# Learn How To Avoid MS Relapses Triggered By Anxiety Transcript

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## Introduction and expertise

Hey, Austin, it's great to see you again today. I'm so glad that you can be part of my summit, but I'd like to have you do is introduce yourself and explain why you're an expert in this area.

Great. Well, Dr. Wahls, it is a pleasure to be talking with you again. And what an important subject to be talking about inflammation, the immune system in the brain.

So my back story is that I'm an internal medicine doctor and board certified in internal medicine. But pretty much as soon as I got into medical training, I had the recognition that unless I was able to pay attention to something a little bit deeper, I was missing a huge part of the equation as it related to getting people healthy and keeping them healthy.

And that has taken several kind of different paths over the course of my medical training. But really, the the core part of it for the last eight years has been in the focus on and trying to better understand how our brains are being changed by our experiences in the modern world and how that leads to impact on our mental health and on our cognitive health.

So understanding how things like diet, our gut health, the stress that we experience modifies our risk for conditions like depression and dementia. And to that end, an area that I'm incredibly passionate about, where I have both published peer reviewed papers, lectured kind of extensively on this topic, and I'm actually doing ongoing research and education on is as it relates to the brain, what are the inputs that go into our brains that change how we feel and change how we think?

And specific within that is the question of how the immune system influences our brain function and an influence is our risk for depression. So, you know, I have a podcast ton of educational resources on this, but I did write a review paper published in 2021 in the journal Frontiers in Neurology that specifically looked at the interaction between the immune system and risk for depression.

## Depression prevalence and medical training

I think this is a huge and really under appreciated area that allows us to understand how things like our food and our interactions with other people in our environment is shaping our risk for mental health conditions.

And maybe more importantly, it helps us to create new understandings and new tools we can leverage for a field in which the standard of care is still very limited to either drugs or to psychotherapy, which isn't widely available.

So, yeah, you know, so we're talking to EMS and neuro immune and I know in multiple sclerosis anxiety and depression are huge and a big driver in increase morbidity loss of employment in a lot of suffering.

And that's probably true for all of the other neuro immune conditions where we have an autoimmune disease that has neurologic and psychiatric symptoms.

Could you talk a little bit about just how how prevalent this depression is in our society? Yeah, you know, every time I say these numbers, I get a bit of a feeling of sadness in that you would think that with all the breakthroughs in modern medicine and all the things that are supposed to let us feel better about our lives, that these numbers would be decreasing in the last decades.

But that's unfortunately not the case. So what we see is right now, there are over 300 million people around the world who are suffering from really clinical symptoms of depression, meaning if they went into a doctor's office, they would be diagnosed with clinical depression.

And so that doesn't include all the people who are suffering from depressive symptoms, who are feeling depressed, but who don't quite get to the threshold of saying you would be diagnosed with depression.

So a couple of other things I'll just say on that. The lifetime prevalence of experiencing major depression is probably around 10 to 20%. So this is a very common disease and it is something that affects women about twice as much as it affects men.

So I think that's another important thing to point out. The average age of onset for experiencing depression is in one's twenties, but it does kind of go across the lifespan.

And one of the really unfortunate statistics we're seeing right now is an uptick in depression in our younger population. So children and adolescents and this is a condition which we know increases risk for a wide variety of other conditions.

Basically everything that's cardio metabolic, in addition to just dying earlier. So it's not just a question about depression that we need to be paying attention to.

It's what does this represent as far as a unified risk factor for other conditions? And to the point you brought up, you know, we see a ton of overlap in inflammatory and immune conditions like M. S.

and risk for developing depression. You know, when I look at my own personal experience, I began having troubles, low mood as an adolescent and struggled with depression through undergraduate medical school residency.

Now, for which I was able to finish my undergraduate degree, my residency in practice, but there was certainly a lot of struggle and I fortunately began recognized early on.

That exercise was, for me, tremendously helpful. Can we stay on that for a second? Because I think what you brought up, you know, it sounds straightforward, but it's really anything but that.

And so we both went through medical training where we learned about diseases. What has been clear is that medical professionals experience depression at a rate that is significantly higher than the general population.

So something there seems off to me. Either we don't understand what is actually driving depression and therefore we just don't know why doctors are getting depressed or we do.

And it's something beyond just well, it's neurotransmitters that get altered because conventionally speaking. So this is at least true in the internal medicine sphere and I guess you can speak more to your patient based.

The way that we approach depression is do nothing until you experience such significant symptoms that there's something that we can do about it. And it's like thinking about diabetes or high blood pressure as far as we now know that pre-diabetes matters a lot.

We now know that pre hypertension matters a lot and anything we can do to slow the rate of conversion from pre-diabetes to full blown type two diabetes is a really important thing.

We don't do anything like that as it relates to mood disorders and especially depression. And so I'll say one other thing as it related to what you just described, which I can resonate with, which was, you know, I did not always have great mood when I was in my medical training, I saw a psychiatrist who said, you know, I can't sleep.

What do you recommend? You know, I think I'm stressed with work. I don't know what's going on. Was there any conversation about lifestyle modification, about exercise, about improving my quality of sleep with something else?

No, there wasn't. At the end of the day, it was if you'd like Ambien, I'm happy to prescribe that for you. And it's just, you know, this is par for the course.

Your med student, you're going to be stressed. Sleep is not going to be great. So I think there is a fundamental issue with the way that we have approached mood disorders in medical training, in that we care so little about preventive management that we don't even care really whether doctors get depressed, get anxious.

## Rethinking depression treatment

That is par for the course. So how would we possibly expect if we can't even look after ourselves, that we're capable of providing preventive management for patients?

It just it seems a little bit off. It's a whole lot off, really. Now, you and I have since learned that, in fact, there's a whole lot more we can do other than just Ambien and Prozac.

So. Well, why don't we talk a little bit more in our practice for people who have depression? And this would be true. Whether you're a depression is part of your M. S.

or neuro immune disorders. There are things that that we can we can do. What are you doing for your your patients? Boston I'd like to start first with, again, a really big misunderstanding, which is that depression is a serotonin deficiency.

So people may know a big paper came out just a few months ago that really called attention to the fact that there's not good evidence for that explaining depression, meaning that serotonin issues explain depression.

Why is that important? Well, if you look at the standard of care for depression management right now, it's antidepressants. And specifically SSRI is which are the most commonly prescribed antidepressant medication and SSRI, by virtue of its name, a selective serotonin reuptake inhibitor is supposed to work by increasing serotonin in the brain.

Now, we could talk about the relative efficacy of SSRI, but I think that's kind of beside the point because what we now know is that serotonin does not explain depression.

It may explain a subset of people with depression, but certainly not all. And, you know, to be honest, I feel like if you look at how humans experience life, this would be very clear if a person came into the clinic and they said, I'm feeling depressed and you find out that their partner just passed away versus a person who came in and said, you know, I've been on this experimental drug and I feel depressed.

We wouldn't expect it to be the same mechanism. Right? It's not like you're really stressed and therefore your serotonin plummets and now you're depressed versus somebody who takes a medication is now feeling something else and now is feeling depressed.

Or maybe the best example, the person who has an infection. Right? So I had a viral infection not too long ago, like many people. Was my mood at 100%. It was not.

But it's not just the serotonin, it's inflammation. It's other things going wrong. So the first point I just wanted to put forth is we have to get outside this model of one molecule explaining depression, which is serotonin.

Mm hmm. So once that is understood, I think for clinicians, it's important to understand that there are probably a number of subtypes of depression. So for some people, it may be accident or kind of stress pathways that lead to depressive symptoms.

For other people, it may be inflammation that's leading to depressive symptoms for other people. It may be as a consequence of something like a TBI for other people.

It may be in the consequence of a different disease like metabolic dysfunction and even insulin signaling. So all of this has to understand there are a number of kind of roads that get us to what we would call depression, but what isn't necessarily one specific condition.

So what can we do? I would argue from a preventive side, I think that's really important or really what could we do as an adjunct to conventional therapy?

So where there is increasingly good evidence is in a couple of things. First one I would mention is exercise. So results from the Hunt study as well as other research published in JAMA in the last few years indicates that there is likely a causal interaction between exercise and prevention of depression and that it may be efficacious in management of depression.

So that's a good thing to consider. Is that moving your body physical activity seems to have a positive effect on mood and may target depression mechanisms.

There we could talk about include anti-inflammatory, include increase in molecules like brain derived neurotrophic factor, but that would be one thing.

Another thing that I think is very important and certainly something I'm sure we'll get into is the role of diet in mood. And so what we have in the last several years are for the first time kind of randomized interventional trials, looking at dietary changes for people with depression.

Usually what we see is kind of just population based studies.

## Diet, ultra-processed foods, and mood

We say, well, people who eat these foods tend to feel better than people who eat other foods. But we have a couple of these interventional trials that have been published that show that when people are given a mediterranean pattern of diet, meaning one that avoids ultra processed foods, that eats more whole foods, so some plant based foods, some animal that.

For a moment you're saying ultra processed. Let's help people know what we mean by ultra processed. It's a great it's a great point. If you look at what most people are eating today, it is a reflection of the food that they purchase out in restaurants and the food that they purchase in grocery stores.

Right. That's where we get our food. There is a huge difference between getting a hot dog from your local fast food restaurant versus getting a piece of chicken from your grocery store or a piece of work or a piece of beef that you have basically prepared for yourself.

Why is that the case? Well, the hot dog that you're getting from the fast food restaurant has been processed in a number of different ways, meaning it has had things added to it, it has had things taken away from it.

And so the quality of that piece of meat is very different from the quality of the meat that you would buy in the grocery store. Similarly, if you're talking about eating a sweet potato that is very different from eating a potato chip in which many nutrients have been stripped away and things have been added to make it more palatable.

The way that I generally approach this is ultra processed foods are things in which key nutrients have been removed and often additives. So things like sugar as well as other things that increase powerful mouthfeel our present.

Consider this the majority of foods that you will find in a grocery store have added sugar. That means the majority of foods you'll find in the grocery store have been processed, meaning things have been added to it that in essence decrease its nutritional value but increase its palatability.

So you can define ultra processed in a number of different ways. I would say the more steps between a food that you could find out in the wild, meaning you could point to a cow, you could point to a chicken, you could point to a carrot, you could point to some kale.

But it's much harder to say that potato chip was anything like what was growing out there in that field. That's how

you start to look at ultra processed food.

How much have humans messed with this food before I've consumed it? And generally speaking, that means anything you find in the core of a grocery store.

So if you find it on the periphery, in the butcher shop, if you find it in the produce not processed, if it has a single ingredient, broccoli, not processed, if it's broccoli chips in which sugar has been added, some corn sirup has been added, some additional oils have been added.

That is a processed. Food ever simpler. If there's a barcode, it's a processed food. Like that too. You know, it's really quite different having brown rice and black beans.

You know, it's plant based that's very different. It's whole food. It's very different from a black bean cracker. Pasta, bread that has been processed will raise my blood sugar much more rapidly and is more likely to have compounds that some food scientist has added to cause me to overconsume that end product.

It's such a good point and I'll just say, you know, everyone has a different perspective on the right diet to eat for health. And to some extent that even changes as it relates to brain health.

You know, you know very well there are those who say you have to eat all plants and those who say you have to eat all animal products. And one of the most consistent through lines that I have seen is that it's not so clear is saying plants or animals.

It's more clear to say is it a processed version of that? And so actually a recent paper just came out and it looked at meat consumption, a very controversial topic, and it looked at health outcomes.

And what it concluded is it's processed meats that are the issue. It's not meats in general that are associated with so many of these negative health outcomes.

So I'm going to make one point of clarification here. If you grind up the meat to make sausage and you're not adding stuff to it, I don't call that processed meat if right.

If you processed and add stuff to it to make hotdogs. Well, that's definitely processed meat. The way I look at it is if I'm doing the processing, I'm not worried about it.

So if I'm adding the ingredients at home, I'm not worried about it. And it's just kind of concentric circles of influence. So if my friend is making the hotdog and I can vouch for them, then still I don't look at that as a processed food.

If the butcher down the block that I know well, it's maybe a little bit less concerning. But by the time you get to the drive through restaurant where the hotdog has been made by somebody in another state, maybe even another country, and has been messed with so much that it'd be hard to even identify the main source of protein in that piece of food that is an ultra processed piece of food.

So I'm totally in agreement with you. Processing can get confusing and people have pushed back when I say this and say, well, you know, you grind up the beef that's processed food that's not what I'm talking about.

I'm talking about how much have other people messed with this by taking out key nutrients and adding in things that are bad for your health. And in molecules to convince us to overconsume.

And that's what what processing is all about is creating things that are shelf stable and to convince you and me to over consume that product. Yeah, I mean it goes beyond that.

Even so, it's not just the overconsumption that is important. They want you to continue to eat it, but it's getting you hooked on certain types of products at an early age so that later on in life it's habitual preference for things that are bad for your health.

I mean, this is probably best represented as it relates to children food ads. What are we targeting? Children? It's not vegetables, it's not fruits, it's goals to get them hooked on unhealthy cereals, unhealthy beverages, so that later on it's not that they are driven to it because it actually tastes good.

They're driven to it because it's a ritual. And so that's a really concerning part of this equation, which is so much of this happens below the surface of our conscious awareness.

You raise a very interesting question. So a lot of my patients with and their immune have you know, I've talked to them about improving their diet, improving their self-care routine.

They have because there are so many women who have depression and their EMS and neuro immune, we're trying to convince them to improve their diet. How do we help them be more successful when they have these young children?

Okay. Well, there's kind of a couple of questions built in. One is, how do you actually eat healthier? I mean, it's one thing for people to say, eat less of this, eat more of this.

Does that translate into changes in diet? Often it doesn't. And the other piece is taking into account the realities of what it means to eat healthier for a situation in which not everybody is so motivated to do so.

You know, I think it's almost always the case that when you're living with somebody else, be that a partner, be that a parent, be that a child, that people will be on different pages as it relates to why they care about changing their diet.

I can't tell you how many times I had a patient come in and I was saying to them, you know, you really need to change what you're eating because you're having heart issues, because you're having blood sugar issues, because you're having mood issues and maybe they would be on board, but their spouse would not care.

And so it turns out the spouse was the person purchasing the food. So these are very real things. So to answer kind of both of these, I guess in series, the first thing I would say is making major changes to any aspect of lifestyle tends not to be what actually sticks.

So at one point I would tell people, start exercising, start sleeping better, start meditating, start eating healthier. And often none of those things worked versus trying to make things habitual, trying to make things practical.

So sometimes I find the best way forward is to find one aspect of diet that can be positively influenced, that's going to have an outsized reward.

## Helping families change eating habits

So the biggest bang for your buck and the one that I often focused on was sugar sweetened beverages because as it turns out, the top source of added sugar in American's diet is sugary beverages. So we're talking energy drinks, we're talking sodas, we're talking coffee drinks.

This is one of the most pernicious ways in which sugar sneaks into our diet. This is a great scenario in which people can often have autonomy over their own decisions.

So unlike saying, Well, we want you to prepare a beautiful feast that incorporates real whole foods for the whole family every night that they may hate, that the kids may push back against sugar sweetened beverages are very much within an individual's control.

So I think that is an amazing place for most people to start because the other aspect of this is so often it would be only when the first person started to see positive improvement in their health as a result of their changes that the spouse or somebody else would say, Oh, you know what else?

What is it that they're doing? And sometimes it's the friends too, who would say, Oh, well, they started making the changes. What did they do? Right. I see. They lost weight. I see they're feeling better.

Yeah. Yeah. So that works that works well, I think for adults and for individuals. For kids it's tough. I am not going to claim that I have the perfect solutions.

I think modeling behavior is key. So I think that, you know, if you're telling your kids you have to eat veggies every day, but then you're going out and not sticking to that plan.

Kids are smart. They're going to see through that. But I think the other thing is trying to make it more enjoyable is always key. And so I don't think there is a scenario in which, you know, for a little while, but I was a kid, my mom and my dad had tried some interesting things as it related to my food choices, and I definitely didn't stick to that.

So not trying to be completely extreme around that seems to make sense to me and trying to be a little bit more gradual. The other thing is coupling it with other rewards can be helpful.

I think making it as painless as possible is helpful. But the bottom line that I feel to all of this is you've got to find ways to maintain a sense of balance, and going towards an extreme diet of any sort doesn't work for ourselves, and it certainly doesn't work for our extended families.

So I've seen families try to do all sorts of things as it relates to getting kids healthy. I think find the little wins and don't expect for things to go from 0 to 100% overnight is really important.

And again here I would say sugar sweetened beverages may be an important place to start and maybe just outlawing those in your house as a first line of making benefit and not necessarily worrying about every little thing over the course of the day until you've nailed that one would make sense.

I love that. I think that's a great place to start. Now why don't we talk a little bit about neuroplasticity? I know that there's some evidence that people with depression were at greater risk for more rapid brain volume loss, higher risk for cognitive decline.

And so there's a lot of conversation about neuroplasticity. City Is there anything that we can do and would that help with depression? Yeah, there's absolutely something we can do.

So as background, the idea of neuroplasticity is very simple. It just means that your brain is always changing as a reflection of what happens in your environment, and usually the conversation is something along the lines of, well, you don't have enough neuroplasticity thought problem, so you want more neuroplasticity, but what I caution there is to say your brain can change for the better or for the worse, and both of those are neuroplasticity.

The empowering notion here is that you can always change your brain. The scary notion is that other people, the modern environment can always change your brain.

If you set your brain on autopilot in the modern day and allow neuroplasticity to do its thing, you will wire your brain for poor health in poor mental health, that is the default state.

So that's important to understand. Could you explain that? So so there's no scenario in which our inaction inhibits neuroplasticity.

## Neuroplasticity and social media

What I mean by this is by virtue of what you do, where you focus your attention, the interactions you have with other people, the food that you eat, the news that you consume your brain is always changing.

If you know something today that you didn't know yesterday, how is that possible? It's because your brain has changed. So brain change is always happening.

Neuroplasticity is always happening. It's up to us to decide what direction do we want that to go. So think that's really important. Do you want to be the director of your brain change or do you want to outsource that to your environment, to the surroundings?

And in the modern day, if you do that, if you outsource it, chances are you're going to have a bad time. So that's the first point to make. So everyone who's listening well, I want you to think about is how much time you spend looking down at your phone with your neck posture down.

We're getting these neck nodules and this tech posture that is driving her neck forward. A very bad for her spine, increasing the risk for neck pain. And I certainly see evidence as I look at the literature that the more time spent on social media, the more things, more anxious are children are, the more anxious we are as adults and the more depressed our kids are.

And the more depressed we are as adults. Anything you want to add to that? Yeah, well, I do want to just touch on the second part of your question, which was what about neuroplasticity and depression?

And the point I wanted to make there was what has been shown is that there are issues with neuroplasticity seen in depression. So one part of it may be that neuroplasticity is impaired, meaning it has your brain has a harder time changing in a positive way.

Or it could mean that because of neuroplasticity, your brain has gotten wired in a way that is not so helpful to your mental health, so that both of those have kind of been seen.

And there's different ways to image this. So you can look at a person's brain with depression and you can see kind of shrinkage or atrophy. That's thought to be a reflection of changes with neuroplasticity and that your brain, not necessarily the number of neurons, but the number of connections they have, has decreased.

That's proposed to be one of the ways in which neuroplasticity happens. And well, let's talk about social media, then. I'll talk about maybe some things we know about what to do about this.

I'm coming back to this idea, this fundamental idea that your brain is a reflection of where you focus your attention. We ask the question, Where are we focusing our attention?

If you live in the United States, you are spending upward of 11 hours a day on average, if you're an adult engaging with media, of which about 4 hours a day spent watching TV, two plus hours a day is spent on your phone, and then a ton of time spent on computers and other devices listening to the radio.

If social media was just neutral, if watching TV was just neutral, meaning had no positive effect on our brain function, had no negative effect on our brain function, the opportunity cost meaning what?

You're missing out on by spending your time on your phone would still be enough that I think most people could recommend. It was bad for our health, and I want to say that again, even if it did absolutely nothing bad to us, we are missing out on the stuff that is good for our health, good for our brain.

By virtue of spending 11 hours of our day interacting with digital media. Unfortunately, we do see signals that, especially in certain populations, the best example would be adolescent girls that spending this time on social media, on digital devices is linked to worse mental health and unhealthy use of social media, which I think we've all experienced.

Probably some version of this we know we can feel inside when we're getting stressed, when we're getting anxious is linked to worse mental health. So that is a thing.

And coming back to the neuroplasticity issue is social media, is our digital exposure rewiring our brains? Absolutely. If you think about this, our time spent doing anything is rewiring our brains.

So certainly 11 hours a day is significant enough to change our brain wiring. So what can we do about this? I think there's two major things to think about.

The first is shift your attention. It's as simple as that. If you want to wire your brain in a better or different way, you have to give it different inputs.

So you need to not spend 11 hours of your day consuming unhealthy media if your goal is to wire your brain for the better, you could shift your news consumption, so it's a little bit less stressful.

That might be enough. You could just take a pause on social media for a few days and instead actually do something that is positively linked to brain health.

Calling a friend or family member, having a meaningful conversation, preparing a meal, engaging in mindfulness. And then the second thing I would say is how can you positively upregulate neuroplasticity in a way that is healthy for your brain, may help combat depression, may help combat dementia?

The best evidence that I've seen and I'd be interested to hear your take on this as well, is through exercise. And the reason for that is we have a ton of different lines of evidence.

So one is when people exercise and you image parts of their brain like the hippocampus, which is involved with our memory and is key to Alzheimer's, you can actually see an increase in brain structure, an increase in that brain, in that region, in people who exercise versus those who do not.

You can also see a dramatic and reproducible increase in levels of a protein called brain drive. Neurotrophic factor, which is probably the single strongest up regulator of neuroplasticity that we know.

That happens immediately after exercise. If you measure a person's levels of this molecule, they spike immediately after they exercise. And this is reproduced many times.

So moving your body is probably the most powerful way to upregulate neuroblastoma study and changing your attention is probably one of the most powerful ways to make sure that the direction of that neuroplasticity goes in a way that is good for your brain, good for your mental health, and good for your risk of developing brain issues.

You know, I could not agree more movement is key. I want people moving in. I think about how do we sustain it? So it's enjoyable, you know, exercise, very difficult.

Doing things together, going for walks with your family, with your spouse, doing sports, playful activities that's easier to sustain. Wearing a wearable device that lets you know your act, your minutes in mild activity, low activity, moderate activity, high intensity can be very helpful.

## Exercise, inflammation, and brain health

And then looking at that over time, you know, when I started doing electrical stimulation of muscles, when I was profoundly disabled, the thing that I found that was so striking was the effect on my mood and my physical therapist said, it's the endorphins.

And we later now realized it was the PDF that was going getting fired in my brain because I was getting more exercise equivalent to then when I'm able to exercise more, it's absolutely key to the body enough to feel good.

The mood know I'm sure the cognitive improvements that come with that regular exercise. Yeah well so there's I think another piece of this puzzle that we're learning about in medicine right now, which is what does exercise due to the immune system?

And coming back to the initial topic of inflammation and depression, brain health exercise is a potent up regulator of inflammation, which people would say, I don't want inflammation.

What you see, if you measure a person's blood immediately after they exercise, is a massive spike. We're talking up to thousands of times higher in an inflammatory marker called interleukin six.

Why would we want that? Well, I think the most interesting part about exercise speaks to a topic called Heart Muses, which is a technical way of saying just good stressors.

Exercise is a stress on the body. We need good stress on the body. Exercise increases inflammation transiently, but the net result is a decrease in inflammation.

And there's some really interesting biochemistry around inflammation, meaning it's not as straightforward as saying, well, you have this marker, therefore it's inflammation because it turns out that interleukin six and it's just this will be a little bit of a nerdy dove for those who are interested.

Interleukin six, which has long been thought to be one of the most powerful regulators of inflammation as it relates to brain health can actually signal in a couple of different ways.

And the way that it signals after exercise may actually be an anti-inflammatory mechanism versus the type of inflammation we see with an unhealthy diet, with sedentary behavior, which is a pro-inflammatory mechanism.

So, you know, I went for a run the other day and I got back home and I felt awful. You know, I felt exhaust. I did. I felt like I had really, you know, torn up some muscles, not in a way that was going to lead to any sort of long term problems.

But I could tell I had done something in my body that, you know, it felt like I was dying a little bit. And then I realized that's kind of what we're doing here, is we're giving our bodies a little bit of stress in order to live longer, in order to feel better, in order to enjoy life more.

And I am in no way recommending that people go out and do that, because I don't think that's something reproducible. I think many people get on this exercise kick and say, I'm going to run a5k every day, and they do one or two and they say, I hate this and they stop exercising.

So I really moved towards not talking about exercise, but instead talking about movement because movement just moving your body, literally getting up, doing some stretches.

I think that speaks to the way that our brains are wired far more than the expectation that a person exercises for 30 minutes, five days a week come rain or shine.

So to that end, I really think where I am is 100% exercise is fundamental to health. Brain health, depression prevention, dementia prevention. But instead of looking at this as some sort of a discrete, you know, you need this many minutes, this many days a week start from the habit science start from an understanding of how do you program your brain to make these things more likely.

And the way that you do that is you make them enjoyable, you make them simple and you make them reproducible. So I would far rather somebody put on their shoes and leave their house five days of the week.

Whatever happens next, I don't even care. But if you keep doing that, you're building a habit versus have them run ten miles one day and then stop. The goal here is reproducibility and the way you get that is making it enjoyable and making it easy.

So find ways to make movement part of your day and you brought up some good ones. You know, sports going for a walk with a friend, doing an online Pilates class.

That is not the important thing as to what specifically it is even, though. There might be some science showing that, for example, high intensity interval training is better than yoga in the aggregate, the goal is area under the curve.

How many times can you get yourself off your chair and move? Your body is far more important than the intensity of a couple of times that you do that.

So it's kind of me going on my current exercise rants, but I have moved away from the recommendation I was making for so many years. Which was your goal?

30 minutes, five days a week? It doesn't mean that that isn't true. It doesn't mean that it isn't helpful, but it does mean that may not be the most useful way of conveying it to everyone that I talk to.

## Where to learn more

That the goal is to get the benefits of exercise in a way that lasts you for a lifetime. And often that means finding more creative solutions that may not be and highest intensity.

If everyone is listening, I think we're talking or suggestions move a little more, preferably every day. That's it. But you know, get up and move now.

This has been really fabulous. Awesome. Can you tell us more about that? People want to learn more about you on your website and if they wanted to come see you or work with you.

Yeah, I appreciate that. Well, right now I am 100% doing research as opposed to saying patients. So I'm not taking new patients. But as far as how they can reach me.

So you should reach out. As far as following me, go to my website. austinperlmutter.com. If you're interested in brain science, I try to make it accessible as possible, so it's a lot of, you know, the three best foods, the three top tips in order to make it something that I think is super important, which is relatable and readily implemented for all this complicated science.

So my website, austinperlmutter.com is where you can find my newsletter and it's the easiest way to stay a hold of me. I do have social media. Dr. Austin Perlmutter, if you want more bite sized content.

Well, thank you again. Austin. This was wonderful. And I look forward to seeing you the next time we're in town together. Sounds great. Thank you, Terry.