

THE MODEL HEALTH SHOW

EPISODE 636

How To Reverse Multiple Sclerosis & Defend Your Body Against Autoimmune Diseases

With Guest Dr. Terry Wahls

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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. Currently, 25 to 50 million Americans have autoimmune conditions. This number has skyrocketed in recent years. And what a lot of folks don't realize is that upwards of 75 to even 80% of folks who are experiencing autoimmune conditions are women. So, there's something truly complex going on here. We have autoimmune conditions that were once rare, now reaching epidemic proportions.

And when deconstructing autoimmunity, which is what we're going to do today, we're going to look at somebody who's recovered from one of the most pervasive autoimmune conditions, which is MS or multiple sclerosis. And this physician, her story is going to blow you away. And she's going to give you some real powerful insights. Again, whether or not autoimmunity has affected you or someone that you know, it's growing so much. The trend is still going up, and this is essential information because it's very likely going to impact somebody that you love. And we can do something about this. We're not going to be in a situation where we're just going to be disempowered. This education is essential, and I wanted to bring on one of the best people in this field and also to be able to hear some tangible, viable tools that we can all implement to improve our resilience, to help to prevent autoimmunity, and also, of course, be able to have some tools to reverse these conditions. So, I'm really, really excited about this.

Today you're going to learn about the key ingredients that actually go into creating autoimmunity, and some of these ingredients actually lean into other chronic diseases as well that have become rampant in our society, one of those being Alzheimer's. A lot of folks don't realize that Alzheimer's has crept its way near the top five causes of death here in the United States. And this is another epidemic, and it has many autoimmune paralleling components to it. But something remarkable that's taking place in the field of Alzheimer's is the realization of the role that sugar plays in the development of Alzheimer's. And this is because Alzheimer's is also being notarized today by experts as, quote, type 3 diabetes. There's an insulin resistance developing in the human brain. The human brain is absolutely ravenous for glucose once it's consumed. Your brain can actually consume upwards of 50% of the glucose from any given meal that you consume. This is through evolution. The human brain was always just reaching out any type of glucose to run processes. It's going to reach out and try to grab it.

The human brain is only about 2% of our body's mass, but it consumes upwards of 25% of the calories we consume. Specifically, again, it's really going to be geared towards scooping up available glucose. Now this is all fine and dandy, but let's not eat candy. We didn't evolve with this kind of exposure to sugar like we have today. Since the brain is quickly confiscating sugar,

this is based on our evolution, hundreds of thousands of years having minute amounts of sugar exposure in our diet. Naturally occurring sugars, mind you, and not sugar in its kind of isolated, extracted form where this exposure can very quickly create insulin resistance in the brain. And this is the problem is that this is a normal response by the brain to downshift its insulin sensitivity to protect itself under abnormal conditions, under that abnormal exposure to so much sugar.

Now when this manifests, obviously it's a very, very difficult condition. There isn't a lot of peer-reviewed data on being able to halt Alzheimer's or even reverse it. However, researchers at Yale University published data reporting that MCTs, medium chain triglycerides, can readily cross the blood-brain barrier and be utilized by our brain cells, offering up an alternative fuel source to insulin resistant brain cells that are no longer metabolizing glucose efficiently and leaning into Alzheimer's disease. So, a remarkable study that was published in the Annals of the New York Academy of Sciences sought to find out if MCTs could have an impact on improving the condition of patients with Alzheimer's disease. The scientists discovered that since MCTs are quickly metabolized by the liver, prompting the production of ketones, those ketones are then able to easily cross the blood-brain barrier and provide an alternative fuel source for, again, those glucose impaired brain cells of Alzheimer's patients.

And here's what they found. The researchers found that consumption of MCTs, medium chain triglycerides, directly led to improved cognitive function for people with mild to moderate forms of Alzheimer's disease and cognitive impairment. There are solutions there. There are solutions available. But again, it's where is the education going? Because if we're looking at folks experiencing the standard of care, which is what we're going to talk about today, all you're going to see is a continuous decline. But there's so much more that's available for us if we get access to the right information and education.

By the way, I have MCTs just about every day. Whether I'm making a coffee for my wife and I, or a tea, or a hot cocoa for my son, I'm utilizing MCT oil from Onnit. Onnit is sourcing things correctly. They have a great extraction processing where they're not using these crazy high temperatures and they're not utilizing lower quality sources of MCTs. And in addition to their MCT oil, they also have emulsified MCT oils that kind of taste and function like coffee creamers. They're easy to mix into coffees and teas and smoothies and things like that. And this is something that we can have access to right there in our cabinet.

Go to onnit.com/model. That's O-N-N-I-T.com/model. Get 10% off all of their MCT oils. And also, they have some of the best high performance human supplements in the world by far. And they run clinical trials. This is what's different about Onnit as well. They'll put their money where their mouth is funding clinical studies at universities to demonstrate the efficacy of their products. And it's earth grown nutrients. They're not utilizing just isolated compounds

here or there. They're actually using food sources. So, if we take their pre-workout supplement, for example, Shroom TECH, again, proven to have efficacy through placebo controlled clinical trials, they're utilizing an extract or a concentration of Cordyceps medicinal mushroom for their formula. So, it's not just some isolated synthetic, keyword synthetic compound. Whole food concentrates, peer reviewed data, clinical trial affirmed efficacy. Again, head over to onnit.com/model. That's O-N-N-I-T.com/model for 10% off. Now let's get to the Apple podcast review of the week.

ITUNES REVIEW: Another five-star review titled “How I Found My Passion” by Orla B. “The Model Health Show found me back in 2020 when the world flipped upside down. I started with episode one and I'm still playing catch up. I was so inspired and captured by Shawn's charisma and the information presented in the podcast that I'm now studying to become a holistic nutritionist and have undoubtedly found my purpose. Huge thank you to Shawn and his team.”

SHAWN STEVENSON: Amazing. Thank you so much for sharing that and we need you in the field. Welcome. Thank you so much for sharing your heart and your passion and your voice. It really does mean a lot. And if you've yet to do so, please pop over to Apple podcast and leave a review for the Model Health Show. On that note, let's get to our special guest and topic of the day. Our guest today is Dr. Terry Wahls and she's a Clinical Professor of Medicine at the University of Iowa where she conducts clinical trials in the setting of multiple sclerosis. In 2018, she was awarded the Institute for Functional Medicine's Linus Pauling Award for her contributions in research, clinical care, and patient advocacy. She's also the author of the bestselling book, *The Wahls Protocol: A Radical New Way to Treat All Chronic Autoimmune Conditions Using Paleo Principles*. Let's jump into this conversation with the one and only Dr. Terry Wahls. Dr. Terry Wahls, it's so good to see you. Thank you so much for coming to hang out with us.

DR. TERRY WAHLS: Thank you for having me.

SHAWN STEVENSON: It's my pleasure. So, can you first start off by talking about what multiple sclerosis actually is and of course your personal experience with it?

DR. TERRY WAHLS: So, our current understanding is that multiple sclerosis is a neuroinflammatory and a neurodegenerative disease. For the longest time, we focused entirely on the neuroinflammation with the observation that the immune cells appear to be attacking the myelin and causing these acute episodes of worsening and then gradually improve. But MS is also a progressive disorder and there's a slow accumulation of disability, a slow accumulation of fatigue, of cognitive decline, and brain volume loss. So now there's more recognition that at the same time as these episodes of inflammation, which happened early,

at the same time from the very beginning, there's also neurodegeneration and brain volume loss that is occurring as well.

SHAWN STEVENSON: Holy moly. So, it's a multi-pronged thing. So obviously that speaks to the vast array of pretty bad side effects.

DR. TERRY WAHLS: It's the vast array of really bad side effects. And these acute lesions can occur anywhere in the spinal cord, cranial nerves, and in the brain. So, the symptoms can be a wide variety of things from sensory problems to motor problems, to balance problems, and people often have symptoms for five to 10 years prior to finally making an overt diagnosis.

SHAWN STEVENSON: Amazing. Amazing. And here's the thing, and why I'm so grateful to have you, is that rates of obviously autoimmunity overall have just been skyrocketing in recent years. One of the studies I just looked at, it's somewhere in the ballpark about 50 million Americans now have an autoimmune condition, and things were once rare, and multiple sclerosis has been rising as well. And you have a deep, intimate connection with this. So please, if you could, share your story.

DR. TERRY WAHLS: So, it begins in medical school. I'm 22. I begin to have episodes of discomfort at my temple. It's bothersome for a couple of days. Then it's not a problem. Comes back. It's more likely to trouble me if I'm sleep deprived, severely stressed. Over the next several years, it becomes a little more electrical. And when it's electrical, it feels like there's a jolt of electricity across my face. Nothing takes care of the pain. I just figure I have to endure it. Over the next 10 years, this becomes more troublesome, more severe. I finish medical school. I finish residency. I start my first year of clinical practice, which, by the way, is a very stressful time. I have a romantic relationship of five years, fall apart, very upsetting. And then I have an episode of dim vision in my left eye. And I see a neurologist. I see the eye doctors. I get MRI. I get an eye exam, retinal exam. No clear explanation. And they just tell me that I have autonomic dysfunction of the retinal blood flow. And to not work out in hot weather, don't race quite so hard. Because I do figure out if I'm racing, I can't see as well. My face pains continue to be more troublesome. I don't have any more episodes of dim vision. But I'm not racing anymore.

Then I have my son. That goes really quite well. I decide that I want to have another one. So, I have my daughter. And then about six years after I have my daughter, my face pain's getting more frequent, more severe, more difficult. But now I get some weakness in my left leg. And while I'm out walking, my left leg begins to really not work well. Dragging it to hobble home. See the neurologist who says, "Terry, this could be bad, or really, really bad. And he's going to start doing the work up." While I'm going through the workup, I'm like, "Okay, what does really, really bad look like?" And I'm thinking of the about 24 years of worsening electrical face pain that I've had. And I'm like, "Okay, this is going to be a progressive illness, whatever it is. And I

don't want to be disabled." So actually, I'm rooting for a rapidly fatal diagnosis. I don't want to be disabled. Three weeks later, I hear multiple sclerosis. My neurologist is very upbeat. There's drugs to take. I go see and do some research, find the best MS center in the country, see their best person, take the newest drugs.

I'm a little bit worse. Two years later, my neurologist mentions the work of Loren Cordain. I read his books on the paleo diet. And after having been a vegetarian for 20 years, I was a low-fat vegetarian, I go back to eating meat. The next year, I need a short reclining wheelchair. I take my dantrolene, a form of chemotherapy, to try and slow my decline. It does not help. They then tell me to take TYSABRI, which is the new biologic drug, very potent. It's very effective at turning off the immune system. It does not help. And I continue to decline. I switch to a new drug, CellCept. And now I decide, you know what, I think I need to be a little more active here because the best people are not slowing my decline. So ultimately, I begin reading the basic science.

At first, I'm looking for drug studies. Then I figure out, yeah, I'm not going to be able to access these drugs. I should look for supplement studies. And I start looking at other forms of neurodegeneration because it's my theory that neurodegeneration is my problem, not inflammation. I've only had two relapses in my entire journey of my problem. And that it's mitochondria that aren't generating enough energy, and that's driving the disability for Parkinson's, for Alzheimer's, for cognitive decline, and I think for MS. Now mind you, at that time, no one is yet talking about mitochondria for MS. But I'm convinced that that is the problem. And so, I gradually develop a series of supplements that I'm going to take for my mitochondria. And six months into this, I decide, yeah, it's really not doing anything for me. I'm still just as exhausted. And so, I quit them. And the first 24 hours is okay, but after 36 hours, I really can't function. I can't get out of bed. I can't go to work.

Three days into it, my wife Jackie comes in and says, you know, honey, why don't you take your supplements again? So, I take them. And the next morning, I can get up and go to work. Now mind you, I'm still fatigued. I'm still severely exhausted, but I'm back to my usual level of fatigue. So, I think that's very interesting. I tell Jackie that I want to try this again in two weeks. And so, we do the same thing. I stop everything. And again, at 36 hours, I can't get out of bed. I'm really exhausted. I wait 72 hours and I start my supplements again. And then the next morning I can go to work. So now I am very, very excited. Like okay, I'm figuring some stuff out that my neurologist and my primary care doc are not telling me.

So, after that, I really work at trying to find some time to read more of these basic science articles. And mind you, I'm not a neurologist. I'm not a PhD person. So, this is, you know, hard work for me. And I gradually add a few more supplements. I discover a study using electrical stimulation of muscles. I ask my physical therapist, could I try that? And he says he uses it for

athletes. He could grow bigger muscles. He's not sure my brain could talk to those bigger muscles. But he agrees to let me have a test session. It hurts bad, really bad. But when it's over, I feel great. This is the best my mood has felt in years. So, Dave says this is probably from the endorphins. We now also know it's also probably from the nerve growth factors that get stimulated when you do electrical stimulation of your muscles. So, we add the ESTIM.

I also discovered the Institute for Functional Medicine. And they have a course on neuroprotection, which I sign up for and I take. And they talk about mitochondria, so I'm really quite thrilled. And they're talking about this in the context of Parkinson's, cognitive decline, and Alzheimer's. And there's a longer list of supplements. So now I'm up to 18. Like, okay, that's good. It's all about my mitochondria. And then, you know, Shawn, this is a little embarrassing. It took me this long to come to this. Because I'd already been doing the paleo diet for five years. I'm like, you know, maybe instead of just focusing on what to avoid, I should focus on what to eat. And I should figure out where these 18 nutrients are in the food supply. So again, that's more research. And I have this new way of eating these lists of foods that I'm going to be stressing. And I start that on December 26. And you know, by the end of January, my mental clarity is better. My...

And I should set the stage for everyone. On December 26, I'm so weak, I cannot sit up in a regular chair like this. I have to have a zero-gravity chair with my knees higher than my nose, so gravity holds me in place. I have, you know, profound fatigue. I'm beginning to have brain fog. My trigeminal neuralgia is more consistently turning on. It's difficult to turn off. And so, you know, I'm very clear that I'm headed towards becoming bedridden, demented, probably living with, once it turns on, a breeze will trigger my pain, light triggers the pain, speaking triggers the pain, chewing, swallowing triggers the pain. So, I've rewritten my durable medical power of attorney such that if I stop talking and stop swallowing, there'll be no IV fluids, no tube feeds. So, I'm coming to terms with bedridden, demented, probably dying with intractable pain, you know, at that time, dying eventually of dehydration. That's what I'm looking at in the fall of 2007. Not that it's going to happen immediately, but that's the one way I see ahead.

So, I start this new way of eating. And by the end of January, it's like, you know, my mental clarity is definitely improving. My energy is definitely improving. And my physical therapist says, "You know, Terry, you're getting stronger." And he advances my exercise. In the end of February, for the first time in four years, I decided I'm going to mail a letter at the VA hospital. And I take my walking stick and I walk down the hall to the mail slot, and I mail my letter and people are like, "Oh my God, Dr. Wahls, you are walking." And then, you know, I begin walking around the hospital with my walking sticks and then with one walking stick and then with no walking sticks. And then that spring, so, you know, about six months into this, I, you know, I tell Jackie, "I'd like to try riding my bike." And you know, we used to be very big bike riders. It'd been probably six years since I'd ridden a bike.

And we have this emergency family meeting because, you know, my kids are afraid they don't want me to fall and get hurt. But Jack tells my son who's 16 at the time, six foot five, he used to run on the left. My 13-year-old daughter, Zeb, will run on the right and she'll follow. So, we all get into position. She gives it all clear. I get on my bike and, you know, it wobbles for just a moment, but I catch my balance. I bike around the block. That big 16-year-old boy, he's crying. My 13-year-old daughter, she's crying. Jackie's crying. I'm crying. You know, and I cry talking about that still because it was at that moment, Shawn, that I understood that our current understanding of secondary progressive multiple sclerosis is incomplete. And who knew how much recovery might be possible. So that's Mother's Day 2008.

SHAWN STEVENSON: Oh wow!

DR. TERRY WAHLS: I keep biking a little bit more, a little bit more. Jackie suggests that she signed me up for the Courage Ride in October, 18.5 miles. And I have to have a couple of rests along the way. But once again, as I cross that finish line, my kids are crying, Jackie's crying, I'm crying. And now my understanding of disease and health are fundamentally changed. It changes how I practice medicine and it will ultimately change the type of research that I do. And now it's my mission to teach other people with autoimmune and other chronic health problems that, you know what, there's a whole lot you can do.

SHAWN STEVENSON: Amazing. You're a miracle, you know, just sitting here. Well, again, this is a label that we use when we talk about something that we can't explain, but we can explain this.

DR. TERRY WAHLS: We can explain this.

SHAWN STEVENSON: You know, and there are of course, our lives itself are a miracle, but you sitting here today and even what you've accomplished today, you know, just you're on a little mini tour and you're giving so much. And of course, you know, you need to refuel, you need to take care of yourself, but you wouldn't even be here if you were on that same track that you were on previously.

DR. TERRY WAHLS: Absolutely. I would not be here. You know, I would have had the face pain turn permanently on. I would have... And when it turns on for the intensity of the pain, I have broken bones, I've had surgery, a c-section under local by the way, that was pretty intense, and I've had active labor. You know, pain. The trigeminal neuralgia is like 10,000 volts of electricity right here, like a lightning bolt, is way more intense than a broken bone, way more intense than post-op pain, way more intense than active labor. And so, if that had turned on, and in the end stage of progressive MS when trigeminal neuralgia turns on, it turns permanently on. And

that's when people with trigeminal neuralgia related to MS ask their physicians for assisted suicide because the pain is, all of your sensory input is transmuted to these horrific levels of electrical pain.

SHAWN STEVENSON: And you said that you believe it was your children who saved your life.

DR. TERRY WAHLS: Oh, absolutely. So as my health declined, and it's clear that things are not going well, I still have very young kids. You know, they were five and eight when I was diagnosed. I'm in the wheelchair when they're eight and 11. And I know they're going to face, you know, bad things happen to us all the time. Things never always go correctly. And you have to be able to weather those challenges. Now my kids are going to watch what I do every day. And they could watch that I give in to the despair I feel. And I certainly had plenty of despair that I felt. Or they could see that every day I'm going to do my workout. I'm going to do my little swim in the pool. I'll do my little water exercise. I'll do... My workouts kept getting smaller and smaller and smaller, mind you. But every day I did my workout. Every day I was going to work doing the best that I could. And I talked about that. Life is challenging, but you always do the best you can. And so, my little mantra in my head was, "Your kids are watching. Your kids are watching."

SHAWN STEVENSON: You know, obviously, MS is in this umbrella. You know, we talked about a little bit earlier, you know, there's just components of inflammation and also neurodegeneration. And there's obviously this autoimmune umbrella that is affecting so many people today. If you could, can you talk a little bit about how autoimmunity itself actually happens? What are the causative agents that can trigger autoimmunity?

DR. TERRY WAHLS: You know, I talked to my tribe that there are three steps. First step is do you have the genes that put you at risk. And easily half to two thirds of us have one or more genes that increase your risk a little bit. Then step two is did you have an infection with one of the microbes that germs and viruses that increase the risk for developing autoimmunity. And there are 16 that we've identified. It would be the very rare person that's not had at least one of those. And probably most of us have had several. Then there's step three. So, what is step three? Those are all of the other environmental factors, things that have to do such as early life stress, adverse childhood experiences, the quality of your diet, your microbiome, your social family connections, your loneliness, your spiritual life, your physical activity. The more of these factors that are in optimal health, the more resilience you'll have, the less likely you are to have a autoimmune process develop and an autoimmune diagnosis develop.

The more of these environmental factors that are not optimal but are pro-inflammatory, pro-disease causing, the more likely you are to develop those autoimmune processes and the more

likely you are to develop overly active innate immune system, the more likely you are to develop these autoantibodies and then begin damaging cells, tissues, organs.

SHAWN STEVENSON: Yeah. So, these are obviously you just listed off some epigenetic controllers, some epigenetic influences. Because you mentioned gene being one of the ingredients and you also mentioned that approximately two-thirds of us have these genes but not two-thirds of us have autoimmune conditions, so it has to meet these other criteria and the epigenetic influences is obviously a big one. You mentioned one of them being our social connections. I'm grateful there's so much more science coming out about this and how that affects the expression of our genes and our cellular health just by being around other people who bring us joy and having that sense of value and community. I want to talk about that too but first I want to ask you about, you mentioned diet. So how can our diet essentially act as an epigenetic trigger for autoimmunity?

DR. TERRY WAHLS: In medical school, so I learned a lot of biochemistry, a lot of physiology, a lot of pathophysiology. It's shocking that we learned very little about nutrition. So, we learned all these biochemical pathways, but we never really got the big message that the food that I'm eating today will be broken down into the fats, proteins, amino acids, carbs that I will then use to build my cells, tissues and organs and if I'm not eating all the building blocks, I can't make them. And so, the quality of my diet is going to determine the quality of my cells and will determine the quality of the biochemical reactions that I can have. And I'm either going to be struggling to do the chemistry of life and making incorrectly made molecules and leading to early deterioration. And if my cells are dying early in the constituent parts that should reside in the cell, spill outside, now they're very inflammatory. They really activate the immune system as a danger signal and that drives those autoimmune processes. The more you drive them, the more likely you are to develop autoantibodies, the more likely you are to develop the autoimmune processes and then, you know, and these sorts of percolate along for one to five years before you have the overt autoimmune diagnosis.

SHAWN STEVENSON: So obviously, you know, you just made that connection for us, which we don't make that when we're in... Even we're paying for these university educations and we're not getting educated that the food that we eat is going to be used to make the cells of your body, your heart, your brain, everything about you. And so, for you to regenerate essentially or provide the building blocks to sustain your brain and your nervous system that was kind of being broken down essentially, if we're not doing that, this is what happened when you started to find these particular nutrients and you had the 18 spreads that you were taking. And these were, I guess your experience was kind of slowing the process, right? And when you pulled that away, then you felt, you know, that the results of that.

But you also said that and I can so identify with this. So, when you said like, it's a little embarrassing to say this that we didn't make that connection. First thing I did when I was trying to get healthy and I found out about all these nutrients, I became a natural pill popper too. I think it's just a progress, you know, portion but then it got really expensive and also, it's just a logical thing like, wait a minute, where are these nutrients coming from? And also, there's something about food that needs to be brought into the equation as well. So why did the food form of these things seem to make a bigger impact?

DR. TERRY WAHLS: You know, it is huge. So, I have 18 different supplements that I'm taking, but food is way more complicated. You know, if I look at kale, it's more than just vitamin C or the B vitamins. It's all these carotenoids. There are, I don't know how many different thousands of molecules within that kale plant that my body is going to incorporate, that my microbiome will incorporate as they digest and make their metabolites that get into my bloodstream and that will support my biochemistry. Life is incredibly complicated. We have this very intricate set of biochemical reactions. I'm sure we haven't described them all and there's checks and balances. There's no way that I can identify what are all of the key substrates that we need. I can tell you we're doing, you know, in our basic science analysis of our data, we are also looking at the metabolites that we're measuring, I think about 1,500 different compounds and how they change from head enrollment to then over time. And that's still only a small fraction of the chemistry that's happening in our body.

The food we eat talks to our microbiome and the microbiome talks to our food that makes more metabolites that get into our bloodstream that then interact with how we run the chemistry of life. It's going to be, you know, I'm much more likely to be able to fill in all the gaps that aren't working correctly if I get it from the food as opposed to the 18 supplements. And that's when the magic happened. It wasn't when I was doing the paleo diet that may have slowed my decline, although it didn't seem to be much. The supplements certainly slowed my decline and I felt way worse without them. But the magic happened when I started focusing on, "Well, what do I need to be eating?" And by stressing my diet to maximize the intake of those 18 nutrients, I'm sure I got thousands of other really important nutrients. I had no idea, probably many of whom have not yet been named that were vital to making the chemistry of my life run more optimally.

SHAWN STEVENSON: So powerful.

DR. TERRY WAHLS: You know, in the first four years, I had this amazing craving for greens. I was probably having six cups of greens, a variety of greens every day. And I could tell if I didn't have my six cups of greens, my cognitive decline, yeah, it just was not as mentally clear. After the fourth year, I sort of got caught up. And then, you know, I didn't have to have that, quite that many greens.

SHAWN STEVENSON: This reminds me of research from Rush University. And they found that folks who were consuming just two or more cups of green leafy vegetables a day had brains that were functionally younger and also structurally younger by about 11 years than their peers who were having less than two cups a day. So, there's some, again, some really interesting inputs here. And you said something so important that I don't think that we often understand, especially if we've been in this field for a while. We still know so little. We still know so little about what's in food. We know a few, we knew... We know a few dozen things and that's awesome. But more discoveries are happening all the time. There's so much we don't know. And also, this might be the biggest thing right now that's left out of what's in food conversation, which is when you eat that food, you're eating that food's microbiome as well. Right. So, when I eat that blueberry, I'm eating the blueberries microbiome and that association, essentially, that's definitely lost when you're eating a bowl of Frosted Flakes.

DR. TERRY WAHLS: Oh, absolutely. Or if you're taking a resveratrol capsule. And I wanted to mention when at my nater, so I'm age 52, I completed a little online biological age questionnaire based on what I could do then, which was not much. My biological age by that calculator was 69. That's a little grim, but probably quite accurate because I couldn't sit up, I couldn't do a push up, I couldn't climb stairs. So that was probably really quite accurate. I was remarkably frail. So, I'm now 67, soon to be 68, and so I've redone that biological calculator. And so, I'm quite a bit older, but it says that my biological age now is 45.

SHAWN STEVENSON: Amazing. Yeah. Hell yeah. Terry, you're so awesome. That's amazing.

DR. TERRY WAHLS: You know, I had my telomeres checked with one of those telomere tests. I was bracing myself, Shawn, because okay, I've got progressive MS, I know that's a disease of accelerated aging. And so like, "Okay, you're going to get your age now, you'll not be freaked out when you see how old you are, and you'll just check it again in another year or so." I'm 12 years younger than my chronologic age based on my telomeres. And I think it's because I have this amazing diet, and I have reimagined every aspect of my self-care routine.

SHAWN STEVENSON: Amazing. Obviously, telomeres are one of the best biological markers that we have. And to see that essentially, we have the ability in many ways to kind of turn back the clock on our biological function, because you just gave the distinction between having our chronological age and our biological age. And this is seen in your performance, your functionality, your ability to... Because that's what we really want. It's not just to have a long life, but to be able to enjoy that life.

DR. TERRY WAHLS: To have a rich and full life. I want to be able to enjoy my family. I'm hoping that I may get to have grandchildren in my life. If not my grandchildren, there'll be other young

people in our lives. I want to be able to enjoy them. I want to have fun with those kids. And I want to still be teaching the medical students, the undergraduate students, the postdoctoral students. I want to be like Linus Pauling. I want to be giving lectures to full auditoriums with my insights and perspective when I'm 90, when I'm 100, when I'm 110, when I'm 120.

SHAWN STEVENSON: Yeah. Yeah. I could see this. This is so awesome. So now we talked about food being... From the nutritive perspective of food being a key building block of ourselves and functionality, let's talk about what happens when we have not so food products, right? You know, obviously, according to the BMJ, we've got about 60% of the average American's diet is now ultra-processed foods. So, you mentioned a key word earlier, you mentioned the microbiome. How can this interaction with certain foods that might even be deemed to be healthy for us can create degradation in our gut and that being a launching pattern on immunity?

DR. TERRY WAHLS: You know, I like to think of our ancestral mothers that we had, you know, millions of generations ago. There was a random mutation and one of the key enzymatic steps she could no longer do properly, but her microbiome could. And so, at that moment, her DNA got trimmed a little bit and her DNA was exported from her into her microbiome. So over again, millions of generations, we finally got the human DNA down to about 25,000 genes. But we have with a healthy microbiome, 5 to 9 million genes that fill in for all those gaps of the rich biochemistry we need to have a really thriving, healthy human. That evolution of the microbiome, you know, happened again over millions of generations as we were eating, you know, a very diverse set of plants. Of course, different plants depending on where you were in the world and different animal products. It was not based on eating ultra-processed food. So, when we decreased the diversity in our diet, we're starving out those microbiomes, those bacteria and viruses and parasites, all those critters that live in our bowels that were essential for our health and vitality are being starved, so they disappear.

And I can't do all the biochemistry quite right. Molecules don't get made quite correctly. And my health and my resilience deteriorate. The problem with the narrow range of food that we eat is that we are starving our microbiome. And the microbiome, we are super organisms. There's you and me and the trillions, at least hundreds of millions of microbes that live in our gut and on our skin that help us conduct the chemistry of life. And as we lose those partners, our vitality declines. So, I stress to my tribe that I want them to have diversity. I want them to have as high a quality of food that they can afford. But I also acknowledge that money is tight for many people. And in my clinical practice at the VA, the Veteran Affairs Hospital, where I was taking care of vets for decades, and I started using my diet and lifestyle program, I was taking care of people living on food stamps who were buying conventional food in their local small grocery store in rural Wisconsin, rural Iowa, rural Illinois. And they also had remarkable success. So yes, do the best you can with the financial means that you have. But you can have

some remarkable turnarounds, even if you're just getting your basic groceries in small rural Iowa.

SHAWN STEVENSON: Yeah, yeah. I mean, you know, of course, I come from that circumstance, you know, living in a quote food desert. And the most important thing, it's not accessibility to the things, it's accessibility to the education in a way that makes sense and that's empowering because we are very capable at figuring things out when presented with challenges. That's one of the great things about humans. It's just I didn't know that this mattered. And you just mentioned the number one thing we can do to improve the diversity of our microbes is to improve the diversity of inputs, improve the diversity of foods we're eating. It is then backed by science, number one thing we could do.

DR. TERRY WAHLS: You know, and I talked to, in my clinics at the VA, we would stress that this is a family intervention. So, I'd ask my vets to come with their spouse and, you know, sometimes they'd come with their kids, and we explained that, you know, the food you eat, it becomes the body you have. So, we need to learn how to eat good food. We would have little demo meals. I would have, I would pass around either kale, quite bitter, or dandelion greens, also quite bitter. And everyone would be like, "Oh my god, that is so bitter." And then we'd give them cooked greens with either a lot of ghee or if they were okay with eating pork, we'd make bacon and greens, and a little lemon juice or a little balsamic vinegar. And now this is delicious. Like, "Oh my gosh, that actually is quite tasty." Then we would make them a green smoothie. And even the kids would say, "Well, yeah, that's really pretty delicious." But it was transformative to show them first, it's bitter, it's terrible, yuck, of course I'm not going to eat that. And then we serve it up, cooked greens, it's delicious. We serve a green smoothie, it is delicious. And now they can believe that, okay, maybe I can do this.

SHAWN STEVENSON: Yeah, that's so awesome. So awesome. So, I want to ask you about, now we've talked about building block component of food, high quality real food. We talked about the microbiome association. And let's talk about the structural impact of the gut itself when we have foods that can kind of trigger the breakdown of the lining, that connection to autoimmunity as well.

DR. TERRY WAHLS: Yeah. So, the gut should have a barrier between what's being digested until it's properly digested down to the amino acids and the glucose. So, it can be absorbed into the bloodstream and then transported to do its work being built into you and me. If we develop some irritation of the gut because of alcohol, because of aspirin, because of having the wrong mix of bacteria and yeast, now we can get an opening and some of these channels open up. So, food proteins that are not fully digested leak into the bloodstream. And these incompletely digested proteins are recognized by the immune cells as, "You are too big to be food. You must be a threat." And so now the innate immune system will be active and will start making

molecules to kill the threat and what may have some collateral damage and you know harming myself. And over time, my adaptive immune system will begin to make antibodies against these food proteins. And that I'm sure is how I ended up with gluten sensitivity and sensitivity to the dairy proteins and sensitivity to the egg proteins, which I still have. So, I'm very, very careful to not have any dairy, gluten, or eggs because what I've learned is that will trigger my face pain.

SHAWN STEVENSON: Holy moly. Now this speaks to a couple of things. One of those being understanding your bio individuality and the triggers for you. And also, you know, just you said something earlier that I don't think people talk enough about or even just in you sharing your story, if people really get it. Prior to the severity of these symptoms, you had spent quite a bit of time on a vegetarian protocol.

DR. TERRY WAHLS: Twenty years.

SHAWN STEVENSON: Which is going to be very heavy in these particular foods that can cause...

DR. TERRY WAHLS: Very heavy in carbs, yeah.

SHAWN STEVENSON: This irritation. So, if you're talking about gluten, like you're just in that... One of the things we know, for example, with that gluten interaction is the activity of zonulin. So that trigger for pulling the gut lining apart essentially and it can create an excessive amount of that and you're doing that every day, day after day and you're trying to construct your complete proteins, this combination of this and that versus what your ancestors have done to kind of solidify health and wellness. And so, but you was doing the best that you could with the knowledge that you had. And of course, coming into it, same with me, it was very idealistic and also just very superficial as far as the science was concerned in taking on a protocol like that. So, number one, you can be bringing in a lot of inputs that are tearing apart your gut lining and also, you're likely going to be missing out on those building blocks that you talked about before for feeding the microbes and for building tissues.

DR. TERRY WAHLS: Yeah. And depending on the mix of microbes that you have in your gut and what you're eating, if you aren't feeding your microbes the things that they're looking for, they will begin eating up some of my own internal tissues so they can begin eating up the mucin and further put me at risk for having more leakiness of the gut and more of the incompletely digested food proteins getting into the bloodstream and also having some bacterial fragments get into the bloodstream, which activate the innate immune system and further exacerbate those autoimmune disease processes.

SHAWN STEVENSON: Yeah. This reminds me when I was doing my several years vegan vegetarian protocol and us having this big ass tofurky made of like tofu and like wheat balled up, like this whole thing. And of course, every diet framework is going to have value for different people, which is wonderful. This isn't a dictation because also with your protocol, you have a framework for folks who are vegetarian. And so, this is very important to make that distinction. However, the way that we go about it in our society, you've got to be very intentional and really be able to pay attention to your body and don't be dogmatic yourself because we tend to get, we'll trap ourselves in a box with our diet framework. You know?

DR. TERRY WAHLS: Yeah. I tell people that as soon as you hear some diet experts say, this is the diet, the only diet that works, the supreme diet, then stop listening to that practitioner. Humans, you know, we evolved from our primate ancestors eating a lot of greens, slowly started eating more animal products. They emerged as homo sapiens 250,000 years ago. We migrate into the temperate, the Arctic. We are in rainforests, grasslands, forests, the tundra. We eat a wide variety of things. We've had tremendous success with reproduction, eating a wide variety of things. And we know that we have very healthful societies eating a wide variety of things. We also know that there is one particular society that is, you know, wrecking their health and that's eating the ultra-processed foods with lots of added sugar, processed foods with a steadily more narrow range of foods.

SHAWN STEVENSON: Of course. So, this leads me to this important point, which obviously, you know, your personal story being multiple sclerosis, but you've also shared, and I remember seeing this in your book as well, that autoimmunity is essentially, it's essentially the same thing. There are many different expressions of it, however, right? So, autoimmunity, the components or the triggers for it are basically the same thing, but it's just portrayed differently.

DR. TERRY WAHLS: Yeah. You know, and part of that is your genetics, part of that is your microbiome, part of it is which infections triggered everything. And then you have this molecular mimicry process where I begin having a response to those microbes. But because the microbes learn to hide from my immune cells by having an amino acid sequence, it looks like some part of me. And when my immune cells finally figured out, no, no, no, you're not really Terry, you are the Lyme infection. So, we're going to attack you. And they can now take out the Lyme infection, but because the Lyme had a similar amino acid sequence to some part of me, whether it's my skin, my lungs, my brain, my thyroid, that will experience some collateral damage. Again, still, most people get through that phase and don't develop autoimmunity, even though that molecular mimicry is going on, that we're able to recognize it and get it stopped and extinguished before serious damage occurs. So, step three is all those epigenetic factors that we mentioned earlier. Do you have fans that are... Do you have a lot of dysfunctions with your microbiome, your diet, your lifestyle, your sleep, et cetera, that are causing this to be a huge problem for you?

SHAWN STEVENSON: Yeah. Wow. This is so important. As I mentioned, the rates of autoimmunity have just skyrocketed, but you don't have to have a diagnosed autoimmune condition to be experiencing some of the side effects of this molecular mimicry.

DR. TERRY WAHLS: Yeah. Coronavirus, we've all been through this huge pandemic, and we all had to experience the severe stress. Many of us were lonely and isolated. We had financial stressors as a result of the pandemic. And we also know the coronavirus, including SARS-CoV-2, is one of those microbes that increase the risk of autoimmunity. So, I predict that we will likely see an increase in the rates of autoimmunity. And there are certainly a number of clinicians, myself included, that when we look at the high numbers of people who have persisting symptoms after COVID that last more than 60 days, these are excess inflammation, excess oxidative stress, and look very much like these are autoimmune processes. And is this part of protocol of a autoimmune diagnosis that will then be fully nascent, fully formed in one to two to three years for that person?

SHAWN STEVENSON: Yeah. Thank you for bringing this up. This is the long tail effects that we don't think about in the short term. And also, this speaks to, when you go back to those components, those ingredients in the manifestation of autoimmune condition, genetics, viral, some kind of infection, and then the epigenetic influences, which of these are under our control is the third one. This is speaking to even more importance right now for us to get our citizens healthier and more resilient. Just getting in a state to where their bodies are able to, like you said, just make appropriate decisions, create appropriate compounds. And this is leaning to the conversation about our mitochondria. Because our mitochondria play such a huge role in, also just specifically even in your case and your body being able to recover. Can you talk about how our mitochondria plays into this whole equation?

DR. TERRY WAHLS: All of our cells depend on our mitochondria. Our mitochondria generate the adenosine triphosphate, the ATP. There are cells we use to drive the chemistry of life that needs to happen to make everything that we need to make, to live, to reproduce. And the parts of our body that have to do the most work, which is our brain, our retina, and our heart, have the most mitochondria per cell. If we can't make enough ATP, the function of that cell begins to falter. And the outputs for that cell begin to falter. Okay, so in the brain what happens? We have fatigue. We have irritability. We have brain fog. We may have more anxiety. We may have more social anxiety. We may have a lower mood. We may have more depression. We'll have difficulty with memory, with recall. And those were the most common symptoms in the primary care clinic. Those were the most common symptoms in the traumatic brain injury clinic. Those were the most common symptoms in our therapeutic lifestyle clinic. And likewise, if we aren't making enough ATP, we begin having difficulty with vision. And we can begin to have difficulty with our cardiac function, shortness of breath, decreased exercise tolerance.

SHAWN STEVENSON: This is bananas. So, at its core, so we know that our mitochondria are playing this critical role in our expression of our health, just everything about us. Now the problem essentially is that our mitochondria can, I'm trying to find the best word to say this but can be starved.

DR. TERRY WAHLS: They often are. They are for several reasons. First, we're poisoning them. So, we can poison them because we've got heavy metals in our water, in our air. We have heavy metals in our personal care products. We have hormone disruptors, solvents, pesticides, herbicides in our indoor environment because we've made much tighter living spaces and there's more synthetic solvents, glues, et cetera. So that can disrupt the efficiency of the mitochondria. Then we have these terrible diets. And so, our poor mitochondria are missing out on the vitamins, minerals, cofactors needed to properly run the Krebs cycle. And so, they're struggling to generate all of the ATP. And as the cell struggles and the mitochondria struggle, the mitochondria begin to get skinny, get smaller. They decrease in number and the function of the cell declines. And this is why if you have a neurologic or psychiatric disease, I think it's really vital to work on tuning up your mitochondria. If you have a retinal disease, macular degeneration, a leading cause of blindness in the United States, the supplements for macular degeneration are mitochondrial supplements. These should go quite a bit broader than they are, but they're basically mitochondrial supplements. And a lot of the supplements for cardiac issues and heart failure are mitochondrial supplements as well.

SHAWN STEVENSON: This is so simple. So, our mitochondria are making the currency of life, right? Now, if we're not providing the environment for them, the nutrient substrates, because this is what's so interesting. We have this final currency in a sense or finalized currency that the mitochondria are making for us, but we have to give them something to exchange. It's kind of like an exchange station if you go out of town exchanging currency. And so, we need these building blocks. Now you mentioned us losing mitochondria, losing functionality with them, but we can also make you healthy, robust mitochondria. One of the things I learned from you was how important magnesium is in that equation.

DR. TERRY WAHLS: Magnesium is super helpful. Zinc, also super helpful. In the zinc and magnesium are cofactors for the B vitamins that facilitate a lot of the steps on the Krebs cycle pathways. You know, that can add in some creatine, carnitine, co-enzyme Q. Very, very helpful. But again, for all the listeners, I want to remind everyone, those supplements, they were great. I felt way worse without them. The magic did not happen until I redesigned my diet, my paleo diet, which has a lot of great things about it. I love the paleo diet, but that wasn't enough to fix me. My supplements was not enough to fix me. I had to combine everything I learned to stress what I needed to eat.

SHAWN STEVENSON: There are particular foods that have been utilized for thousands of years that are a virtual fountain of many of these nutrients. Can you talk about what some of those foods are?

DR. TERRY WAHLS: Yeah. Yeah. So, we'll talk about things to add first, because I stress that to my family. Go out and add these vegetables first. Green leafy vegetables, a rich source of a bunch of carotenoids, lutein, Zeaxanthin, meso-Zeaxanthin. They'll have a bunch of the B vitamins in them, although not B12, and great sources of calcium, magnesium, and vitamin K, which your bacteria will metabolize to K2 and K7, and your liver will further metabolize to K2 and K4. Then we're looking at the sulfur-rich vegetables in the cabbage family, onion family, mushroom family. And again, sulfur is a very important nutrient for detox. It's a very important nutrient for neurotransmitters. It's a very important nutrient for the glutathione, which is a master antioxidant for our cells.

And then the third category was deeply colored vegetables, various things like blue, purple, black, orange, yellow, green. I want to have all of the colors. Notably, we're shortest in the blue, purple, black category. And we know the more color you eat, the lower the risk of diabetes, lower the risk of heart disease, the lower the risk of cognitive decline. There's a lot to love about what I just said there. So, you ramp up those vegetables. I'm telling my folks the goal is three plates of vegetables and berries, measured raw. And they're like, "Oh my god, did you mean per week or month?" I said, "No, no, no, that's per day." So, we're adding that. We're also talking about high quality protein. And again, if you're a vegetarian, it's gluten free grain and legumes. If you're a meat eater, it's two palm sized sections of meat. And then I encourage fermented foods, sauerkraut, kimchi, marvelously good for you. Nutritional yeast, also marvelously good for you. And seaweed a couple times a month.

Then the things to remove. Reduce and if you can, eliminate added sugars, processed foods, white flours. And I tell everyone that if you have an autoimmune problem or a neurologic or psychiatric problem, you may well have unrecognized gluten sensitivity and casein sensitivity. So, take those foods completely out 100 percent. Ninety percent won't do it because you're still getting the foods occasionally. You're still causing your immune system to react. And then the third group that I take out is I take out eggs. Eggs, particularly yolks, are super foods. They're really, really great for you unless you have an abnormal immune response. And eggs are the third most common food sensitivity, at least here in North America. And for me, they cause, you know, I have a severe response and I have my face pain turn on if I have eggs. And so, I ask everyone to take those three foods out. After one to three months, you can retry the eggs. You might tolerate them. And if you do, by all means, enjoy them because they really are a super food.

SHAWN STEVENSON: Yeah. All right. Awesome. Awesome. Now within that, so we've got some daily recommendations. We've got some general recommendations on what to avoid as well from some of the most likely culprits. But what about, I know that you mentioned the nutrient density for you was organ meats.

DR. TERRY WAHLS: Yeah. Yeah. Well, now that's a more advanced level, but it's certainly one I recommend people go down. The organ meats, oysters, mussels, clams, tongue, tongue's really quite delicious, heart are also quite delicious and very easy to have. Liver is a little more and kidney are a stronger taste that may be an acquired taste, but prepared properly, they are so, so delicious and they are a great source of the vitamins, great source of pre-made retinol, which is the vitamin A, a really good source of co-enzyme Q, good source of carnitine, creatine, lipoic acid. So, I certainly encourage organ meats every week. I encourage liver once a week or oysters, clams, mussels once a week. Fabulously good for you.

SHAWN STEVENSON: Awesome. Awesome. And by the way, you mentioned vitamin A, this is critical. This is one of those nutrients associated with longevity, but there's a difference between, as you mentioned, that form that you're going to be getting from something like liver versus what you'll find in plants.

DR. TERRY WAHLS: Correct. So, plants have carotenoids, think of beta-carotene, which is orange, but any of the deeply pigmented colors will have some carotenoid in them. Your body will have to use their enzymes in your small intestine to metabolize that to retinol, which is the fully formed vitamin A. Now, retinol is really important for immune health, important for proper cell division. So, very, very... Because we need healthy immune cells to function well. However, like many of our nutrition, particularly if you're taking it in pill form, I want everyone to keep in mind, if you have too little, you have a disease state. If you have too much, you might also have a disease state. There's a U-shaped curve and there's a broad U for some nutrients and a narrow U for other nutrients. Retinol has a narrow U. If you have too little, you're going to be sick. If you have too much, you're going to be sick.

SHAWN STEVENSON: It's like that with so many things. We tend to find something that we believe does something for us and then we'll just go ham on it, balls to the wall on this thing.

DR. TERRY WAHLS: Yeah. Water, we all know we need water, right? Water is essential for life. If you don't have enough water, you're going to die of dehydration. What people may not realize is you can drink too much water, polydipsia, and you can create water intoxication. I remember as a resident, every year we'd have several patients come in with psychogenic polydipsia drinking too much water and they stroke out and have a terrible outcome because they became water intoxicated. Many, many of our nutrients have this U-shaped curve. Now sometimes it's a narrow curve, sometimes it's a very broad curve.

SHAWN STEVENSON: Just to be clear too, I'm so glad that you brought this up. For the most part, for most Americans, it's the lack.

DR. TERRY WAHLS: Yeah. It's the lack. It's the lack. So, we all need some retinol. I think having some liver is absolutely good for you. Clarified butter or ghee will also have retinol, it's absolutely good for you. Some of my carnivore friends who think all plants are poisons and they don't want to have any plant material, they want to have only animal products. There are some of those folks who advocate a pound of liver every day. That will eventually become a problem. If your retinol stores are very, very high, that can lead to fibrosis in the lungs, fibrosis of the liver, fibrosis of the heart. Then you've got all this retinol stored in your fat, you can't get rid of it. So now you're talking like a heart, lung, liver transplant. And even that will not last very long because you have all this retinol stored in your fat.

SHAWN STEVENSON: This just makes a lot of sense. Our ancestors weren't just doing that much liver. You know, again, it was not...

DR. TERRY WAHLS: They were doing some, yeah.

SHAWN STEVENSON: Yeah, absolutely. And of course, the folks who were deemed to be of importance within the tribe, of course, they're going to get preferential slice of the liver, heart, brain, those kind of things. But for folks, they're just like, I want those benefits, but I might not necessarily be attracted to organs right now. For me, it's not what I started off with, and I know you as well. I was getting kind of isolated synthetic versions of nutrients versus concentrates of certain whole foods. So, there's a great like grass-fed organ complex that I'm a fan of, and it's from Paleo Valley. And they have... Do you use that too?

DR. TERRY WAHLS: Yeah.

SHAWN STEVENSON: Yes. See, it's grass-fed beef, grass-fed heart, grass-fed kidney. By the way, with heart, we're talking about a great source of CoQ10 as well. And what they do, what's so remarkable about them is number one, the sourcing. Number two, how they actually process it, which it's cold temperature processed, freeze dried, highest level of quality integrity. So definitely check them out, paleovalley.com/model. That's P-A-L-E-O-V-A-L-L-E-Y.com/model, 15% off everything they carry. And I just saw literally just a few moments ago, they just added wild caught fish roe.

DR. TERRY WAHLS: Oh, that'll be marvelous.

SHAWN STEVENSON: Yeah, so it's a brand new-this is a world premiere announcement right here. And I was talking with Dr. Lisa Mosconi, she's a neuroscientist out of NYU. And for her, she's just like-neuroscientist but also, she's a nutritionist and it's a unique blend so she's looking at when we eat certain foods and nutrients, actually seeing what shows up on scans, like are we actually making a difference in the brain? She said that salmon roe, so fish eggs, are one of the most remarkable foods for our brain and nervous system.

DR. TERRY WAHLS: Yeah, yeah, I would think so. That is like a superfood. Absolutely. I'll be checking that out.

SHAWN STEVENSON: Yeah, so again, that's paleovalley.com/model, 15% off. We love them. Dr. Terry Wahls, if she puts a stamp of approval, that means a lot.

SHAWN STEVENSON: Yep, stamp of approval. Absolutely.

SHAWN STEVENSON: All right, so I got to ask you about this as well. So, we talked about mitochondrial dysfunction and we talked about inflammation, but I want to talk just a little bit more about stress and one of the components of epigenetic-healthy, positive epigenetic expression. One of the biggest stressors is lack of connection, lack of community. And you mentioned this earlier, as you were rattling off these epigenetic influences on our health, and I don't... I want to circle back to it because I don't want to look past... There's a tremendous amount of science coming out about this, but again, this is just one of the logical things. It's an input that our DNA expects from us.

DR. TERRY WAHLS: Absolutely. We evolved in small clans, and we had to rely on one another. We had to figure out how to get along with each other. You couldn't have this civil war in a small clan that relied on each other for protection and for the hunt and the gathering. Then we have discovered that we thrive with the small intimate connections. We could maybe have meaningful connections to up to 100 folks, but it's probably 2 to 15 is the more optimal number. There's the very rare person who actually is pretty happy as a solitary person. Usually, they want to have at least one other, so that is far more common. If you put someone in solitary confinement, it is a huge accelerant to aging. It is a huge accelerant to all disease processes. Think about the last two years of the COVID-19 pandemic. How lonely people were, how lonely our children were, how lonely our elders were, how lonely many of us were. It was helpful that we had Zoom. There's something about seeing other faces and being able to read the cues around the mouth particularly that appears to be very important to our social understanding. If you can't do it via Zoom, then call and talk. If you can't do that, at least write. But if you are lonely, that is more disease promoting than being sedentary. It is more disease promoting than smoking.

SHAWN STEVENSON: It's powerful, very, very powerful. We need each other.

DR. TERRY WAHLS: We need each other.

SHAWN STEVENSON: I want to ask you about this from your book. You said, "Don't give your diagnosis more power than it deserves. It's just a name given to a set of symptoms that you have." Can you talk about that?

DR. TERRY WAHLS: Our health depends on our chemistry. People can sometimes reach out to me. They want to have a name for their diagnosis, that they're working so hard to get a diagnosis for why they're feeling bad. I try to discourage them from working so hard on their diagnosis. Instead, I want them to work hard on creating health and vitality, to work hard on addressing all these epigenetic factors that are under their control. They can let their conventional primary care doc; conventional specialist treat their disease. If they have it, that's fine. Work with me, get my book, work on improving your health one tiny next step at a time. I want to remind everyone that I'm still working on my health. I'm still working on reflecting on my habits, what I'm doing. Things will ebb and flow. How much time I spend meditating versus how much time I'm in the sauna versus am I spending more time on strength training or aerobic training? Am I paying more attention to my sleep or not? What you're focused on is going to ebb and flow in your life. But always take time to think about, "Okay, how am I doing on my self-care routine? And where should I be focusing right now?"

SHAWN STEVENSON: Our health is a process. It's not a destination you arrive at. You are just such a remarkable human being because you decided and ultimately, just even hearing the story when you were thinking about your children and what you can do even from a wheelchair to demonstrate resilience and that things happen in life, this is not a straight line. Things are going to happen, but each day taking action and showing up. And you have showed up in such a huge way for so many people, huge inspiration for me personally and the lives of so many people that I admire. You are a hero for them as well. Having you here is such a special thing. You're an example of what's possible. It's just so cool and so amazing. Could you let everybody know where they can get more information, connect with you, and of course get your book?

DR. TERRY WAHLS: A couple more things before we do that. I want to talk about the next clinical trial that I'm doing because one of the things that is so important to me is to create the standard of care. That diet really matters for the MS patients. So, we've been doing clinical trials. We're now on to our eighth clinical trial. We'll be comparing a ketogenic diet, a modified paleo diet, which is basically the Wahls Elimination Diet to usual diet. It is for people with relapsing remitting MS age 18 to 70. You'll come to Iowa. We'll get baseline assessments, which will include an MRI. No contrast. It's going to be a research MRI so we can understand your brain volume. Do you have any active lesions or not? We'll get measures of walking, thinking,

hand function, and vision. Measures of mood and quality of life. We'll randomize you to either the ketogenic diet, the modified paleo diet, or you continue on your usual diet. You'll come back in three months. We'll repeat blood tests. Then you'll come back in two years at 24 months. We'll repeat all of the measures including the MRI.

Now the primary outcome is do we improve quality of life at six months? The secondary outcomes, we'll look at all of those measures. The secondary outcome that I'm most excited about, Shawn, is that we're going to be measuring brain volume change. As I mentioned earlier, if you have relapsing or progressive MS, your brain is shrinking at three times the rate of healthy aging, like 0.7 to 1% or more each year, which is why we have so much fatigue and we're at such risk for cognitive decline. One of the things that I'll be measuring is, can I, by improving your diet, get you back to the healthy rates of aging? Which diet is going to be better? Is it the keto diet or the paleo diet? I really don't know. I also know that people who do diet studies aren't like the public. They want to improve their diet. When I go through the consent, we have to describe the keto diet. We describe the paleo diet and that, yes, you can follow your usual diet. The people in control are, they want to change their diet. I know full well they're going to try to implement one of those two diets because they know they got a terrible disease, and we can't blame them for that.

We're going to give them tips every month, recipes, cooking videos to reduce their sugar, increase their vegetables, improve the quality of their diet. So, if they do, they will improve their diet. And in fact, I expect all three groups will improve. I still think it's possible the intervention group may improve significantly more than the control group, but I don't know that. It's possible that all three groups will be relatively equivalent. And if they are, but I am able to show that we improve their brain volume loss so they are losing brain volume at the rate of healthy aging, this will be landmark. This will be phenomenal. This will have huge public health consequences because the DMTs do not prevent brain volume loss. They don't prevent cognitive decline. They slow it a little bit, but people still end up in wheelchairs. They still end up with profound fatigue. They still end up with cognitive decline.

SHAWN STEVENSON: Terry, I've got to ask you a question here. This seems so obvious and important. Why has this not been done?

DR. TERRY WAHLS: Well, you know, I've been writing grants to the NIH since our first study came out in 2014. So far, the NIH gives me pretty scathing reviews, but I've been seeing patients since 2017. My grateful patients, some of them come back to say, "We'd like to support your work," which is why I've been able to do so many little, small pilot studies. And they have graciously funded this big study, which will be the largest, longest study in the setting of multiple sclerosis that will have been done to date. And when I get back home on Thursday, I'll be having the conversation with that donor, giving her an update on our recruiting status and

how things are going. And it couldn't happen without Courtney and John. The university was like, they were so, they had mixed feelings about what I was doing. I was a little bit controversial, I'm sort of eccentric. And people weren't sure I should be doing this.

And then they got some cold calls with people, you know, whose work, whose lives I had touched, who made six figure donations to my lab to let us do some of those early studies. Then we got another call, just like that. And then I got an appointment in my calendar with the Dean of the College of Medicine. I thought, "Oh my goodness, what have I done now" And the Dean like, "Okay, Dr. Wahls, what's going on? Why are people cold calling the university to give you this kind of money? That has never happened to us." Then the university gave me some staff people to work with the foundation to help us develop these relationships, which have allowed us to fund some postdoc scholars to help me write more manuscripts, which is why I have 24 manuscripts out now, and to write more grants. Not that the NIH wants to fund us yet, but they will eventually. And to write more protocols that let people like John, Courtney decide, "We believe in you. This is a really important question. We'd like to help get it answered."

SHAWN STEVENSON: Yeah. Again, you're talking about changing the standard of care here. It's a big picture thing. And you mentioned earlier, the NIH. So, to answer this question in summation, funding from government entities, it's changed so much, obviously in recent years where we see the majority of clinical trials now funded by drug companies. It's just the nature of the beast. And I remember a time when it was frowned upon to get funding or for a drug company to be kind of intervening in prestigious university trials. But now it's just the nature of business. And as a matter of fact, if you're not meeting the parameters of what a drug company is wanting to achieve and you're coming in with something that seems so different, if we're talking about doing trials on nutrition, the complexity here. And so, what I'm trying to say is the audacity of you to do this and to get the funding and to put this together is so remarkable and so special.

DR. TERRY WAHLS: And part of the reason I'm able to do that is... So, I'm not a PhD, I'm not a neurologist. Had I been a PhD or neurologist, I would have known that you wouldn't do this kind of experiment. And I did it on myself and it worked. And my chair of medicine at the time, Paul Rothman, was a rheumatologist, understood autoimmune disease well. He was the one who said, "Get a case report." And then he was the one who said, "And I want you to do a clinical trial, safety feasibility study." And I said, "I don't know how to do that." "I will get you the mentors. This is important. You need to do that." And so, we got that first study going. And he encouraged me to keep doing these small pilot studies. He was so impressed that this money was coming in and I could do these small studies.

And to all the listeners, I want you to know that every person who has a new innovative idea always meets enormous resistance. And we all resist new ideas. Shawn, you do it, I do it. It takes

a while before we finally go, "Well, maybe there's something to that." So, in 2014, it was enormously difficult for me to get that paper published. It took me almost two years to find a journal that would take our paper. And then, you know, that actually was easier to get out, easier to get out, easier to get out. The study that we did, funded by the MS Society, we got funded. We got into the Multiple Sclerosis Journal, the Experimental Translational Clinical, a pretty high impact. Then my postdoc, Dr. Titcomb, did an analysis of all the diet intervention studies that have been done that looked at fatigue and quality of life. And he's written that up. He submitted it to Neurology, the highest impact neurology journal, and it got accepted. He's doing the page proofs right now. It's very exciting. We have made such huge progress in these 15 years, when the neurology community said diet has no place in MS care. And I can tell you that there's going to be a paper in Neurology and with an accompanying neurology that will talk about the role of diet in MS care. That's going to be very exciting.

SHAWN STEVENSON: Yes, absolutely. And again, you're such an important figure. We're going to be talking about you for a long, long time. And also, you're going to be here educating us for a long, long time. Very grateful for that. So again, can you let folks know where they can find information about participation in the study and where they can pick up your books?

DR. TERRY WAHLS: Okay. So, the book, The Wahls Protocol and the companion cookbook, Wahls Protocol Cooking for Life. You can get at your local bookstore. You can go to my website terrywahls.com. T-E-R-R-Y. Wahls, W-A-H-L-S dot com. You'll see links to the books there. Across the top, you'll see a link that will let you screen for this study. You could also Google Wahls Lab, U Iowa, and that will take you to my lab page and you could screen there. When you complete the screening, that will tell me that you're eligible. My team will reach out to you. We'll have to get permission to get your medical records so I can verify your MS diagnosis. And then we'll begin having the conversations with you about how to get you enrolled in the study. We will enroll 156 people in. We have about 50, 55 people in now. So, it means I'm looking for another 100 and I'll be recruiting for another year and a half. We would love for you to join us because for me to show this difference, I need 156 folks. We'd love to have you be part of that.

SHAWN STEVENSON: Wonderful. Wonderful. Again, thank you so much for being you and for being such a light in this world and for taking the time to put all this together in a succinct, like your book is wonderful. It's actually, I'd send people, I didn't tell you this, but like my son is working in fitness now and he has a client with MS. And so immediately I send your Ted talk, right?

DR. TERRY WAHLS: Oh perfect.

SHAWN STEVENSON: Give him this resource. So, you're creating these entities that we can pass along, and all people got to do is click play or open a book and they can have their life change, their story change because of you. So, it's very special and I appreciate you for that.

DR. TERRY WAHLS: Thank you, Shawn.

SHAWN STEVENSON: Dr. Terry Wahls, everybody. Thank you so much for tuning into the show today. I hope you got a lot of value out of this. This is one to share up with your friends and family like crazy. This story is so remarkable, and this is what's possible. Please share this out on social media. Of course, you could take a screenshot of this episode. Tag me. I'm @shawnmodel on Instagram and Twitter and I'm at The Model Health Show on Facebook. And of course, you could send this directly from the podcast app that you were listening on, and it'd be a great idea if you're listening to the audio version of this podcast, come over to YouTube, come and hang out with us in the studio and you can see the story directly from Terry herself. There's a energy about these episodes to be able to put a face to the voice and to be able to see the studies of course that we put when we're talking about peer reviewed data that we're referencing. Of course, we like to throw up the references. It's just really a great addition to be able to add in this visual multi-media experience. And so, I would love for you to come over to the YouTube channel, we're at The Model Health Show. Subscribe to YouTube because we've got exclusive content there as well.

I appreciate you so much tuning into the show today. We've got some epic shows coming your way very, very soon. So, make sure to stay tuned. Take care, have an amazing day. I'll talk with you soon.

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