Introduction and neuroplasticity overview

Welcome to another wonderful interview for the MS and NeuroImmune Summit. Now I'm here with Doctor Gretchen Hawley, who is a doctor of physical therapy, and she's a multiple sclerosis certified physical therapist.

And the really she's one of the earliest specialist with this designation. And she has a wonderful M. S. specific exercise program to help people restore and improve their function, to improve their walking, and regain and maintain their independence.

She has a wonderful online program which I recommend highly. And she has a wonderful program, The Missing Link. So, Ms.. Link uses social media to create more awareness and more education around neuroplasticity.

And we're going to talk about that during this wonderful interview. Okay. So did I miss anything in that intro? I don't think so. I think you touched on all the bases and thanks for having me again.

I'm excited to be here. Well, did this one more really, fun connection. Gretchen's a new mom. She has a little girl that's, four months old. I'm a new grandmother. I have a grandson that's four months old.

So we'll do a lot of, bonding over the little people in our lives now. Yeah. So. And it's actually been really cool because you can see neuroplasticity happening in babies.

Like. Like my daughter's four months old, as you just said. And it's so cool to see her just learning new things. And the way to learn new things is through neuroplasticity.

So it's been a really cool thing to be part of because for so long I've been seeing neuroplasticity in adults. But this is so different. And let's explain neuroplasticity for our listeners who may not be quite familiar with that term.

So neuroplasticity is something that works in one of two ways. Overall. The big picture is it's the reason that your muscles can get stronger, even with a progressive disease like Ms..

And the one of two ways that it can work is option number one is it can strengthen your neural pathways. Option two is it finds a new neural pathway. And if this is the first time you've ever heard of this, that might still sound like gibberish to you.

So I like to think of neural pathways as Wi-Fi. It's the connection between our brain and all of our muscles, and each muscle has a different neural pathway.

So when you have Ms.. Your neural pathways that should have nice thick, plump myelin around it. That myelin is disintegrated. It's damaged. And so more likely than not your brain is going to try to find a new Wi-Fi connection, a new neural pathway, because that current one might be 2D myelinated.

Or if you just have a little bit of weakness, your brain actually is going to try to strengthen the neural pathway that is already there. So it can work in one of those ways or both those ways depending on the muscles.

You know. I'd like to throw in a third way that can happen if you quit using it, it will disappear. Yeah. So it's sort of like the path through the woods.

If you keep walking, it will be there. You can get through it, but if you stop going, it will be overcrowded with weeds and you'll be able to get through it anymore.

So if I quit using my hand because, it's in a cast, when the cast comes off, my arm is going to be very weak, and I'll

take a lot of work to get the strength back in my arm.

Functional walking exercises and movement breakdown

Yeah. And the way that neuroplasticity would work in that case, in the case of if you don't use it, you lose it is more of that first option where it's strengthening a pathway that's already there.

More likely than not, when it is that situation where you've just been sitting a lot and you haven't been using your muscles, your brain won't necessarily have to find a brand new way, a new neural pathway.

There are some cases where that that would happen, but for the most part, it would be more of the first scenario where we're strengthening the pathway that's already there.

It's just not working well because you haven't been using it either correctly or at all. So let's say you're a physical therapist. You're all about the exercise.

So what are the exercises that you think of as most important for our audience? So there's actually two things that I think of when I think of the most important exercises.

One is it has to be focused on neuroplasticity. And what I mean by that is we're not necessarily focusing on the muscles like a traditional physical therapist or orthopedic physical therapist would.

We're focusing on the neural pathways that Wi-Fi connection because in mass, the reason that your muscles are weak isn't just because your muscles are weak, it's because the Wi-Fi connection, that neural pathway is weakened due to demyelination.

So we have to do exercises that focus on that. And one way to do that is through functional exercise. So functional exercise means not just exercising with general exercises to get stronger or better balance, but exercises specific to the goals that you're hoping to work on and to improve.

So, for example, if you wanted to improve your walking, you would do exercises specific to walking. Not just practicing walking as a whole, but really break it down and practice each individual step of walking as an exercise.

So we're doing more steps. Maybe we have to break that down a little bit more for our listeners. Absolutely. And if you don't mind, I'd love to do a demonstration because I'm a very visual person, so I'm sure that'll be very helpful.

Okay. So I'm just going to back up here and I'll show you exactly what I'm talking about. So again, this specific situation is if someone is looking to improve walking right, taking taking stronger and more balanced steps forward.

And this would also apply for backwards. So when you have this goal, a lot of people think, well let me just work on my walking and they might have a mobility aid and they're just practicing walking and that is a good exercise to do.

But what functional exercises really means is take this activity, this goal of walking and break it down into as many movements as possible. So we want to be thinking, what do I need to do to bring this leg forward?

And the first thing I need to do is shift my body weight forward. If I don't, if I keep my weight back here and I go to pick up this leg to move it forward, I'm going to fall backwards because I have too much weight on this leg.

So the first thing I need to do is shift my weight forward. The second thing is bend my knee. The third thing is lift my ankle. So if you drop foot, that's going to be a big one.

The fourth thing is bring my knee up. The fifth thing is to straighten my knee. Then I need to put my heel down. And all while that was happening, I was standing on one leg.

So that's the seventh movement. So that's us breaking it down. But from here. Now, what you need to piece

together is that each of those seven movements can be its own exercise.

So if we start with this first one, the first step was shifting your weight forward so you could practice shifting your weight forward and back. As an exercise, maybe you do ten repetitions or 20 or 30, however many you can safely and with good quality.

Then maybe you do the second thing, which was bending your knee. And you can of course hold the mobility aid, but you practice bending your knee as an exercise.

Now, if that exercise is too challenging, I will say this is the hardest movement for like 95% of my clients that I work with. If that's too hard. Instead of doing it standing, maybe it would be easier if you did it sitting bending.

You need a seated position. If that's still too challenging, maybe you'd feel easier if you're lying on your side, perhaps in bed or on a couch and you're trying to bend your knee that way.

So if it's too challenging, find a position that makes it easier so that you can do the movement successfully. The more repetitions you do, the more opportunities there is for your brain to strengthen or find those neural pathways.

I'm going to ask another simplistic question. Former athlete. We like to do things sometimes fast, as fast as I can. So should they try to do this fast?

That's a great question. Yeah. That there's kind of two sides to this answer. And it really depends on what your goal is. I have a personal preference to always have my clients do these slow at first go nice, slow and steady, making sure you that you're activating the correct muscles, not other muscles that are overcompensating.

But once you are sure that you are strengthening the correct muscles, then you absolutely can try them at a faster pace. If one of your goals is to walk faster because speed is a completely different exercise category than strength.

So, so often I'll actually have my clients getting better with their strength and they'll say, Doctor Gretchen getting so much stronger, but I'm still so slow.

Why is that? And it's because they're not practicing speed based exercises. So eventually, yes. But initially I like to go slow. You know, I think of this sort of like learning a new piano, please, that you start very slow, intentionally slow as you're learning this complicated fingering.

And then once you have the fingering correct, then gradually you increase the tempo and then you eventually can you can play with amazing speed.

Visualization and practicing in real-life environments

I'm watching my kids play, you know, amazingly fast, up tempo, but they always start very, very slow and gradually increase that speed. Absolutely. I love that analogy.

And it's so one thing to think about and to point out, I think, is how challenging it's going to be, because if we don't anticipate the challenge, then we might think that it's not a good exercise for us.

Like if you tried to do that knee bending exercise and you think my leg didn't move at all. What's next? I'm not going to do. It's not working. Give me a different exercise.

But with neuroplasticity, the way to get that neural pathway working or to find a new neural pathway is to continue practicing the thing that's hard, even practicing the thing that's not moving.

So if your leg didn't move at all, you should still be practicing that exercise. Try it in a position that makes it easier, but still try it. Still do it.

That's the way to get your brain to light up and try to find a way that does work. Is there a way, a role for visualizing, that movement, even if you can't move that you're visualizing your leg moving?

Absolutely. And I want to quickly share a story from a few years ago. I was working with one of my patients in person, and he had very little movement in his legs for any movement for lifting, bending, etc.

so we were focusing on visualization, and he would do it a lot throughout the day before bed, first thing in the morning. And by the end of our sessions of working together, he actually did have more movement.

And he said that when he was visualizing, he could actually feel a tingling sensation from his brain all the way down to the body part he was trying to move.

So if someone is trying to visualize picture what it looks like, what it might feel like, it really in depth to the visualization. Not just generally thinking about bending your knee.

And do we visualize a time when we were using that limb, that movement as well? Is that part of the visualization process? Yeah. So what I like to do for visualization is, first and foremost, picture yourself doing the exact movement that you're looking to improve.

So in this case, if you're looking to lift your leg like bring your knee up, then visualize your knee coming up, maybe from a seated position or a standing position.

So get really specific. But then also visualize yourself using that in a real life situation. Like we need to lift our knee up when we're walking. That that was one of the components.

So you could visualize yourself doing this as a movement. And then you could pick visualize yourself walking. But your focus is on lifting your leg as you walk, so you can do a visualization for the exercise itself as well as the whole movement.

Wonderful, wonderful. So, shoot, is there a particular, location where should do these exercises? Should I be going to the gym? Where do we go? Yeah, I love this question, because everything that I do is about removing barriers, and I think everyone should do that for themselves.

And going to a gym is great if you have access to a gym. Absolutely. But it's not necessary. And there actually is a best location to exercise when you're working towards specific goals.

So it all boils down to what goals are you working on? If you have a goal of getting into and out of your car easier, and maybe not using your hands as much to lift your leg in and out of the car, then the best location to practice exercises for that would actually be in your car or out right outside of your car.

Because one thing with multiple sclerosis that is important to know is that we someone with Ms. doesn't have a brain and spinal cord that has the same carry over as someone without Ms..

And what that means is you could be practicing this exercise of lifting your leg up and down. You could practice that here in in your home and in my office right now.

And maybe you get really strong, you get full strength in that movement. But then you go outside to your car and you try to do the same thing, to lift your leg, to get it in, and it doesn't lift or it barely list.

It's because your brain doesn't understand that that is the same thing. Is this because the environment threw you off? So exercising in the similar or same environment as your goals is going to be the best location to exercise.

So again, this really comes down to what are my functional goals and what are the exercises I'm doing to achieve those functional goals. Exactly. And if someone doesn't know what functional goals are, think about your daily activities.

Like from the moment you wake up to the moment you go to bed, what things, what movements, what activities are challenging for you to do, or at least more challenging than you'd hope they were.

So what about going down the stairs are going up the stairs. If that's the case, you want to do functional exercises at the stairs if possible, or getting in and out of your car.

Getting dressed, getting in and out of your shower. Getting up the floor, getting getting dressed, going grocery shopping, feeding myself, putting my groceries away or in the dishwasher.

Yeah. And one thing that a lot of those things that we just mentioned requires is a squatting type movement. So a simple way to think of the best location could be practice doing the squat exercise in your bedroom, because you'll probably need to do that movement when you're getting dressed or at least getting in and out of bed.

Practice a squat exercise in your kitchen because you'll need to do that if you're unloading the dishwasher or loading or unloading groceries. Practice that in the bathroom, because when you're sitting down or standing up from the toilet, you need to squat.

So knowing which exercises to do, which are the functional exercises, and then also implementing it into the best location. I think the common theme I'm hearing is there are a lot of these exercises we should really be doing in our living environment, our homes.

Right? So going to the gym can be helpful, but it may not always translate into your functional goals. If you aren't incorporating doing some of these activities and exercises in your home.

Right. And all of everything we're talking about today is specific to people who aren't just looking for improved strength. And improved balance is a general improvement, but you've specific things that you're hoping that strength will improve.

Another quick example of this is I was working with one of my missing link members. She has a daughter who is going to be getting married, and so we were talking about these walking based exercises because she wants to be able to walk her daughter down the aisle.

And so we reviewed all the exercises. And then I said to her, once you get stronger with these and you feel like this is appropriate, her daughter is going to be getting married in a church.

And I said, go to the church and ask if you can practice these exercises.

Balance training and fall prevention

And walking down the aisle and go a few times a week if you can't, like get in that environment, because not only will that be better for your functional exercises, but it's great for your mind.

And this is true if someone's looking to improve their walking on uneven surfaces as well. Like the sidewalk grass, cobblestone sand, whatever. If you never practice your exercises or moving in that environment, then when you finally get to that environment, your brain's going to say, whoa, what is this?

I'm scared, I'm nervous. I don't know what to do. But if you've been practicing there, it won't freak out and your body will move much more, as it should, versus being in a heightened anxiety state.

Well, this this whole conversation got me thinking about, you know, my grandson and I realized one of the things I want to get more comfortable with is carrying weight up and down stairs.

So now, in addition to my strengthening routine working on dumbbells, I realized am I got to start carrying my dumbbells up and down the stairs one arm at a time.

So I'm doing 20 pounds. My goal is to get 30 pounds going up and down the stairs, and so I think it's really important for us to think about these kind of functional goals and what we could be doing to help attain them, but which gets me to another question.

What about balance? I know falling in fear of falling is a common concern in my in my patients, and I'm sure in yours as well. What do we do about that?

So the first question that I like to ask, any time I have a patient who's saying, Doctor Gretchen, I want to work on my balance. Balance is really broad.

So my first question is when do you notice poor balance? Is it when you're walking? If so, when when you're walking, like is it when you're lifting one leg?

Is it when you're standing on one leg? Is it when the other leg is more like when specifically in your gait, do you notice the poor balance or is it the whole thing?

Is your balance off when you're reaching in your closet? Or if you're reaching down to pick up a dog off the floor or, you know, pick up groceries up for when is your balance not great?

And then we're going to choose balance exercises in those specific situations. So for example, if you had said that balance is the most tricky for you when you are reaching in your closet, if my closet's over here.

So if your closets there, we would have you get close to your closet and practice reaching in. So this is more of a weight shifting exercise where you're practicing moving your weight over to this side and then to this side.

So this is a really great weight shifting balance exercise. If it's when you're walking, when we're walking, we're in this staggered stance. The majority of the time in both one foot forward than the other.

So you could practice shifting your weight forward and backwards. As I mentioned earlier, if shifting your weight forward is challenging, walking is going to be challenging.

So the goal would be to get as much weight as you can on this front leg safely without, you know, wobbling too, too much even if you need to use a mobility aid and then back forward and back and you do the same thing on both sides.

So I'm glad you asked this question, because a lot of the times that people go to physical therapy for balance, they'll do, you know, balance exercises like this with their feet together and maybe they'll even close their eyes or tandem stance like this, maybe even with their eyes closed.

And that's great, but it's more static and it tends to not have as much of a carryover. So you could have great balance like this. But you're walking is still super unbalanced.

So making sure your balance exercises are functional just like your strengthening ones get into the same position and location where you lose your balance and practice some weight shifting in those areas.

So if you're having issues with falling fear or falling, take some time to figure out what that is. The circumstances where you're falling or you are afraid you're going to fall.

Exactly. And when you do that, you might be thinking, well, I can't do those exercises because I'm afraid of falling when I'm doing them. Then make them easier.

Modifications are always available. That might mean not shifting much weight forward and backwards. Maybe assist a little bit forward and back or side to side.

Or maybe it means holding on to a countertop, or having someone nearby, or not doing it in the functional, as I like

to call it. The functional location at first, do it somewhere else and work your way towards getting to the exact situation.

Now here's a tip I've used in my practice. I'm going to invite you to comment. I put people in the hallway if they have a hallway, what to do, their balance exercises.

So if they're going to tip side to side, their shoulder will hit the hall and they are going to go down I love that. Yeah, absolutely. If that's a perfect place to practice at first, if you do feel like you're at risk for tripping or tipping because you have that security right there.

Okay. So let's talk about strength and stamina. We have somebody who who would like to have a little more stamina or a little more strength. And what tips you have there.

So stamina is a different category of exercise than strength. So similar to as I mentioned earlier, someone might say I'm getting so much stronger. Yay!

But I'm not walking as fast. Like why? Why is my speed not improving? It's because you weren't doing speed exercises. Similar situation here. You might notice you're getting stronger and maybe even getting faster, but you can still only walk.

I don't know, 50ft or whatever it is. It's because you weren't working on stamina or endurance. And so when you're working on stamina or endurance, there's a few things that you can do to improve that.

Number one would be to do more repetitions as long as you have good quality, instead of stopping at ten, maybe do 12 or 15 or 30, however many you can do the more you do without rest breaks, the more you're working on stamina.

Another thing that you can do is take shorter rest breaks, so maybe you're still doing ten and then you take a rest break. But instead of resting for 30s, you only rest for 15 seconds.

And then the third thing that you could do is with the same exercise, hold it longer.

Stamina, strength, and workout planning

So if you're doing the exercise where you're marching, so maybe you're doing this movement instead of going at this pace, maybe hold and down. The longer you have to use a muscle without resting, the more you're working on stamina.

So just holding that position, even just for a few seconds longer, can be a great way to work on stamina. And then the final way to improve stamina would be to actually practice walking further, or doing a movement for however long you actually need to do it.

So in the case of my patient who wants to walk down the church aisle, she would practice walking the whole distance instead of stopping at a few test set and then implementing all of those together so you could work on 1 or 2 or all of those.

Okay, so that was stamina. And the other part of the question was strength. So I go, we'll talk. In my case, you I want to be sure I can carry 30 pounds, up the stairs.

So what should I be doing? So when it comes to strength and specific strength like that, like carrying 30 pounds up the stairs, the first thing that you want to do, of course, is pick the functional exercise that relates to the specific goal that you have.

But then once you're able to do that, you can start adding weight to it. So I always like to start really light and easy meaning add 1 pound weight. So just super lightweight as you're doing the exercise.

So in your specific case you could literally hold on to a 1 pound weight as if you're holding on to your grandson. Or you could put it in a laundry basket if that's better for your grip.

And then 2 pounds and then maybe 5 pounds and you gradually increase. But if we're talking about the squatting and maybe you're someone who plots down and you want to control your plopping, we'll do the squatting exercise.

And then eventually maybe you'll hold on to 2 pounds or 5 pounds or whatever way you have a goal of being able to sit down without popping or pick something up off of the ground without it being too heavy for you.

So those strengths, how do you improve strength is more of those functional exercises that we were talking about initially. Based on your goals, you know, the athletes who are going, you know what, my daughter is going to the gym lifting barbells.

And I'm so impressed. She's, you know, advancing nicely. She's very careful to have a heavy strength day. And then, she does sort of yoga the next day.

So, you know, do we have to do the same with our Ms., you know, a strength day and then a rest day, or can we do strengthening every day? What do you advise?

So the research that I've seen suggests switching it up. You wouldn't want to do strength every single day and be skipping balance or stamina or flexibility, like stretching, like all these areas are really important.

The most important one will depend on you, your goals and what's challenging for you. But it is good to mix them up. And not only that, but research also shows that if you do them out of order that well, that can also result in better strength and function.

So don't always do the same list of exercises in the same order every time. Switch them up. So you're doing them in different, different orders I guess.

So maybe the last exercise today will be the first exercise the next day, and going slow and steady is important in the beginning too, because we're trying to strengthen the weakest muscles, not the muscles that are already strong and want to overcompensate for you.

So they should be challenging. They should be making you feel like you have to put a lot of effort in. And I like to remind everyone that I work with that success with strengthening or stamina or any of these exercises isn't how much movement do I see?

It's how much effort am I putting in? So that's what you should really be focusing on, not how high did my leg lift. So if you're focusing on that, you'll likely feel much more discouraged.

And I think I heard I should strength training today, but it might be good if I did, a slightly different focus tomorrow. Whether it was my stretching, in balance.

And then the next day, maybe I'm doing, endurance, or I might go back to strength training. Right. And you can, you can combine several on different days.

So maybe today you do it's maybe it's all strengthening exercises tomorrow. Maybe you do two strengthening exercises, but a lot of stretching the next day.

Maybe it's one strengthening exercise, two stretching. And then if you balance so you can mix and match each day. It's not like one day has to have one focus.

Okay, great. Great one. How long should I workout? Should this be like a an hour that I'm doing every day? What are you having your your clients do? Yes. So this is a really good question.

And part of it depends on lifestyle and personality. So if you're someone who prefers to just do everything all at once, get it out of the way so you don't have to think about it later.

The number that I typically of my patients shoot for is 25 to 30 minutes in one sitting. But if that's either too much for you, maybe you don't have the energy to do that or you don't have the time.

Like your lifestyle is such that you just don't have the time to sit down for 25 or 30 minutes. Research shows that doing exercises throughout the day can be just as effective as exercising all at once.

So instead, for my patients who have that type of lifestyle, I will usually suggest do one exercise for about five minutes, including rest breaks in the morning, one late morning, one early afternoon, later afternoon, and then before dinner if you can.

If you don't have energy before dinner, get a different one in earlier in the day so you can spread it out. But if you are doing it all at once, I am like about 25 to 30 minutes when you're being really intentional, like we're talking about here with functional exercise, functional location, it doesn't have to take that long.

So if you're thinking, well, I can't do it, I need an hour to exercise and I don't have that. It oftentimes does not take more than more than 30 minutes.

I find, you know, and I tell my clients who aren't exercising at all, even if you just start with five minutes. Yeah, you know, that's perfectly fine. Yeah.

Just go ahead and start another tip that I use. And it really what your opinion on this because I have people who are wheelchair dependent, people who are basically bedridden.

And so we're starting them on a very simple exercise program. And my request then is we're going to pick a starting point for that person that is often five, maybe ten minutes at most.

And I tell them, if you aren't back to your usual level of energy for you in 2 to 3 hours, we had to do too much, and I gave you too big of an assignment.

And I want you to back off. How do you approach the person who is more seriously disabled when they get started? Yeah, I agree, I share the same timeline.

I usually say a general rule of thumb to know if you overdid it or not. Is that two hour mark? So you said 2 to 3. So right in that area, if you're still feeling worn out from that, then it was too much.

And if you are in that situation where it was too much, the first thing is do less so. And this is such a hard concept for people. It doesn't sound, it could be challenging, but for someone who only did ten minutes or even only did five minutes, they might be thinking do less.

How much less can I do? I only did five minutes and do less, so maybe only do one exercise, one round of ten repetitions. Just one exercise ten times. That's it.

Even if that only took you 30s great. Done for the day. You know, start really, really basic and see. Okay, how did I feel after that? How did I feel 2 or 3 hours after that?

If you felt okay, then maybe the next time you do two rounds of that exercise or one round of that exercise and add a different exercise, so you're doing two different ones.

If you didn't like that approach, you could always instead focus on not just which exercise you're doing, but how long are you holding it for? Maybe you just did one exercise too intense.

So don't hold the exercise as long. Do fewer repetitions. So there's a few different ways to get started from scratch.

But the second component that is definitely worth considering is your mindset around it.

If you're thinking, well, this isn't going to was ten exercises is going to do for me, what's ten repetitions going to do? You're not going to stay consistent for the long haul, and then you won't get to build up your endurance and your strength.

So really understanding mentally that low amount of exercise is helpful. It is productive. It can help you progress as you get stronger, but you have to start somewhere.

And being on board mentally with that is a huge component. Gretchen, this is so wonderful. Again, everyone who's listening exercise is medicine. It is some of the most powerful medicine.

And you're in control. So, Gretchen, you have so many wonderful resources. Could you please tell our audience how to find you, in, just a little bit about some of the wonderful resources that you have there?

Yeah, of course. So you can find all of my courses and programs and whatnot on my website, which is missinglink.com spelled Singlink. com. And then I also have a podcast called The Missing Link, a book called The Missing Link.

And I'm on social media as Doctor Gretchen so you can find me in any of those areas. Okay. Well, this is, wonderful. Thank you so much for being part of the MS and Neuroimmune Summit.

Of course. Thank you for having me.