Supercharge Your Recovery With Electrical Stimulation Transcript

(Transcripts are generated by AI and may contain errors)

Introduction and Background

Welcome, Garrett. I'm so excited that you agreed to be part of the M. S. and Neuroimmune Summit. Now I am thrilled to have you, but I'd like to have you do is introduce yourself and explain why you have this magical expertize.

Well, thank you so much, Dr. Walz. It's great to great to be here and get to catch up with you and be involved in this amazing, amazing project. My background is is really engineering and neuroscience.

And so I feel very blessed to have found a way to overlap and intertwine these, you know, these areas that I where I have a lot of formal training with my passion for the human body.

And I started down this path initially as an athlete looking for ways to recover faster. And, you know, it's so interesting that so much of that work is is really focused on the hardware of the body, the tendons, the ligaments, the muscles, the tissues, bones, etc..

And the big breakthrough for me came when I recognized the neurological component even to, you know, more physical injury of learning that it wasn't as much about the the injury itself or the original insult, but the response to that injury, the response to that trauma, and that is neurological in nature.

And by by working on that, we were, you know, started off working with more people like myself, athletes, helping them recover faster. But but we saw the power of this neurological approach.

And very naturally, over time, we started applying it with people who have neurological injuries, like, you know, spinal cord injuries and neurodegenerative diseases like arms and the various others that we're talking about on this series of talks here.

So let's talk about one of my favorite topics, neuroplasticity. Many of us who have multiple sclerosis discover that you can stop the relapses with drugs very effectively now.

But there's still this slow deterioration that continues. And what what role does neuroplasticity have in our ability to recover from that slow deterioration that that really begins to occur often around the age 40?

Neuroplasticity and Recovery

First of all, I think it's important for us to understand what neuroplasticity is, and that is the capacity that we all have to adapt and change to what we experience in the world, to our environment, to the various inputs.

So, you know, an example of that is a child who grows up here in the United States might hear English or Spanish and naturally learn to understand that language and speak with that sort of dialect and accent.

Whereas a child who grows up in China is going to to learn Mandarin and understand those tones and inflections and that language. So that's an example of adapting to the signals from the environment, right?

The language that they're they're constantly hearing. So we all adapt to that, certainly more in childhood. But one of the biggest breakthroughs in neuroscience in the last few decades is understanding that we maintain some of that ability to adapt even in later years.

So even for people in their 40 or 5060s and seventies, there's still opportunities to change. We you know, for a while it was thought that that whatever neurons we have, you know, that's it in the brain and in the body that, you know, things were hardwired and they couldn't change after a certain period of time.

And we're learning more and more of that that, you know, it's not necessarily as much change as can happen, you know, in children, but there is a capacity for people to change even in those even in those later years.

And that opens up this possibility for, you know, my patients, patients with other autoimmune conditions where they have these degenerative changes opens up an opportunity for them to harness the power of neuroplasticity to help restore that function that's been lost.

And that, of course, comes with the caveat that you have to first do all of the other wonderful interventions that you teach about. And the other speakers in this series are talking about, you have to first do what you can to stop the progression of the disease and quell that autoimmune situation.

And then from there, you can talk about working to restore the function that's been lost and trying to get back to baseline. So neuroplasticity is the capacity to change and it's it's neutral.

We can change in a positive direction. We can change in a negative direction. And so part of that, that ongoing progressive deterioration that you're talking about is neuroplasticity.

But it's neuroplasticity in the negative direction because there's there's two main parts there that I think we really have to consider. There's there's user use it or lose it is a is a big one.

You know, our brains are oriented towards survival and protection. Our brains want us to do less and not more because our brains want to conserve energy in case there's a famine.

Our brains want to not have us create too much for us or move too fast or or stretch too far because we could get injured. And of course, the more primitive parts of our brain have, you know, that they're really, you know, focusing on survival.

They want to limit us so that we don't get injured or we're not at risk of of getting eaten. Right. That that does. You know, in for those most of us in our neuro immune problems as we do less and less, we become more conditioned and that accelerates our disability.

And the reason I'm so thrilled that you are here is because your intellectual stimulation of muscles and that was a big part of my recovery. I had worked with a physical therapist who treated athletes and used electrical stimulation in his athletic practice to help them recover from injuries more quickly.

And I convinced him to try it on me and join us. Man, I really it was uncomfortable and I let him really zap me, but I felt great. My brain loved electricity.

So let's talk about that and talk about the newbie and why you think my brain so loved that electricity. Yeah. So this this is where we can now start to tap into the positive side of neuroplasticity instead of instead of things adapting and and getting worse.

How Electrical Stimulation Supports Healing

This is where, you know, we can can cause function to improve over time where neuroplasticity so so just for that to kind of set the foundation here if we're talking about neuroplasticity helping people in a positive direction, you know, we obviously have we have to look at the fundamental level, look at the mechanism so as if the immune system, if there's autoimmune condition, has caused degeneration within nervous system tissue, whether it be myelin, of course, in the case of mouse or other other parts of nerves or connections between them, we have to either stimulate the body to repair the tissue that has been damaged or cause a functional reorganize zation where the body may use a detour or a new pathway to accomplish the same goal.

So typically, if there's damage in the brain, it's easier to find detours. If we're talking about nerves in the body, it's it's typically more about rebuilding the, you know, repairing the damage that that the body has experienced.

So that's what we need to do if we're if we're wanting to restore function. And in order to in order to do that, there has to be enough input so that that the brain understands the brain gets the point, hey, we actually are going to use these pathways.

Hey, it actually is worth investing. The energy and resources to repair these and maintain them for the long term. Because if you just do something once your brain says it's not, you know, not worth it, it's not worth investing all those resources to up regulating, rebuilding, repairing and and maintaining that that neurological pathway.

So so you need enough trigger here to to do that. So so there's this underlying theme that we're going to have to, you know, we're talking to talking about M. S.

or patients or patients in similar circumstances. We're going to have to start thinking of ourselves as athletes, because it takes it takes a lot of work to flip the switch to where the brain essentially starts to starts to shift into the state in a state where it's going to invest these energy resources for long term building repair.

So so you have to basically you have to work hard. You have to treat yourself like an athlete. And to your point about, you know, your brain starts to feel good when you're getting enough of the right kinds of input, then we're starting to get these short term benefits of exercise on the brain, whether it be the releasing of endorphins or body and brain derived neurotrophic factor, which can help stimulate growth and stuff in there.

We're getting getting neurotransmitters. I mean, we're getting some epinephrine and dopamine and we're getting these wonderful things that help help the brain function better in the short term.

And then doing that once isn't enough. We have to then maintain that for the long term as well. And where electrical stimulation comes in is that, you know, there's this there's this amount of input that we need both within each session and then cumulatively over time.

And so that amount of work, it's like if you if you were driving from New York City to L. A., if you started, if you were if you were traveling from New York City to L. A.

So if you have you have this fixed distance that you have to go, you could you could walk it, you could ride horseback, you know, you could drive it or you could fly.

There's there's different ways to get there. But some are more time efficient and quicker than others and perhaps safer and then others takes take longer are less efficient.

And so using using technology like the newbie for different reasons that we can talk about is going to be among the most efficient, if not the most efficient way to achieve that input.

So you're going to be experiencing a lot of input within one session, which is part of why the brain like we know about these beneficial effects of exercise on the brain.

So you're going to be experiencing that, that increased cognitive function from all the, you know, boost of all these wonderful chemicals short term. And you're also going to be getting that because you're going to get the input.

You know, if you if you need to do thousands of reps of a movement within each session or each week in order to accumulate hundreds of thousands to drive these changes over time with with the input of something like something like the newbie device you can you can get so much input to where each movement, you know, when you when you do it, when you do a movement of your arm, for example, you say you send one signal like, okay, this happens.

The load on the tissues is one signal to the brain. Maybe with the Nubian, each movement is actually the equivalent of five signals to the brain because you're getting this barrage of input.

And so it starts to start to create that that input that's that accelerates this process. It gets you from New York to L.

A. faster. It gets that input happening faster.

Now, again, to everyone who's listening, I write grants and we have written grants using electrical stimulation of muscles, reviewing that latest research and adding electrical stimulation to your exercise program dramatically increases your nerve growth factors.

And it's the nerve growth factors that really help rebuild and repair my mount. And, you know, you've all heard my remarkable story of how much function I was able to improve.

It was diet, it was exercise, it was supplements and it was electrical stimulation, working with a physical therapist very closely who treated me like an athlete.

And that led to remarkable, remarkable gains. So what what makes the newbie different from other devices? Because we've talked about how you've configured that in a very special way.

So the biggest difference is that we are using direct current as opposed to alternating current and alternating current as most devices are used because of this kind of interesting quirk of of history here where direct current the benefits were known in the sixties and seventies.

But there was also this big problem, which is that direct current would burn the surface of the skin. And it was a case of the baby being thrown out with the bathwater, that type of metaphor, because direct current, you know, the you know, people who are developing this type of technology said, okay, we're going to throw away direct current.

We can use alternating current because we can get it into the body without any of that risk of skin burning and, you know, it's more comfortable, that sort of thing.

Direct Current vs. Alternating Current

And so alternating current became, you know, everything that was being used for for decades, you know, from the eighties until now, four or five decades.

And so the the issue with alternating current is that you miss out on some of the benefits of direct current. So alternating current, the signal goes positive, negative, positive, negative.

You basically do this charges do this, dance back and forth and there's no net electric field. So when you have direct current, you create this electric field gradient.

So electrically speaking that that electric field is sort of like if you have a hill and you roll a ball down, it, it will roll down because of gravity.

Same thing. If you have a field, it will cause charges to move. And that is a really powerful phenomenon that happens are really, really powerful situation because it helps to orient the cells in a way that that helps with healing of bone and muscle and connective tissue for injuries also also also also helps with regeneration of nerves.

So we're doing doing a study right now. This this one is with neuropathy patients. But I'll share it here because it's a similar very similar mechanism.

So we're using the newbie on Polyneuropathy patients. So they have degenerative changes in the peripheral nerves. So we're working on that. These ones have changes in the in the feet, in lower legs.

And so we're seeing nerve axon regeneration, seeing re myelination as measured by EMG and nerve conduction velocity testing from using that, from taking advantage of these benefits of direct current.

And the control group is using a tens unit using an alternating current device. So we're seeing significantly more growth and regeneration. And this is something that, you know, probably by the time by the time this airs, you

know, data collection will be done.

Perhaps this will be submitted for publication. I don't know where exactly will be, but it should be out by the end of 2023, this study. So we're seeing these long term benefits in the realm of tissue regeneration, including especially for this conversation, including nerves.

And then. Oh, go ahead. How long does it take when you're doing a session? So we have someone who has significant disability. They find someone who is willing to work with them on their estimate.

What's the time course? What should they how long would it take? So each session, you know, oftentimes they're structured like a physical therapy session or maybe it's, you know, an hour to an hour and a half.

The good news about that is, is that, you know, there's there's several interesting commentaries in various journals talking about how the average work done in a typical physical therapy session for stroke patients, for most patients is not enough to drive these neurologic plastic changes.

But with technology like this, we can take that 60 to 90 minute session and make it so much more impactful that now it does become enough to start driving these changes. You cross over that threshold.

So so the sessions can be something like that for, you know, depending on on the setting, you know, and the individual's goals, you know, they may or may not be on the device for for an entire session or sometimes when their formal session is over, maybe they'll do extra work on it.

They'll set the machine on certain settings and and then do an extra 20 or 30 minutes while the therapist goes on and works with somebody else. You know, it can be something like typically that sort of block of time.

And then, you know, if people are doing I mean, you can make a case for trying to do something every day depending on the person's circumstances or if they're doing something two or three times a week.

We expect to start seeing functional changes. You know, in most most people see some changes within the first few weeks. And it could be something as minor as, hey, I feel the, the carpet fibers or I feel a little bit or a little bit of more sensation in my feet, or I have a little bit more ability to lift my foot where I had these drop foot symptoms.

Or it could be something. Or I feel looser. I feel like I can actually bend down and then and tie my shoe where some of that spasticity and tension is starting to diminish or and then over time, those compound to to hey I feel like I can actually take some steps now and get out of a wheelchair like, you know, see that takes time.

I don't want to diminish the work that goes into that, but we do have, you know, dozens of transformation stories like that where people have literally gotten out of wheelchairs and and returned to activities of daily living and regained their autonomy or gotten their driver's license back and things like that.

Treatment Time, Results, and Access

But that, you know, that can take months or one or two or three years to really make make those types of changes. So there's there's short term progress.

And then if you stick with it, there should be some some long term progress as well as others, you know, progress over over days and then weeks and then months.

But it varies for everybody. And you don't necessarily know how quickly people are going to respond until you until you start and try it. And now everyone who's listening, I, I started doing Eastham for the first time in 2007 when I could barely set up for 10 minutes.

That was all I could do. And now I can hike, I can bike, I can even jog on my treadmill 20 minutes slowly, but I'm jogging. I still like doing Eastham.

I love doing Eastham. And so I'll still do an hour or two a day because of the the cognitive benefits, in addition to, you know, my goal is to lift 120.

And so I want to maintain my muscle mass and be strong to 120. I know how someone access the newbie. So there's there's a few ways to do that. I actually if I make I close the loop on one other element of direct current as well.

So we talk about these kind of long term functional benefits. There also are these short term functional benefits because it was alternating current as that signal goes back and forth, you end up well even more, even more generally than that.

A lot of times electrical stimulation is about like causing muscles to contract. And there's there's benefit in that, especially if you can't do it on your own.

But this in some settings we'd want even with with, you know, with our device, with the newbie for neuro bioelectric stimulator, even with that, we, we sometimes cause muscles that contract.

But a lot of times we're changing the settings to to where we can can operate with this level of precision to to bypass a lot of contraction and more specifically, talk to the nerves and nervous system more powerfully, more precisely, send those signals.

So that helps to create these changes in the direct direct current allows us to have that more precise signaling, kind of like running a software debugging program or more precisely, programing the software of the nervous system.

So there's that, there's that component. And then to your question about, you know, how people can experience this. So there's there's a few different ways and we certainly, you know, invite people if if this is at all intriguing to you and you are a patient, there are a growing number of physical therapists, chiropractors, other professionals that are using this device, certainly here in the United States and then also in other countries, too.

So I invite you to go to our website, which is WW W dot nude outfit. So just like this light behind me new but with a with a dot in the middle nude outfit, go there and then you can click on the patients for four patients link and there's a map there where you can look up the network of providers.

So we certainly invite you to work with somebody if there isn't anyone in your area or I know it's difficult to to drive around or find a ride or something like that.

You know, we have opportunities. We have a team, a physical therapist that can oversee your program. If you are interested in getting a device at home.

And then we also, with the support of Dr. Walzer here, have started offering these RMS boot camps at our clinics. So we're in Austin, Texas. And for for most patients who or other patients of other autoimmune or degenerative conditions, we have these mass boot camps where you can you can come and spend three days with us here in Austin and you get to one on one treatments every day.

And then we do a group lunch and learn or a group activity. And of course, we have walls, protocol compliant meals. And it's great because, you know, 90 to 95% of people actually notice some improvement even in that first weekend.

And then many of them are motivated to either continue with their local therapist when they go back, or some of them will take a device home and continue with the custom program, things like that.

And then if there's any any clinicians listening, you know, we certainly have trainings and a whole certification program to teach these methods and provide the equipment and things like that.

So also on our website, there's a providers link that has more, more information there. Again. So the people who

would be probably most interested are physical therapist, I suppose.

Occupational therapists, total chiropractors, yeah. How about athletic trainers? I don't know. Do athletic trainers use devices? Well. They do. Yeah. We've got, you know, 20 at the time of this conversation about 25 professional sports teams across, you know, Major League Baseball and AFL, all the different leagues using this, you know, the dozen plus universities effort Division one, athletic departments using it.

So yeah, athletic training, it's a big, big application there because their athletes can, you know, get back on the field faster, certainly recover faster.

And then also, you know, they use it for movement prep and muscle activation before practices and games and they use we have a vagus nerve stimulation protocol to help with recovery and heart rate variability and resilience and, you know, managing the stresses of of a season and all that stuff.

Athlete Mindset and Closing

I, everyone I love my newbie. I do newbie a 1 to 2 hours every day and I do the vagal program in the evening before bed. Certainly has been very helpful for my sleep as well.

So Garrett, this has been truly wonderful. I could talk to you all day of course, but if you're going to have people do just one get one nugget from this conversation, what would that be?

I think I think it would be that mindset shift that we talked about a little bit where if if, you know, many of the patients that we talk with that have Ms.

or other neurodegenerative conditions, you know, don't don't think of themselves as athletes. But I would highly encourage you to to create that shift and think of yourself as an athlete, because what is an athlete?

Do an athlete trains hard, right, gets their training and not just once, but day after day, week after week, month after month, year after year. And an athlete also supports it because if you train hard, if you do your work, but then you, you know, you go stay out till two in the morning because you're drinking at the bar or whatever, right?

Like that undoes the benefit of training. So it's not just the work that you're doing, but it's the lifestyle support. It's following the walls protocol.

It's it's your sleep habits. It's, you know, taking care of everything so that you're supporting, so that you maximize not only your ability to do that work, but to recover from that and adapt from that.

Because the magic happens during recovery. The rest of, you know, do the other 22 to 23 hours of the day. So, so thinking like an athlete in your preparation, your perform, your your training and your recovery.

Okay. Then finally, how do they find you on the web? Best place is W WW dot nude outfit and EU for neurological any UK site. And is that dot com or dot org or.

Just just does it? Yeah. Yeah. Oh, perfect. Okay. This has been wonderful. Thank you so much. I can't wait till I see you again. Thank you. Dr. Wells.