



**EPISODE 783**

# Heal Your Body **FASTER** With These Science-Backed Tips

With Guests: Dr. Tom Walters, Jill Miller, Ellen  
Lander & Dr. Adeel Khan

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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. I want you to heal as fast as humanly possible. I want you to be able to access your Wolverine potential, alright. To be able to heal from whatever injuries and ailments, that you might be faced with because it's inevitable. It's an inevitable part of life, especially if you're getting out here and you're enjoying life and you're taking some calculated risk. Sometimes some risks are not that well calculated, but if you're out here challenging yourself, sometimes we're faced with things that hinder us in the form of pain and injuries. And so what I wanted to do was get the very best people in the world in the fields of rehabilitation, pain management, and also the science around how your mind impacts the rate of healing and put that all together for you today in this powerful masterclass. And so in this episode, you're going to be hearing from world leading board certified doctors of physical therapy, world leading psychologists in the field of healing and anti aging, and even the leading person in the world, the number one practitioner in the field of regenerative medicine. And so these tips, insights, and mindset to heal faster are all here for you today. I've got five experts in total for you and we had to kick things off with a segment from an interview that I did with Dr. Tom Walters.

Now Dr. Tom Walters is a board certified orthopedic physical therapist, strength and conditioning specialist, and author of the bestselling book, Rehab Science. He's going to share with you why it's critical to understand what pain actually is so that you can properly assess the best way for you to heal. Also, he's going to share how physical pain can actually be triggered by mental and emotional stressors. Plus why smart movement with painful tissues is actually far more effective for healing than completely immobilizing those tissues. This and much more. Check out this segment from the amazing Dr. Tom Walters.

**DR TOM WALTERS:** We have so much research from different studies showing just how helpful pain education can be, you know. There's so much fear and anxiety around pain when you're injured. We were talking about that before. You just don't know what's going on is this serious. Most people, most people associate pain with some physical injury in their body, and a lot of times we know that's not the case. So there's a lot about pain education that can help reduce fear and anxiety and just get people

moving in the right direction so they don't become so fearful that they stop moving and suffer all those other, you know, deconditioning atrophy. All those things that happen when you are sedentary and increase your risk of injury later. So, you know, when you look at the definition of pain, kind of the main body out there is the international association for the study of pain.

And the definition for pain nowadays is basically an unpleasant physical or emotional experience that they say is associated with actual or potential tissue damage. And I think that part, actual or potential tissue damage, is really important. And that's a, it's a recent change probably in the last 15 years. But most people again will think of, I have pain, I have actual tissue damage, something I've torn a muscle or I've torn a ligament or, you know, I've, I've torn my meniscus. I've done something like that. And really we have a lot of cool studies showing that your brain, we know pain comes from the brain now from these studies, but it's this experience outputted by the brain in response to perceived threat or danger. So, we see situations where people actually have pain when there's no tissue damage, but they believe there's the potential for it. And when you can make people believe there's the potential for tissue damage, you can create pain. So, there's kind of crazy studies. Well, a lot of them are out of Australia, one of the most known pain neuroscientists is located in Australia and he does a lot of study on this.

So it's a fascinating area. Just the brain in general is fascinating and pain is no different. Pain was looked at in this sort of linear relationship. It was called the Cartesian model, which is basically, you would have something, basically pain came from the tissues of the body. So, and it would just, so you slammed your finger or you burned your hand or something and basically the thought was "oh" You've got these pain sensors or receptors in your tissue that relay that pain message up to your spinal cord up to your brain And then tell your brain. Hey, there's pain down here. You got to do something about it. And really the more recent research on it has shown that we have nociceptors. So they're These small nerve endings in the nervous system that basically detect high threshold stimuli. So if you think about it like, if you were squeezing your finger, if you slowly increase the pressure, In the beginning, it's just pressure, right? But at a certain point, you can activate those nociceptors, those high threshold receptors, those sensors, and they will then relay a danger message. So that's nociception. It literally stands for danger reception. And so that nociceptive message will travel to different regions of your brain and then your brain basically decides Is it, should I create pain?

**SHAWN STEVENSON:** Mmm, right.

**DR TOM WALTERS:** And that's looking at everything in the environment, your brain is constantly weighing the situation because there are times where it's good to output pain when you have no c section, right? To cause pain at the end of the day is about survival and protecting you and keeping you alive. So there are times obviously when no c section is coming in, you've got these danger messages coming into the nervous system, into the brain, and you want to output pain to protect the organism. But then there are times where outputting pain could actually be harmful. So one of the, one of the examples that's given quite a bit for this is if you're crossing a busy street and you twist your ankle. If you're out in that lane Having pain in that moment is not ideal because you're going to change how you move. You're gonna slow down, you risk being hit by a car or bus or something. And so your brain has ways of Blocking nociception. You can even almost like a dimmer switch. You can turn it down and basically blunt that response so that pain isn't created so that you can get out of that situation and be safe. And we see all kinds of things like athletes, soldiers. There's all kinds of stories of really traumatic physical insults where the person experienced no pain. You know, and maybe later they felt pain when they were safe, but not in that moment.

**SHAWN STEVENSON:** You gave the example of this guy having a bullet in his neck and then it's showing up on a scan later. It's like, Oh, it's a bullet in there, I guess.

**DR TOM WALTERS:** It's crazy. Yeah. That there's all kinds of ones like that where people have had these traumatic things. I mean, that guy, yeah, the bullet in the neck goes in for some other issue. They're doing a scan on his neck and. Discover there's a bullet in his neck. And for whatever reason, his nervous system just didn't think of it as threatening. So he never experienced pain with it. So it's pains, it's a super internet, an interesting experience. It varies, obviously we, we all vary in terms of our pain perception and threshold. And, I talk about it, they talk about the pain neuroscience world is they call them neurosignatures, these patterns of areas of the brain that fire when creating pain, it's almost like a fingerprint, you know, it's, it's A lot of the same areas, but people are different. You know, if you take people with back pain, low back pain, even if their symptoms are somewhat similar, if you look at their brains, the pattern of neurons that fire to create their individual pain is different in each person.

**SHAWN STEVENSON:** Yeah. That's also fascinating too, is that no two people experience pain the same way. In the history of humanity, all of us have a unique. Kind of signature like you said our fingerprint when it comes to pain and it's based on obviously We've got these sensors in the cell. We're going to talk about that in a moment our brain and nervous system but also our perception of things and also Stress levels various stress inputs that you talk about and just unpack this a little bit more. I want to talk about You know, you also highlight something really important in the book that pain is valuable. We see pain is just bad. We just want to get away from all pain. Pain is bad. But pain is a really valuable kind of uh educator in our system.

**DR TOM WALTERS:** For sure pain is a great teacher. I think when the nervous system, it can get tricky when people have chronic pain, you know and even in those situations a lot of times it still is a teacher. And it can help you help inform if you can be aware and Try to really cue in on all these factors that can influence pain, not just the physical body, but your thoughts and beliefs and stress and sleep hygiene and nutrition and all of these things that can influence your nervous system and consensitize it. There's so many of those factors that people aren't aware of and I think when you learn about those, this is where pain education can become important. When you learn about those, you become aware of them and you can start looking at what is, why is this pain occurring and what is it telling me about my life?

Most people will only think about pain as what's wrong with my knee? You know, what's wrong? Is my, do I have arthritis? Do I have a meniscus tear? They will try to blame all pain on something in the physical body. And for sure there are situations of pain that are very much associated with the biological system in your body. But Lots of people have pain. I have a pain issue in the right side, kind of of my thoracic spine that started six years ago, pretty much at this point that started from a physical injury. I was in jujitsu and I hurt a rib and it was at a time period in life that was stressful. I was in a stressful job. There was just a lot going on. My kids were young, just, I was kind of ramped up. And to this day, that tissue is healed, right? There's no injury back there anymore. But if I get stressed out, particularly that seems to be the trigger, even if it's positive stress, like I'm about to go on vacation, that spot will start hurting.

So, you know, we know from the research that, you know, our endocrine system, different neurotransmitters of the nervous system, when those things are in your bloodstream, cortisol, elevated cortisol levels with stress, those things can sensitize

your nervous system. So it's really important to be aware of all these factors that influence pain. And again, can be a really powerful teacher. If you can really try to focus on it and think about it. A lot of times it can help you identify these things that might be off in your life. Usually that pain is trying to tell you something, you know, something's not right, almost like a balance. There's something maybe out of balance in your life. And I think for a lot of people that, and in a lot of cases, if pain persists is related to stress. For sleep and nutrition factors, you know, and probably a lack of exercise and just general movement too. There's grades of injuries. And so you've got to think about most of these things where somebody be immobilized like that relate to tendon and ligament injuries, fractures, of course, to like a fracture is kind of a different beast.

And if you have a fracture that's needs to be immobilized, that's kind of maybe the one time you'd really think like, this is probably necessary depending on how severe or complicated that fracture is. But man, when you get into soft tissue injuries, this was actually just published in the British Journal of Sports Medicine. But now we look at this, it used to be RICE, right? Everybody heard RICE, rest, ice, compression, elevation. That's kind of changed over time. And so when you look at these new research on soft tissue injuries, which would be tendons and ligaments, most things in the physical body, they're, none of that is immobilized. Actually it's movement. You want to be mobilizing and moving the area. And of course that's respecting your symptoms and your function at the same time, but just like your example, if somebody walks in and can complete many functional tasks without symptoms. And they don't show some other signs like maybe, you know, this wouldn't happen so much in the ankle, but maybe somebody tore their ACL.

Maybe they have severe knee instability. And so then maybe they don't have pain, but they can't control their joint and the risk of injuring other structures like the meniscus or other ligaments. Maybe there's a place for partially immobilizing them. Rarely is it full immobilization, like the boot you're talking about. But if somebody comes in being able to do some of those tasks without symptoms, no way. I mean, it doesn't make any sense to fully immobilize them. And it really should be more, because again, you do that and you for sure are going to cause disuse atrophy. Everything is going to decondition. And then to tell the person that they can just wear that and then go back to normal life is hugely irresponsible because now they are deconditioned. The soft tissue injury risk is way higher because Our body does not waste energy maintaining muscle mass and, you know, tendon thickness, ligament thickness, things like that.

when it doesn't need to spend that energy. So you are going to atrophy and that tissue is going to weaken, the capacity of that tissue will drop.

And so if you come out of being immobilized and just, I'm going to go play basketball. Well, now your risk of rupturing your Achilles is way higher. So we talked about this a lot and with physical tissues, kind of the capacity of that physical tissue. You have to kind of, that's a good way to think about for people is that our musculoskeletal system is extremely robust and adaptable. And a lot of times people are in pain, they start thinking that they're fragile, you know, that they're going to break, something's going to happen. And so a lot of it is trying to reassure people really physical therapy is mostly therapy. And the longer I've been in it and a huge part of it for pain is really therapy. And it's really trying to reassure people that the musculoskeletal system can adapt and change when you expose it to the right levels of stress. And yes, sometimes there is a place for being immobilized and letting something heal. But being immobilized means that there's absolutely very minimal stress on the system and you're not going to help encourage an increase in that capacity of those tissues.

So if you don't have horrible symptoms, you don't have a bunch of pain, you're not showing other signs that if they were present could lead to other injuries of other structures, then yeah, of course you really want to keep moving in the ways that you can. And then with gradual increases in stress, build up the capacity of that tissue and that's usually mostly resistance training, you know resistance training has by far the most evidence. And that's mostly you know mobility things like that have a place. Of course early in rehab, but most of it is on strengthening like you want to strengthen tissue and if you're immobilized, it's for sure getting weaker.

**SHAWN STEVENSON:** Your field is one of the most valuable and you said it before I was going to say this before you even said it. The therapy part of it. That's what's overlooked because it's not just, it's not just the psychological aspect, but you have therapy through movement too. It's a powerful combination.

**DR TOM WALTERS:** Yeah, it's huge. I think I really think of myself more now as sort of a coach for people because people have to have the mindset that getting better from pain and injury requires active participation in most cases. You have to, as the individual, take responsibility for your body and actively participate. Too many people think of it as just this passive thing. I'll go get a, you know, I'll go see the doctor and they'll give me some medication. I'll go to the chiropractor. They'll adjust me and



that'll fix it. I'll get a massage and that will fix it. And while there is a place for a lot of those things temporarily. By far the research shows that these active things like education, movement, and exercise have way better evidence in the long term for, not only rehabilitation, but the kind of prehab idea of helping to prevent injuries, or I want to say prevent, because that's never 100%, right?

Like we all get injured. It's reducing the risk of suffering an injury. And so, you know, that component is so important for people to understand. And I think when you understand more about the science of pain and injury. Well, not only are you less fearful, when you do have those things come up, less anxious about what it means, you can kind of, I know for me having this background. When I have pain or an injury, most things we get are more just kind of like irritations. You know, it doesn't mean something's really torn or damaged in most cases, you know? And so when you know that and you have that mindset and you have a plan, right, anything in life that is unknown is scary. And so that's totally true of pain. When you don't fully understand it, you're more likely to be scared of it and threatened and feel anxious and fearful. And those things have been shown to actually make pain worse. A lot of times, in a lot of cases, you know, people will become more hyper vigilant, they'll stress about it. And we see that when people move from an acute pain state to a chronic pain state, there's usually those kinds of factors where there's stress, anxiety, hypervigilance, fear.

And those things kind of wind up the nervous system and make it more sensitive. So, you know, understanding pain and injury helps you reduce some of those thoughts and emotions. And it gives you a path forward. And I think because there's so much evidence for active things like movement exercise, of course, there's lots of other factors that we talk about in the book you want to think about, but because there's so much evidence for those, you can do those on your own. And if you are willing to take responsibility, you can pick up something like a book that has programs that aren't obviously aren't tailored to you specifically. It's not like I did an evaluation and gave you this program, but if you know how to modify based on paying attention to your symptoms, guidelines that are outlined in the book, you can take the programs, create programs for yourself and basically make your body more resilient, get past pain and injury on your own.

And I think that's a huge thing for people. Again, it's okay to go see a practitioner. Of course, you're not getting better. Go see someone if you want to implement some of these passive interventions temporarily. I still do manual therapy on people. I will work



on them and do things as kind of a jumpstart to get rid of, getting rid of pain. But the message at the end of the day should be there's a ton of things that you can do on yourself and those have the best evidence in the long run anyways.

**SHAWN STEVENSON:** All right. I hope that you enjoyed that first segment and I want you to keep this in mind, especially in the context of healing. If you're not sleeping well, you're not healing well. It's during sleep that our bodies release the vast majority of reparative enzymes, anabolic hormones, and this process of healing, repairing tissue, getting rid of metabolic waste. All of these processes are ramped up during sleep. So making sure that we're minding our sleep quality, it's more important than just about any modality that we can do while we're awake. So we want to make sure that we are taking care to get high quality sleep. Now, sometimes when we're dealing with an injury or dealing with pain, we can struggle a little bit with our sleep. Now, obviously there's very strong pharmaceuticals that can effectively knock us out, but. Oftentimes we don't understand it's not going to be taking us through our sleep cycles efficiently.

And we can be getting what I refer to as pseudo sleep. And it's not really activating that repair, but sometimes there's a place for that because sometimes we just need to get some sleep. But if we want to do things that can really help to cultivate high quality sleep and add a little something to the mix, as far as our nutrition, well, a new study that was published in the journal BMC microbiology sought to uncover why this renowned medicinal mushroom called Rishi, appears to improve sleep quality, even for individuals with insomnia. But, as the researchers indicate, without all of the well documented side effects seen with conventional sleep medications. The study titled, "Exploration of the Anti Insomnia Mechanism of Rishi", looked at how Rishi impacts changes at the genetic level to bring about improved sleep quality.

After their analysis, the researchers stated "Rishi mainly affects target genes in the pineal body, amygdala nucleus, prefrontal cortex, cerebellum, and other regions, which regulate rhythm related physiological processes". So Rishi is actually influencing genes in a positive way to help our bodies to sync up and to get on a healthy rhythm and not just helping people to sleep, but to go through our sleep cycles more efficiently. And so again, if you want to add something to the mix, I recommend having a cup of Rishi tea, about an hour before bed. This is one of my favorite things to do, especially if I've been under a lot of stress and I just want to get things kind of set back in rhythm. And the key here, you don't want to just run out and get any Rishi.

Okay. Sometimes people, you know, they hear this and then they'll even tag me on social media. Like I got some Rishi. They got some Rishi that very likely doesn't even have any Rishi in the Rishi. All right. There's a big analysis that came out a couple of years ago, looking at this industry, this. Booming industry of medicinal mushrooms that have been utilized for thousands of years But testing the products from the majority of companies there was little if any of the actual Therapeutic part of the mushroom in these products.

This is what makes Four Sigmatic so unique. They do a dual extraction of the parts of the medicinal mushroom that actually yield these results seen in clinical trials. All right. They do a dual extraction, hot water extract, alcohol extract to actually get the nutrients that we're looking for in these studies. All right. So again, check out their incredible Rishi elixir. And also they've got a wonderful Rishi hot cacao beverage as well. If you want to do like a little hot chocolate before bed, it tastes really good. But the Rishi itself, keep in mind, this is Rishi medicinal mushroom. If you're just doing the Rishi tea. Alright, it's earthy. Nobody said that it was delicious. Alright, you might want to add a little of your sweetener of choice, maybe a little, a couple drops of stevia or some honey or maybe, you know, cut it with a little bit of fat or if you're just into the earthiness and you respect the earth bending.

Nature of the Rishi, you know, you could just do it like that as well. But again, just want to make sure that you have these resources in hand, something that is science backed, but also utilized for thousands of years. And remember, if you're not sleeping well, you're not healing. Well, help support high quality sleep. Check out Four Sigmatic.com/model. That's F O U R S I G M A T I C.com/model. And you're going to get 10% off store wide. And they've also got further discounts on different bundles and things like that, but definitely head over there, check them out foursigmatic.com/model. Now moving on in this powerful heal faster.

**SHAWN STEVENSON:** Next up, you're going to hear from the author of the bestselling book, Body by Breath, and contributing author to the medical text, Fascia, Function, and Medical Applications. Jill Miller is a pioneer in the fields of human movement and pain management. And in this segment, she's going to be sharing why our fastest healing takes place in a state of relaxation, how to improve our bodies, quote recovery endurance, and also the most important yet overlooked muscle to train, to accelerate overall body healing. Check out this segment from the amazing Jill Miller. Whether it's

from recovering from exercise and getting that beautiful adaptation that we want. Or whether it's healing from an injury.

**JILL MILLER:** Mm hmm.

**SHAWN STEVENSON:** You share in the book that, that process is really dependent upon our ability to shift over to our parasympathetic nervous system. That's where the healing really hits lighten lightning speed.

**JILL MILLER:** Yes.

**SHAWN STEVENSON:** You talk about that a little bit.

**JILL MILLER:** Yes, I think our bodies are extremely good at going from 0 to 60 And Like, maintaining there. Like I'm a, I'm a, I'm a high stress person. I love just go, go, go. But we're not as good at going from 60 to zero, without actually having a breakdown, right? A lot of people just, they just crash. They're so exhausted. They fall on the couch with a TV on and pass out. And that's not really recovery, right? So how, how can we improve? our recovery endurance? How can we tolerate Being in relaxation states that do help with tissue turnover with the correct hormone balance with tissue repair, all of that. What can we do for ourselves that isn't just, you know, being left for dead all the time after we've burnt ourselves to a crisp? So what the book really does is it tries to amplify novel ways that parasympathetic tolerance. And so there are four main tools that I focus on: breathe, roll, which is self massage, move, and then non sleep deep rest or yoga nidra. And this is like a compound pharmacy that truly makes you feel like a massive difference, body wide difference that will end up actually making you even better at your sympathetic output.

**SHAWN STEVENSON:** Yeah. And all of this is tied to better outcomes with obviously our performance. But also, surprisingly, with our mental health, our emotional well being, we'll talk about all that stuff, of course. I want to share this direct quote from your book. You say that our bodies come wired with an exquisite relaxation response. And that's kind of counter culture, or counter paradigm, like you just said. We're really good at going zero to a hundred, or zero to sixty.

**JILL MILLER:** Sure. 120.

**SHAWN STEVENSON:** We're going the reverse is a lot more difficult, but it's not supposed to be like that. Your body actually has a system built in to kind of reverse engineer that stress. So I want to ask you about this. You say that our breath is our built in reset button.

**JILL MILLER:** Mm hmm.

**SHAWN STEVENSON:** All right, when I think of a reset button, I think of the first Nintendo. Super Mario Brothers just came out as of this recording. All right, and there was like two buttons, power, reset. Yeah. All right, but we have a built in reset button for all of this stuff, and it's our breath. Why is that?

**JILL MILLER:** Your breath will breathe for you, whether you pay it any mind or not. It's amazing. It is this completely automatic thing that's happening up to 22 times a day, depending on. But if we are able to consciously control the rhythm of our breath and the cadence of our breath and how we're breathing, you can change your brain. You can change state. And it happens within just a few moments. So there's wonderful research by, I highlight in the book by Jack Feldman, who's a, actually a local neuroscientist. He's at UCLA. I mean, he's literally like just over the hill. So Jack Feldman discovered in the brainstem, the two different places that generate inhales and exhales.

They didn't know where these were located until 1991, or they didn't know where the inhale was coming. They knew it was coming from the brain, but they didn't know exactly where in the brain stem. So he found this location called the pre Botzinger complex. But one of the things that he found was that the initiation for inhale is coming from there, but that initiation doesn't just go to the nerve that directs the diaphragm to contract. So the diaphragm contracts because a nerve called the phrenic nerve is telling it to contract the diaphragm, which is your main breathing muscle. Like any skeletal muscle, it needs a nerve to say, all right, contract now. So when this pre Botzinger complex, or when the nerves within that tell the phrenic nerve to contract, they're also sending signals to lots of different parts of your brain.

They're sending signals into areas that control emotion. They're sending signals that are also involved with the olfaction system, which makes a lot of sense, right? Our olfactory bulb. So they're going to many, many places throughout the brain, and they're also generating brainwaves. Breathing has its own brainwave oscillation that's

happening throughout the brain all the time. So it's not just affecting your ability to breathe in and out. Those brain waves are doing things to different parts of our brain. Right now, nobody really knows what those things are, but it seems pretty important that for some reason it's kicking off these waves that are happening all over the place globally. But one of the things that we know is if you change the rates of inhales and exhales, and there, there, there are a number of studies that have looked at them, but not. They we still need a lot more breath science and I think we're in the new age of a burgeoning time of breath science to be able to learn more and more.

What are the ideal patterns that help certain individuals? And obviously there's never one thing that works for everybody. But you can change your moment to moment experience by adjusting how it is you're breathing. And that's really, really powerful. But I don't want you to get lost in your head about breathing because breathing is a body wide experience, which is why I wrote the book body by breath, not brain by breath. I mean the brain is super important, but breathing is really a body wide experience that affects literally every system and structure of your body.

**SHAWN STEVENSON:** And so, I want to ask you about this because this is very likely the most important muscle that we don't train, the most important muscle that we're not really informed on. This might be the most important muscle. And you said it already, the diaphragm, all right? So please give us a masterclass understanding on the diaphragm as a muscle.

**JILL MILLER:** The respiratory diaphragm is, in my opinion, the most significant skeletal muscle in the human body. It is the hub around which all of your body orchestrates itself. It's this odd shaped trampoline like semicircle. locked into your rib cage. And if you've ever eaten skirt steak, by the way, you've eaten cow diaphragm. So that might be a reference point for some people. If you know that they're meat eaters, right? Skirt steak. It looks like a skirt. It looks like a big hoop. And you have a right sided and a left sided diaphragm. You have Right side ribcage, left side ribcage. So we have a little bit of difference on the right and left side, just to accommodate the shape of a liver. On top of your respiratory diaphragm is your heart. Your heart sits directly onto what's known as the central tendon of the diaphragm.

So, as you breathe, your heart is always going along for a ride with the diaphragm. The diaphragm also attaches to your lumbar spine. And so a lot of people with low back pain, one of the very conservative and smart things to start doing is to do

breathing because of that relationship. But the diaphragm is attached to so many different tissues, both above and below, that are instrumental in generating core strength, postural integrity. The diaphragm itself is a passageway. I mean, diaphragm actually means partition. And so it's a, it's a passageway that allows for the input of food to be able to go down into this sort of, I don't want to say dirty, nasty area, but you don't want all this stuff coming up and getting into your lungs.

So the diaphragm acts as a partition and a passageway to separate lungs and heart from visceral organs. The diaphragm is also a pump. It is constantly moving down and up as you breathe. And this pump action that the diaphragm has, it's like bouncing your organs below it. By the way, if your diaphragm weren't there, Your organs would just kind of float up into your throat and out your eyeballs, it would be a mess so the diaphragm acts as a, as a gatekeeper to make sure that your organs stay where they need to be. And of course, if anybody is listening has a hiatal hernia, you know how problematic it is when your organs start to float up within the diaphragm, your stomach puches up and it's a miserable condition. So the diaphragm helps to generate force for pushing matter out. Right? So we use it to bear down, to have our bowel movements, we use it to urinate, we use it to cough, to get things out of our lungs. So it's moving stuff that's in the visceral region out into the toilet, but it's, or a baby out into the world, right?

Or it's generating forces that can help move fluid out of the lungs. And obviously the diaphragm became very important in the last three years when people were having this, you know, insane amount of lung infection due to the pandemic. So, one of the really cool things about the diaphragm, I think that everybody should probably know is related to aging. So your diaphragm is equipped with some of the most special muscle fibers known to the human body. I mean, your, your diaphragm is the one skeletal muscle that will go on contracting, even if you're passed out drunk, even if you fall asleep, it has to keep contracting. in order for you to stay alive.

There's no other skeletal muscle you have that's going to do that for you. So it has these very specialized fiber types that are so enduring, but it also has fast twitch muscle fiber types, um, that help for generating tremendous force. For example, in the case of childbirth, I mean, we always think of the uterus, but You know what's upstairs of the uterus? Your diaphragm is contracting like crazy to help push the baby out. But you can't feel it. That's the thing about the diaphragm. It is devoid of sensory receptors. In fact, there's only about six of them and they're located in the crura. the.

the parts that connect to your lumbar spine. So you can't sit here right now, Shawn, and tell me where your diaphragm is.

You can tell me where your bicep is. You can take your mind and you could crawl it to your biceps. And you're like, I know where my bicep is. I can tell how much, how short it is. I can tell how long it is, but you can't sit there and sense the location of your diaphragm. You were created in such a way that you don't have to worry about the 22,000 reps a day that your respiratory diaphragm does. And that can be problematic because if your diaphragm is not, well, this is where I'm going to get a little bit. On the body by breath, your diaphragm may not necessarily be optimally being used in your body because of injury, because of the habit of posture or because of our own emotional stuff. We may be short training our diaphragm from full range of motion and our diaphragm can be better optimized, I'd say.

I mean, culture has kept our bodies in chairs and in front of computers, and we are more in a C shape now than we are in an S shape for the most part. And your diaphragm, I mean, you can breathe around that. Your airway will adapt to any shape. That's the amazing thing about this castor within your ribcage. It can accommodate any shape and I can still breathe, right? But I probably don't have many options if I'm stuck in a single shape all the time. If I don't spread that tarp, spread the trampoline in all of the ways that it can move. Pressure on parts is a very valuable therapeutic application. What I mean by that is self massage.

So, the, because we have been so, like, the brain is everything and all your thoughts and all the things, but as I illustrate with my own story, I was, I was a talking head. I mean, my body was moving. I couldn't feel most of it. And so I needed. And I think many people need something to illuminate the experience of sensation. Your body thinks and feels. You are a sensational being. We have so many sensory neurons throughout our body that are helping our brain to orient us to our environment. Recently there was a recalculation of. The number of sensory neurons in your fascial tissues. So previously, they thought there were maybe about a hundred million sensory neurons in your fascia.

And your skin, for comparison, has about 200 million and your eyes have about 150 million sensory neurons. But this recalculation which was done by this researcher, Martin Grunewald, basically concluded that there are 250 million sensory neurons in your fascial tissues, providing feedback about, well, about the proprioception and



about the interoception and about temperature and pain and all sorts of things. These things terminate in your fascial tissues. Even when you have terminations, obviously, I mentioned the eyes, the skin, there's terminations in lots of places, but makes our fascial tissues the largest sensory organ we have in our body. And so, you know, your, your brain is everywhere in your body, right? I mean, it's calculating it up here, but my body thinks it feels.

My body thinks by feeling. That's how my brain gets its and that's one of the messages that I, that I broadcast in the book, your body thinks and feels. And if we're cut off from feeling, we're really trapped. We're really trapped in our head and isolated from ourselves. So using tools to pressurize, to agitate, to traction, to promote touch brings back to sensation, to be, to being a somatic being instead of just being a heady, think any being all the time. Doing the work of truly refilling our, our souls and our pictures and our physiology, it's actually very, very simple to do that refill. And I outlined it in the book. It's called the five P's of the parasympathetic nervous system. This is the ability to build tolerance for parasympathetic state. Many of us are running because we're running from something or we're afraid of something.

The ability to not just to stop and be still because stillness can be terrifying to many bodies, especially bodies that are running, running scared, or running toward. It's not just running scared. We're also running toward. We have ambitions. We have goals. There's this phenomenon called relaxation induced anxiety that I discovered a few decades ago, and it just stuck with me. I was like, wow Relaxation induced anxiety. That's the phenomenon when you start to go into relaxation states where you start to get anxious about letting go about your vulnerability. Sometimes Savasana or corpse pose, you know at the end of the class, they can't be still, they're fidgeting, their eyes are opening, closing. That's when the pain starts to set in for some people.

When they start to get still, when they're finally still, all of the things that have been submerged during all the action, it becomes visible, it's uncomfortable, it's untenable. Relaxation induced anxiety, there's some estimates that between 17 and 53% of people experience this, which I think is why meditation hasn't really stuck in the general population because it's uncomfortable. So how do we help bodies that are, that seem meditation resistant or relaxation resistant? How do we help them to find a way to refill? And I think these five Ps are a really good formula to help. Not only those bodies, but the bodies that like stillness too. And those are, the five Ps are, number one is perspective, and perspective has to do with mindset. Mindset. and those are

throughout the book, and *Body by Breath*, I have dozens of them, but one of them is, all of me is welcome here. That includes the anxious part of me, the part that can't sit still, you're welcome here too. Come here fidgeter, we're gonna hang. You wanna fidget? Let's fidget. The second P is place.

Ideally, to truly relax. The place needs to be safe. Now in the throes of a stress moment that can happen, you know, on the street, it can happen on the airport, it can happen, you know, on the airplane, I was on the airplane yesterday, hitting a lot of turbulence. I was like, okay, This is a safe place. Didn't believe it at all. Right? But I had to go through, I was like, okay, let me think of the physics of clouds and airflow and the airplane wings. I literally had to go there to make the place safe for me. So ideally the place is a sanctuary. Like it's where you feel at peace. That could be outside, it could be inside. For true relaxation, physiologically it should be warm.

It should be a little bit dark. It should be quiet. The third P is position, and I don't mean posture position. In terms of your physiology, where are you going to find the greatest relaxation response? Is on the ground, is laying down, or slightly in a gentle slope, a little bit reclined. So, there are a number of positions you'll see throughout *Body by Breath* where I have the pelvis is lifted up on a block or on a gorgeous ball so that you create what's known as the baroreceptor reflex in your body. And that is a, helps the vagus nerve to come online and tamp down on sympathetic outflow. So you've got perspective, place, position. Now the fourth P, we didn't even get to this till now, is pace of breath. So pace of breath is how you're organizing those breath reps that you asked me about so early in our conversation.

Ideally, your exhale is longer than your inhale. Now there are paradoxical breath strategies you can do where you load your inhale but for the just grand scheme, your exhales are longer than your inhale, that helps the vagus nerve to come online. And then the fifth P is palpation. Obviously I use role model balls, but palpation means you are using something or even your own hands to press to conform into different spots on your body. And ideally there are these spots within the axis that I identify that are these the vagal portals of pressure that really help the vagus to also become more and more dominant and to quiet the sympathetic nervous system, to quiet these unknown braces, these unknown barriers to relaxation.

**SHAWN STEVENSON:** All right, let's keep this party going. Next up, you're going to hear from an expert who's sharing the specific forms of exercise proven to prevent and

accelerate recovery from injuries. Also, you're going to learn why exercise helps to accelerate healing. What's actually going on behind the scenes with this whole process. And this expert is somebody that, you know, them, you love them. It's the author of the USA today, national bestselling books, eat smarter and the eat smarter family cookbook back to back, back to back! Like the cover of lethal weapon. All right. The author of the international bestselling book, sleep smarter. And the host of the model health show has been featured as a number one health podcast in the United States many times. I'm talking about yours truly. All right. So this was from one of my all time favorite episodes that we've done recently. And again, these are looking at some of the behind the scenes. Why does exercise actually work to accelerate healing? And again, the specific forms of exercise proven to prevent and accelerate recovery from injuries. Check out this segment from the host of the model health show, Shawn Stevenson, aKA me.

Accidents and injuries happen in both younger and older demographics, but consistent exercise is proven to reduce the risk of injuries and accelerate recovery when injuries do occur. Now, does exercise provide a science backed defense? A meta-analysis of 25 randomized controlled trials published in the British Journal of Sports Medicine found that specific forms of exercise, those being proprioception training and strength training, can reduce approximately two thirds of sports injuries. Reduce two thirds of all sports injuries if those types of training are utilized consistently. And the researchers found that overuse injuries could be nearly cut in half by utilizing those two forms of training and proprioception training. If you're wondering about that, we're going to talk more about that later in the show, but proprioception is your body and nervous system being able to navigate your body.

Navigate your body in space and training specifically so that your body is adapting to the conditions that you're putting it under. And so again, we'll talk about that a little bit later and how to do it because you definitely want that in your superhero utility belt. So does exercise provide science backed defense against injuries? Yeah. And also another study, and this was looking at the influence of exercise and injury healing of older adults aged 55 to 77. And this was published in the journals of gerontology series A. They had 28 participants and they split them into an exercise group and a non exercise group. Then the researchers essentially stabbed the study participants to see how fast they'd heal. Guess what? They didn't. Okay. Stabby. This reminds me of Harlem Knights. She was like fighting with Eddie Murphy's character. She's like, nah, I got to cut you. But they, they gave him a little, a little wound, a little, a little cut. They

didn't just come, you know, like scream, stab them, but just gave him a little, a little, a little cut.

And interestingly, they had the exercise group begin exercising three times a week for a month prior to cutting them and then had them continue their exercise program afterwards. All right. So they got them fitter first. So they're already in motion, right? They're exercising three times a week prior to stabby, prior to getting this wound. Now, after compiling all the data, the exercise group healed about 25% faster than the non exercising control group. Don't you want to heal faster when sh\*t happens? Don't you want to heal faster? Being fit is a superpower in this context. Now, the question is, how does it work? Well, number one, exercise is a key driver of circulation, right?

So our cardiovascular system, blood is providing oxygen and nutrients that aid in repair. Movement delivers nutrient rich, Blood supply to the site of an injury. It's just what it does. It's what your body does when we're moving. There's this wonderful statement in higher echelons of physical therapy that says motion is lotion. Motion is lotion. Where there's another guild of, you know, injury treatment that's just like, don't do anything. Just like kind of debilitate to an organ, a tissue, a side of the body that's injured and don't move it at all. When in reality, not doing anything is one of the worst things you could do. Now, this doesn't mean if you have a severe leg injury that you go and you're doing box jumps and squats, all right, back squats. It means that do what you can. If you can get some steps in, if you could do a stationary bike, if you can work on your upper body, do what you can to get some blood flow, to activate Those myokines. And again, your muscles are an endocrine organ. It's going to help with pain. It's going to help with the adaptation.

It's going to release anabolic hormones that help to repair things like HGH. The list goes on and on a lot of benefits. So number one circulation. Another reason why exercise is so effective in preventing and also accelerating the healing of injuries is waste removal. Via the lymphatic system, via our blood, via our eliminatory organs. Your lymphatic system is your Extracellular Waste Management System, and it's a site for a lot. The immune response, the inflammatory response of our body, that's the immune system. So when you have an injury, your immune system is there to take control and kind of recruit all the elements in order to heal.

That they create the inflammation calling in the troops. And so to help the flesh out metabolic waste, your lymphatic system is going to be important in that. And your lymphatic system doesn't have a pump like your circulatory system does. And so your moving is required in order for you to move out the garbage. All right. So again, waste removal. Another aspect of why exercise is so important in this particular regard is the production and release of stem cells, the journal of muscle research and cell motility affirm that exercise can boost the supply of adult stem cells. Now what does stem cells do? Stem cells become whatever you need. Stem cells become, if you need muscle fibers, if you need new tissue for your meniscus, right? Stem cells have the capacity now with adult stem cells are more specialized, right? They're not like totipotent and pluripotent stem cells that we talked about with Dr. Bob Hariri in a previous episode. He's one of the foremost experts in the world in stem cells.

Put that for you in the show notes, but there's a lot of capacity with adult stem cells. And again, you're not going to be secreting. You're not going to release. You're not going to bust out your stem cells. If you're not moving your body in particular, weight bearing exercise really helps with the release of stem cells. Another reason why exercise is so important and valuable with accelerating the healing from injuries and preventing injuries is the myokines. Going back to the myokines. Research published in advances in clinical chemistry states, quote, exercise induced to myokines can exert an anti inflammatory action that is able to counteract not only acute inflammation due to an infection, but also a condition of low grade inflammation. All right. So effective against infections. Effective against inflammation from an injury. Myokines are that deal.

All right. I hope that you're enjoying this compilation to help you to heal faster. We've got two more amazing experts in store for you. And I want you to keep in mind that every cell in our bodies, whether we're talking about the building and repairing of cells, the elimination of waste products, and the treatment of cancer. Every single process happening in our bodies is dependent on the nutrients that we're providing. Our cells are literally made from the nutrients that we're giving ourselves. And there are certain nutrients that are just proven to go above and beyond when we're talking about recovery. In fact, a study published in the Journal of Applied Physiology showed that beet juice.

All right. Beet juice boosts stamina up to 16% during exercise and training. Plus now here's the most important part. The participants healed faster. They experience less

muscle damage and less fatigue after exercise. Now, it's also well established that beet juice is very protective in healing and supporting the function of the cardiovascular system. A randomized, double blind, placebo controlled study analyze the effects of beet juice on blood pressure and endothelial function of older adults. At the end of the four week study, the results demonstrated that the participants receiving beet juice had significant improvements in blood pressure and large vessel endothelial function.

It's healing from the inside out. Now, when you combine beet juice with blueberries, which researchers at the University of Michigan have found that blueberries, compounds in blueberries have been found to directly target fat cells. Combine that with pomegranate. With acai all of these incredible superfoods all organic, all free from processed sugar is found in the organifi red juice blend Pop over there and check them out. You get 20% off. They're hooking you up with 20% off, go to [organifi.com/model](https://organifi.com/model) right now. That's [organifi.com/model](https://organifi.com/model) for 20% off their amazing red juice blend. All right. Check them out. Now add that to your healing and recovery protocol, your performance protocol. And now let's get to our next incredible expert in this heal faster compilation.

**SHAWN STEVENSON:** Next up, we've got one of my all time favorite shows, one of my all time favorite guests. She left a lasting impact on my life. I refer back to her book frequently. Such a joy to have her here. I'm talking about Dr. Ellen Langer. Now Dr. Langer was the first woman to be tenured in psychology at Harvard University, where she is still a professor. And she's been the recipient of many of the most distinguished awards in psychology and research and publications. And she's the author of multiple bestselling books. And she's actually known worldwide as the mother of mindfulness and the. Mother of positive psychology. She's been working on this for decades.

Her first experiments were done in the seventies and. It was just such an incredible experience. As I mentioned, she's such a wealth of knowledge and just being again, able to aspire to people who figured some things out, you know, it's not just. This information that she has, it's her energy and she was just radiant. She filled the room and in conversations about longevity and having a healthy, happy life, we want to learn from people who've figured some things out. And she definitely has not just from her. research, but being able to share the space with her and to see it for myself, it's, it was really awesome. And so in this segment she's going to be sharing the fascinating science showing how your mindset and your beliefs impact your healing

process. And also how having a positive mindset about healing helps you to organize yourself better, helps you to organize yourself better. Really powerful stuff, this and more. Check out this segment from the amazing Dr. Ellen Langer.

**DR. ELLEN LANGER:** There is the most recent mind body unity studies that we ran, and did this with Peter Ungl, my graduate student. So, we take people and we inflict a wound. Now, I'm not sadistic and even if I wanted to really hurt you, the review committee isn't going to let me. So it's a minor wound, but it's a wound. And people are in front of a clock and for a third of the people, again, unbeknownst to them, the clock is going twice as fast as real time. For a third of the people, it's real time. For a third of the people, it's half as fast as real time. Most people would assume the wound is going to heal when the wound is going to heal, right? Based on, quote, real time. But that's not what happens. What happens is the wound heals based on perceived time, the time the clock tells you, right? So, clearly, people are healing themselves faster. And I think that the medical world, you know, when, when you, if you were to break your leg or something and you ask the doctor, you don't even have to ask, they'll volunteer the information, how long it's going to take you to heal. They give you the outer end. You know, and I think that people should be told. The fastest healing that we know of so far has been so that you organize yourself differently. You know, when, when you're expecting it to take forever, you don't pay any attention to it really. And there are things you can attend to, to increase the healing process.

**SHAWN STEVENSON:** It's, Interesting. I have a close proximity situation. Last year, I tore my calf muscle and the prognosis was four to six weeks to return to normal activity. And I did it in three weeks.

**DR. ELLEN LANGER:** Yeah.

**SHAWN STEVENSON:** I was, you know, doing squats and lunges and all the things. And what I share with my audience, and also, funny enough, I was doing a talk in Mexico, um, shortly thereafter, and talking about some of the benefits of being fit and whatnot. And there is some data affirming, you know, if you are fit and you do have more resilience against injury, you recover faster. But. The most important thing was my thought process because I immediately, as soon as I heard the prognosis, I was like, I'll do it faster than that.



**DR. ELLEN LANGER:** Yeah. No, that's, that's beautiful. And that's the way we should all be. I smashed my ankle years ago. Didn't break it, smashed. And, the doctors told me that I'd never walk without a limp. Now, I don't really listen, so I didn't, I didn't remember that they told me that. And, you know, it hasn't affected my tennis or anything else. You know, I don't have a limp. What people need to understand is that medical science, like all science, depends on experiments that can only give us probabilities. If you run an experiment and you do the exact same thing again, which you can never do, exactly the same thing, you're likely to get the same findings. Those probabilities are translated as absolutes. All right, so if most people take four weeks to heal, doesn't mean all people take four weeks to heal. And this came home to me. Years ago in the oddest situation, I'm at a horse event and this man asked me if I'd watch his horse for him because he's going to get his horse a hot dog.

I'm a straight A student. I'm the one you hated. You know, I mean, I memorized everything. I know horses don't eat meat. And I had to keep myself from laughing at this man. He comes back with the hot dog and the horse ate it. And I loved it. Most people, you know, so I knew that everything I thought I knew could be wrong. But the reason I loved it is that opened up a world of possibility. And that means everything that we know, uh, can be otherwise.

**SHAWN STEVENSON:** So this is really bringing to bear, and I, and I want to encourage this in everybody. And this is something I try to do frequently, and also myself, because you can catch yourself being the expert.

**DR. ELLEN LANGER:** Sure.

**SHAWN STEVENSON:** You know, but really bringing a, a mind of curiosity, a childlike mind to things. Yeah. And resisting being the expert who knows this is what it is, this is how things are, and start to notice that in yourself. And because when you do that, you start to miss out on this vast spectrum of possibilities. Because as you just said, know to Studies, even, are ever the same. It's impossible.

**DR. ELLEN LANGER:** Exactly the same, right. No, that, essentially, the medical world gives us best guesses. And those best guesses are accepted as absolute fact. And there are some things that some doctors say, not the best doctors, but that I can't agree with. In today's world it's just mind boggling to me that they would tell you you have six months to live. There's no way they can know that. You know and there are

lots of things that are done that I think are implicitly following the hanging crepe philosophy. Do you know what that is? Many years ago when somebody was dying they'd hang black crepe. And so the hanging crepe philosophy is I could tell you you're going to die, I could tell you you're going to live. If I tell you you're going to live and you die, I'm going to get sued. If I tell you you're going to get, you're going to die and you live, you thank me. All right. Basically. And so they were by nature, taking the more, limited view, the more negative view. Now that we know that these things become self fulfilling prophecies. You know, you don't have the right to lead somebody down a path that's actually going to cause them harm. And that's the message for people to know that we cannot know whether something is possible or impossible. But if you don't try clearly, then you're not going to, exactly. Yeah.

**SHAWN STEVENSON:** You're welcome. You know, and also, this is, I'm just, again, I'm holding back my excitement.

**DR. ELLEN LANGER:** Don't hold back.

**SHAWN STEVENSON:** All right. F it. Here we go. So, this is, especially today, putting this in the context of how we perceive aging.

**DR. ELLEN LANGER:** Yeah.

**SHAWN STEVENSON:** You know, there's a big change that's taking place right now with certain guilds of people who are aware of this. But you have one of the coolest studies on elderly men. Let's talk about that.

**DR. ELLEN LANGER:** Okay, so this was the first test of the mind body unity. Do you remember we take the mind and body, we put them back together in our minds, then wherever you're putting the mind, you're necessarily putting the body. So we took old men, this is back in, I think we ran this in 1979, so quite a while ago. And what we were going to do was to have them live as if they were their 20 year old younger selves. Okay? And, they lived in a retreat that was retrofitted to 20 years. It wasn't quite Hollywood. I didn't have the budget for that, but anything that was a marker of it being today was removed and replaced with books, magazines, and posters, everything from the past and, to talk about past events as if they were just unfolding.

So as well as we could, we went back in time for them. As a result of this, it was remarkable. As a result, the hearing improved. When have you ever heard an 80 year old's hearing improve without medical intervention? Even with medical intervention. Their vision improved, their memory improved and they look noticeably younger by the end. And so that was the first, it was exciting and reason to continue with all of this. You know, but I had a personal experience that was driving much of the research. So my mother had breast cancer and it had metastasized to her pancreas. That's the end game, right? So because it was the end game, her muscles weren't exercised while she was in the hospital and people wrote her off.

Then, It just disappeared. It magically disappeared. And I think that spontaneous remissions are not nearly as infrequent as the medical world might have us believe. I'm not sure. I haven't You know, questioned enough medical people to know what they believe. But the common view is we're not going to study it. It's hard to study and it rarely happens. But you can imagine all of the people who don't have access or desire to come to the medical world. That, you know, a tumor is there. They don't even know it's there and the tumor is gone. We don't know how often that happens. With or without them taking any action to make themselves better.

But I think that if you believe that, there's nothing you can do. To help yourself, then you're not going to do anything And if you believe that you're dying the system starts to turn itself off. And that we can exert enough control just by assuming that we're going to be better. You organize yourself differently. You know, you're more mindful and I've got four or five investigations showing that when people are more mindful they live longer.

**SHAWN STEVENSON:** All right. We're at our final expert in this faster compilation And I've got a question for you. What about advanced injuries and diseases that would often require things like invasive surgery? Well, today we have an emerging field of regenerative medicine that's addressing these things with often non invasive or minimally invasive treatments. And on this next segment, you're going to learn what regenerative medicine actually is. Also, the recent discovery that won a Nobel Prize affirming that we can actually make our cells and tissues younger and the implications it has for the future of health and healing. And for this, we've got the amazing Dr. Adeel Khan. Now, Dr. Khan is a board certified physician specializing in regenerative medicine, and his groundbreaking treatments are now being utilized by professional athletes in all sports and also some of the most recognizable people in personal

development. Sports performance, the list goes on and on folks like Tony Robbins, for example, are his patients and he's truly leading the field right now in regenerative medicine and his insights learning directly from him is an incredible gift for all of us.

So again, where do we turn? What resources do we have when we have advanced injuries and other conditions where we've tried a lot of things and we haven't really figured things out? Well, this is another incredible resource to have in your superhero utility belt. Let's check out this segment on regenerative medicine from Dr. Adeel Khan. First and foremost, what is regenerative medicine? And let's just start there.

**DR. ADEEL KHAN:** Yeah, at a very high level, it's basically just repairing or regenerating tissue back to a previous state. So you're basically trying, if your body's in a degenerative state or if there's some sort of damage, you're trying to take that back to the way it was. So the perfect example is like a tear in the muscle or tendon. So instead of getting the standard of care would be like surgery, like you have to go get surgery, you sew it back together and then you're kind of on your way. So instead of having to get surgery, is there something we can do to kind of manipulate the body so that it will heal?

And obviously this was a huge promise, like, even like 30 years ago is when it really started, like, Dr. Arnold Kaplan, who recently just passed away, he was the one who coined the term mesenchymal stem cells, which we'll chat about, but he was kind of like one of the godfathers of regenerative medicine. And so it was this whole promise that, hey, we can actually repair tissue instead of just having to cut stuff out or take this pill or just mask it. So it's this amazing idea. That instead of having to take a pill to mask something, or just having to cut you open, that we can actually get your body to heal.

**SHAWN STEVENSON:** Alright. So, first and foremost, our body, in many ways, it already knows what to do to fix a lot of problems. But it's having the right conditions, and the right...

**DR. ADEEL KHAN:** Signals.

**SHAWN STEVENSON:** The right signals, exactly. And so, With this being said, let's talk specifically about an injury. All right. So say somebody has a chronic shoulder injury that, you know, they've tried all this different stuff and they're just not getting better.

This is often times when people come and see you. Yeah. So let's talk about what you do versus a conventional approach.

**DR. ADEEL KHAN:** Yeah. And I mean, the reality is I treat a lot of high end pro athletes as well, like NHL, NFL players, stuff like that. And they have the Their own team doctors that are orthopedic surgeons. But what's a surgeon gonna be good at surgery? Yeah, everything looks like a nail when all you have is a hammer. So unfortunately, this field of regenerative medicine is becoming its own specialty, meaning it's evolving so fast that they can't keep up and they don't, they don't really know what's going on and they don't know the nuance. So a lot of times they brush it off and just be like, Oh, well, if you have this chronic pain, the standard kind of orthopedic surgeon will say, Okay, try cortisone, which is an anti-inflammatory drug. If that doesn't work, you can take some anti-inflammatory medications and then just kind of manage it with physiotherapy.

And if after like three, six months, it's not getting better, then you can do surgery. So that's kind of like the standard of care. It's still pretty, that's still pretty the standard approach. And, but then there's this kind of huge gap of patients that aren't getting better with physio, and then the don't necessarily want surgery. Plus, I think they deserve access to an option that is viable. And so that's where we come in and we say, okay, is there something we can do to get the body to heal on its own? And you've, you told me your story earlier, like you did it just with nutrition and movement. So imagine what you can do when you're actually sending signals, like the actual raw ingredients in there to kind of help your body to heal.

A lot of times we'll do our own assessment with ultrasound. I think the best story I like is when I went to the first time I went to Dubai was to treat this man named Muhammad Alibar. He's the owner of the Burj Khalifa in Imar property. So he's, he owns the six tallest buildings in the world and he's, You know, the wealthiest man in Dubai, business wise. Obviously there's a royal family and stuff like that, but he's well connected with all of them. So he flew me down because he had the shoulder issue for 20 years. And it was the same, same story, right? Cortisone, orthopedic surgeon, blah, blah, blah. And so he was kind of like, Can you fix me? And I'm like, pretty sure I can.

And so we did an ultrasound, assessed it, we found some partial tears, and then we just used platelet rich plasma injections to fix it. And for a lot of tendon and muscle tears, PRP is, works great. It's just where we take your blood. we concentrate it. but

there's also nuance in PRP, which is the problem. There's different ways to prepare it. How you, how you, how fast do you spin it? What temperature do you do at it? Because it changes the cytokine profile, which are the growth factors and anti-inflammatory signals. And I was fortunate because I got trained by Dr. Anthony Gaglia, who was kind of the godfather of PRP. He treated like Tiger Woods, A Rod, lots of people, and he was the one who actually invented PRP for musculoskeletal conditions. Like he actually was the first one in the world to do it. So obviously he's, I learned from him, and so I got to learn about the nuance of how to prepare PRP. But that was just like, a simple case where you just need the right signals.

The body, once you give the right signals, because the plasma, what is the plasma? All it is is growth factors and cytokines that are just telling your body, okay, it's okay to start healing now. So there's stem cells that, from the endogenous area, start coming in. There's signals that start coming in and start repairing the tissue and then yeah, and then he was, you know, he's pain free now and he's good. And I, you know, his wife also had a similar issue in her knees. So, you know, they were obviously, you know, like, what the heck, how come we never had access to the, and this man also has access to it and pretty much any doctor in the world. Right. So it's like, if he, if he was struggling with this for years, it's really hard for a regular person to know how to navigate the system.

**SHAWN STEVENSON:** And that, I would imagine that's a pretty high stakes situation.

**DR. ADEEL KHAN:** Just a little bit. If you screw up, you may, you may not return.

**SHAWN STEVENSON:** Wow, man, that's, that's really remarkable. You know, again, like having access to, you know, all these different treatments, but in, in trying so many things and just struggling, what, what can block somebody from healing? You know, when it comes to these signals, being able to do what, what they're able to do.

**DR. ADEEL KHAN:** Well, that's, yeah. And that's always fascinated me. It's like, Your body has this innate ability to heal, as you've seen yourself. But what is, I think it's a combination of genetics and obviously the inputs you give it. Because if you're not putting the right food, you're not doing the right movement, and then there's always going to be just that factor of just, we don't fully understand, but most likely, there's some genetic pathways in terms of regenerative medicine pathways, because there's all these different pathways that signal and tell your body to heal. Like there's a

pathway called the Wnt pathway, W N T. But maybe there's some people who have genetic polymorphisms or some sort of variants that just don't allow their body to heal as well as other people's body. Because I have some patients who just, you know, they're so fragile. And they just don't heal from any, it's just so far, and they eat well, they exercise, they do all the basic stuff. But for whatever reason, their body just doesn't heal well. And so we have to, oftentimes we're working with those patients, whenever they get tears, they just don't heal, and we have to help them to heal.

**SHAWN STEVENSON:** All right, so you mentioned PRP being one possible treatment, but you and we talked a little bit about this before we got started are somebody who's really at the forefront of understanding this and it's super exciting. I actually did a lecture on this at my university. The university I graduated from for their biology class, like 10 years ago, talking about stem cells.

**DR. ADEEL KHAN:** That's so cool.

**SHAWN STEVENSON:** You know, I was talking about, you know, totipotent stem cells and pluripotent stem cells and all these different things. Just what we knew at the time, but there wasn't any. There wasn't any valid interventions in medicine at the time to really talk about.

**DR. ADEEL KHAN:** Yeah.

**SHAWN STEVENSON:** But we've come so far. Can you talk a little bit about that?

**DR. ADEEL KHAN:** Yeah, it's exploding. And so, I think for people to understand, because stem cell is such a blanket term, and there's different type of stem cells. So, first, just the broad definition of a stem cell is something that can divide and potentially turn into different types of tissue and help to repair tissue. And the, the cool thing about stem cells is obviously their ability to regenerate new tissue and, but the issue is there's, there's so many different types. So there's embryonic stem cells, which come from an embryo and that's kind of like in the Bush era, there was a lot of controversy because obviously if you're taking them from embryos, that's very different. And a lot of people still think like, you're like, Oh, so you're, You're taking, are you taking, they still think that, you know, there's still a misconception. We're not taking them from embryos, we're taking them from umbilical cord tissue because that's a very rich source of what are called mesenchymal stem cells.



And mesenchymal is just an embryological term, but the point is, these mesenchymal stem cells are still very pluripotent, meaning they can differentiate into different types of tissue, but they're not totipotent, meaning they can't turn into any type of tissue. So there are certain cell lineages where they have a propensity to differentiate into. And typically that's going to be like cartilage, muscle, tendon, bone. But that, but we still use it for other organ systems, not because we're trying to necessarily re, we know it's not going to regrow, You like a new pancreas, but what it can do is it can improve the microenvironment and allow your body to improve that chronic inflammatory process that's causing that degeneration in the pancreas with like type two diabetes.

That's why there's been trials done where you inject just mesenchymal stem cells into the pancreatic arteries and patients can actually get off insulin. And we've had, we've, we've, we've treated patients with that too, with type two diabetes, but so mesenchymal stem cells have this amazing ability to heal. And reduce inflammation, but then it's like, okay, can we engineer these cells to control the signals? And this is, this is the part that I'm really excited about, it's called synthetic biology. So meaning instead of just taking umbilical core stem cells and manufacturing them and then injecting them in, we actually genetically engineer these cells in the lab.

And then we, how we do that is using skin biopsy. So we take a skin biopsy from a patient. It can be from your own body or it can be a donor. Okay. And then we use cellular reprogramming. This is kind of like the reset button on the cell. It's called the Yamanaka factors. And Professor Yamanaka was a Japanese Nobel scientist. And the reason he got the Nobel Prize is because he figured out these are the four transcription factors. If we overexpress them, you can turn any somatic cell, so you can take any muscle cell, fat cell, skin cell, and you can turn it back into a baby stem cell, which is embryonic in nature. How crazy is that, right?

People, it's always hard to comprehend. It's like, wait, you mean I can turn anything in my body back to, like, a baby again. Like, essentially, that's what he did, that's what he discovered. But the problem was with these, what they're called induced pluripotent stem cells, or iPSCs, and, or I like to just call them Yamanaka stem cells, easier to remember for people. So these Yamanaka stem cells, the problem was they're embryonic, so they're too much stemness, meaning they can turn into tumors, or they can keep growing. And so this issue in the last five years has been, how do we use these cells clinically? without causing tumors. There are still people using them, but I

would caution to be careful just because there's always that risk of these iPSCs or Yamanaka stem cells to keep on growing uncontrolled, like uncontrolled proliferation.

So, what we're doing is we have this unique cell line that has a gene edit, to prevent uncontrolled proliferation. So these Yamanaka stem cells will not grow into tumors. And that's the patent technology that we've partnered with the company for. And what we can do is we can take these Yamanaka stem cells and we can turn them into different cell lines, and then we can control them. So we can almost control the signals that they're going to send. So instead of just being like, umbilical cord stem cell, we can control the signals that they're going to send. So for example, we're working on making a mesenchymal stem cell, which That's specifically going to target aging by targeting the inflammasome.

So this is, it's genetic engineering. And then we can also create beta islet cells for the pancreas. That's already been done in clinical trials. There's, there's I, there's what's called IPSC derived dopamine producing neurons, which can be transplanted into the brain for Parkinson's. And that's, that clinical trial was published this year. And the results were amazing. Patients actually go into remission, and you actually get growth of new neurons. So you're actually treating and reversing disease. You're not just saying, okay, well, I guess you have Parkinson's, so take this pill for the rest of your life. So that's why it's such an exciting field. So, so it's kind of this intersection of cell therapy and gene editing and gene therapy coming together for kind of that next generation of cell therapy.

**SHAWN STEVENSON:** And this would, I would imagine, be a much more lasting treatment versus, you know, something, again, you got to take a pill every day or whatever the case might be.

**DR. ADEEL KHAN:** Yeah. Because you're actually repairing the tissue and you're regrowing new tissue that's going to be permanent and it's engrafting. So it's, it's this, and this is already happening and this is just the beginning. So imagine where we're going to be in like five years or 10 years. It's going to be amazing for people with chronic illness.

**SHAWN STEVENSON:** All right. So, I want people to really get this. So essentially the data or the signaling, which. Once you said this just now, it just makes complete sense because, you know, we're so fascinating. Life is so fascinating. But there's data when

we're born, there's data in our cells, in our genes, to make an adult. The data is there, right? But it's just a matter of signaling. It's a matter of, I would imagine, you know, certain things getting read a certain way. The same thing holds true as an adult. There's data there for a younger you and you are talking about innovations that can read that data to control the signaling to start to basically print younger copies of ourselves. Is that right?

**DR. ADEEL KHAN:** Yeah, yeah. And that's the holy grail, I would say, of anti-aging medicine would be epigenetic reprogramming, which means basically, imagine one day we can just reprogram all your cells back into a younger state. Which is not science fiction. Like, I think that would happen at some point. For now, what we can do is we can still infuse these stem cells into your body, which has a systemic effect on inflammation. They're immunomodulatory. So meaning, cause a lot of people think they're like, why would you put stem cells intravenously? Cause they think, you know, you're trying to repair tissue and regrow tissue, but stems, the first generation of stem cells, especially more than anything are signaling molecules, meaning they are going to help to reboot or reprogram your immune system, which is called immunomodulation. And that's why it's been shown to help with inflammatory bowel disease, rheumatoid arthritis, lupus, all these different conditions that are autoimmune based. Because it's rebooting the immune system. Because your immune system is kind of becoming haywire. So it's like, how do you get it back to a state where it's not sending the wrong signals anymore.

**SHAWN STEVENSON:** Thank you so much for tuning in to this episode today. I hope that you got a lot of value out of this. Again, this is about adding resources to your superhero utility belt. Batman isn't going to be the only one out here. With different things, different surprises that he's got to address any of the obstacles that he might face. We all have that capacity, but it comes from education. It comes from what are we paying attention to. And as Dr. Ellen Langer shared, it's really important to stand guard at the door of your mind and make sure that your mindset is in a place of healing that your mindset is such that you're organizing yourself and organizing your life in a way that you cultivate a graceful healing and just remember that at the end of the day you have so much power so much agency to influence your health and your health outcomes.

So make sure that you stay tapped into Resources and education things that keep you uplifted and if this was uplifting for you today You know I ask you to please share this

love with somebody that you care about. If somebody's been dealing with an injury or you just want to give this as a resource if you know somebody that's interested in health and wellness and recovery Share this with somebody that you care about, you know Sharing truly is caring and getting this information out to more people is more important than ever because there are solutions And so again, I appreciate you so much and please share this out on social media Share it with your friends and family.

We've got much more in store. You've got some epic masterclasses and world class guests coming your way very soon. So make sure to stay tuned, take care, have an amazing day. And I'll talk with you soon. And for more after the show, make sure to head over to [themodelhealthshow.com](http://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. 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, empowering, great content to help you transform your life. Thanks for tuning in.