of anabolic hormone benefits that we get from that kind of activity as well. But single-leg exercises including single-leg squats, AKA pistol squats, and there are progression exercises that you can actually do to get yourself to a place where you can do full unadulterated pistol squats.

And I actually have many progression exercises and progression exercise trainings in my inner circle- my online fitness program, my membership site, *The Fat Loss Code*.

And so if you're not a part of that, you are really, really missing out. This is where I'm really giving my very best information on fitness and changing your body composition. Right?

So we've got several new workouts that we provide each week, nutrition plans that are personalized. So this is going through stuff that I would do in my clinical practice to really hone in and find the very best nutrition for you, giving you that training so that you can continue to adapt and change things as you adapt to change.

Because what's working for you right now might not work for you six months from now, and you need to have the tools to be able to adjust things for yourself.

And so, that's a big part of the community. We also do weekly Facebook Lives. It's just a really good time. I love this community. Just go to [www.TheFatLossCode.com](http://www.TheFatLossCode.com) and you can get access to the membership program there.

And again, the progression exercises, we've got that for things like if you're trying to get to a place where you can do muscle-ups or pull-ups.

I've had so many people go from non-existent pull-ups to being able to jump up and bang out five, ten, twenty, thirty push-ups depending on the person, which sounds outrageous, but just having these progression exercises and workouts that go along with them is so amazing what we're able to do.

Alright? So you can pop over, check that out, [www.TheFatLossCode.com](http://www.TheFatLossCode.com). In addition to that, single-leg exercises, also working out on unstable surfaces, working out with different weights, different size weights.

So maybe you're doing a farmer's walk - this is where you pick up two heavy implements, maybe they're kettlebells, or dumbbells, or sandbags, whatever they are - but maybe one is fifty pounds and one is forty pounds. Right?

So training your body- and of course, like alternating sides so you're balanced. You know? Maybe do two sets for each side. But just that balance training where your body has to adapt to different pressures, because that's what life is.

When we're working or playing, your body is having different stimuli's that are not balanced. Right? The impact of the environment around us is not always equal, and so training ourselves for that.

So, this could also be incorporating those foot work drills I talked about, wobble boards, Bosu balls, slack line; so many different things. Alright? So many different cool things to play around with. Alright?

So, make sure that we're getting in two sessions of balance training. And finally, walking and/or kind of conventional cardio where we're jogging.

This is- number one, walking is daily. What we've found is that just eleven minutes of walking per day can literally add potentially two plus years to your lifespan. Alright?

This can help to keep your brain younger. This can help to prevent insulin resistance simply by walking just a minimum eleven minutes a day.

Ideally we want to get around to that 7,000 - 10,000 steps potentially, but we've got to have a good on ramp. So, I just recommend daily we need to be walking. Just get out, go for a quick ten-minute walk at minimum- ten or eleven-minute walk, and from there if we want to stretch it out a little bit, that's kind of superstar status is getting in that 10,000 steps.

Alright? That's what we really want to target. Right? And then as far as the cardio, this just depends on you.

If you love to get out and jog or cycle, that kind of thing, go for it. This is a good implement. However, if it's body composition driven, make sure we're getting the strength training in, high-intensity interval training, and that is a complement for your brain doing the conventional cardio.

Alright? But if you're not doing conventional cardio, getting out and jogging for a bit or cycling, a little bit longer stint, maybe you might want to add that in. You know?

At minimum maybe one day a week every couple of weeks. I'm talking from my own experience right now because I'm like, "I'm going to do this," and it's just not my cup of tea necessarily. But I do want to test and find out some of these benefits.

You know? Because for me, my formula has worked incredible for my body composition, for my health, for my cognitive ability. But what if there's something else?



So, this is what it's all about. All of us having the audacity to test things out, to try things for ourselves, and get that feedback.

There's no greater feedback than paying attention to how we look, feel, and perform ourselves. And sometimes we've got to get out of our comfort zone. Alright?

So adding these things in; a daily walk, balance training at least twice a week, strength training at least twice a week, and moderate intensity cardio as much as you want.

Sprinkle that in, get that in there. If it's kind of the heart of your training, all good. Make sure you're doing some of the other stuff. And if it's something you're not doing, let's have the audacity to add a little bit of that in this year. Test it out, and see how it feels, and see how your brain is loving it.

Alright so listen, I appreciate you so much. I hope you got a lot of value out of this episode. We've got so many incredible interviews and show topics coming up this year.

I'm just so excited and so grateful, and listen, if you got a lot of value out of this episode, please share it out with the people you care about.

Share it out on Instagram, Facebook, Twitter, anywhere- you could email it, send a raven, whatever. Get this episode to people you care about to help.

Because listen, sharing is caring, alright? But it's truly to help up-level their lives as well. So I appreciate you so much. Of course tag me on social media, let me know what you thought about the episode, let everybody know what you thought about the episode, and stay tuned for much, much more because we've got some really good stuff coming for you, so be ready.

Alright? I appreciate you immensely. 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 [www.TheModelHealthShow.com](http://www.TheModelHealthShow.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.

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And take care, I promise to keep giving you more powerful, empowering, great content to help you transform your life. Thanks for tuning in.