

## **Victory Summit: Exercise**

### **Bas Bloem: Cognition, Mood, and Exercise**

Davis Phinney Foundation

*Note: This is not a flawless, word-for-word transcript, but it's close.*

Melani Dizon (Director of Education and Content, Davis Phinney Foundation):

Dr. Bloem, Professor Bloem, can you tell us a little bit about yourself and how you got into the field of Parkinson's, and then in particular interested in the effects of exercise on people living with Parkinson's?

Bastiaan (Bas) R. Bloem, MD, PhD, FRCPE (Consultant Neurologist at the Department of Neurology, Radboud University Medical Centre, Nijmegen, The Netherlands):

That's a lot of questions. all in one go. Yes. so, I'm Bas Bloem. I'm a neurologist. I see patients every week, I should say individuals living with Parkinson's. I don't like the word patience or persons. And I'm the director of one of the largest Parkinson's and movement disorder centers in the world. We're growing fast, like a Dutch cabbage, you could say. They grow very fast. We're very active in the field of innovative healthcare, patient-centeredness digital medicine healthcare innovation in general. Large scientific group, about 36 Ph.D. students. And I wear multiple hats. I'm a longstanding advisor to the Michael J. Fox Foundation. And I serve on many other boards including being the co-editor-in-chief for the Journal of Parkinson's Disease. And my interest in Parkinson's was a lucky coincidence.

My mother had multiple sclerosis. She got married in a wheelchair. And as a young child, as long as I can think, I wanted to become a doctor and not just a doctor, I wanted to become a neurologist and not just a neurologist. I wanted to become a multiple sclerosis expert. So, I went into medical school and in the third year of medical school, started to work on neuroimmunology because that was relevant for multiple sclerosis. And within a few months, I realized that in order to obtain a residency position, which was horribly difficult, it still is I wanted to go to the United States to boost my career. And I asked my professor, could you somehow help me on my way to do some work in the United States as an intern? And he said, well, yeah, Bill Langston happens to be here next week, and I can introduce you to him.

I said, oh, is he an MS expert? Said, no, he's one of the leading guys in the Parkinson's field. And I said, But that's no good. I want multiple sclerosis. And he said, Well, but Bill lives in the Bay Area. I said, All right. All right. Somebody needs to do the dirty work. So, I went to the United States to do a project on Parkinson's and balance control, which is still one of my sort of sub-specialties. And from the day I met people with Parkinson's, I have become fascinated by the complexity of the disease, and by the resilience and the extreme creativity of families with

Parkinson's in dealing with this ordeal. And I've basically forgotten all about MS. I couldn't even treat multiple sclerosis anymore, and now it's been my life mission. It sounds maybe pathetic always, but, or, or, or, but I, you know, it's my mission to help people with partnerships, to create a better world for all those families in the world and forgotten all about MS. And here I am

Melani Dizon:

Wow. Well, that is a very happy coincidence for us.

Bas Bloem:

It is, yes.

Melani Dizon:

Good. And so, you want to talk a little bit about your center, because it was, it's, you know, served as a model for so many in the world. And how did you know, like when did you decide, hey, this needs to be a holistic thing? We can't just be treating this one aspect of somebody with Parkinson's. How did you know, and when did you know, and when did you get it started?

Bas Bloem:

Well, part of it was inspired by my quote-unquote, other life. I've also been a semi-professional athlete. I used to be a volleyball player in the Dutch national volleyball team, the under 18. I played in the Dutch Premier League, the highest volleyball level for several years. And as a volleyball player, I became really aware of the fact that volleyball is a multidisciplinary team effort. I was really good at the service reception, but I received virtually no sets because we had three guys that were exceptionally good at spiking the ball. And then we had a setter and a guy for the defense. And together still gives me great pride. We beat the Russians for the first time at an international competing event. The Russians always came from Moscow, beat the out of everybody, pardoned my French, and then went back with a gold medal, and we beat the Russians in a wonderful game that ended well after midnight with this multidisciplinary team.

Bas Bloem:

And in fact, I was in the starting lineup, and five out of the six players in that starting lineup, one Olympic gold in Atlanta. And the sixth guy sitting right here in front of you, he became a doctor. So, and then all fairness, I was a good player. I was a really good volleyball player, but not good enough for the real to become a real athlete. I had my part, my MS mission still. So, there was no time to become a full-time athlete, but my volleyball career did convince me that multidisciplinary teamwork is necessary. And then I also developed a firm belief in physiotherapy because I was regularly injured as an athlete. And physios brought you back onto

the pitch. So developed a firm belief in physiotherapy, but at the same time, I also realized we needed better evidence for physiotherapy.

Bas Bloem:

So, this is what stirred, you know, my research into this allied health arena. And I've always been, I think as a child onwards, a very we say in Holland, I like flat organizations. So, I think very horizontally. There's no hierarchy in my team. The youngest student, you know, the greatest junior on day one is as important as I am. And if anybody speaks, we all listen. And if there's something valuable, you know, we'll pursue it. So, I strongly believe in this teamwork, in horizontal thinking, and collaboration that includes the role of individuals living with Parkinson's. In my team, we do nothing for people with Parkinson's. We do everything with people with Parkinson's. Co-Creation is a core word in our, in our team, and that gives me, you know, so much pleasure, and it makes the work so much more valuable and worthwhile.

Melani Dizon:

Yeah, I mean, I think when we, you know, talk to our community, the people who are living the best with Parkinson's are taking that holistic approach. They're looking at every sort of aspect of their life. They're looking at how much they're exercising, they're looking at their nutrition, their community connections, their mental health, and all of those things. And so, I think it's really great that you have this model that everyone else can look at and say, oh, well, we're having success, right? Like, these people are living better than people that, that don't pay attention to these other

Bas Bloem:

Friends. Absolutely. You know, in many ways. So, when I lecture about Parkinson's one of my sort of opening slides is two cyclists it's Mathieu van der Poel, a famous Dutch athlete these days. And Valin art is equally famous, a wonderful cyclist from Belgium. And in the round of longs macho on the pool beats the other guy by less than the thickness of a tire. I mean, it is the closest finish in the world. And I show that photo, which is brilliant. And I say the reason the one guy beats the other guy, is because the differences between athletes are so small is you need, everything needs to be perfect. Your sleep, your exercise, your gear, your physiotherapist your, your stress levels, your nutrition, and having Parkinson's is like being a professional athlete. Everything needs to be perfect. Your sleep, your diet, your stress levels, your exercise. The only way to fight Parkinson's disease optimally is to have that holistic approach.

Melani Dizon:

Right? Okay. So today part of that, that holistic approach we're going to talk about is exercise and how it impacts thinking, cognition, mood all of those things. So, can you talk a little bit

generally about what exercise does for the brain, not necessarily just the Parkinson's brain, but the brain? Like what value is that exercise for the brain?

Bas Bloem:

Right. Well, first of all, if I can expand even a little bit further, exercise is not just good for the brain, and I'll come to the brain in a minute. Exercise is also important to optimize regular bowel movements. Constipation and slow bowel movements is a core feature of Parkinson's that interferes with the efficacy of oral levodopa medication. So, exercise is part of the multifaceted approach. To maintain regular bowel movements is critical. We know that osteoporosis bone weakness, it's a common feature in Parkinson's, which combined with the risk of falls, needs to hit fractures. And maintaining bone strength requires exercise. So, the benefits of exercise extend well beyond the brain. And these are just two examples. Not even talking about cardiopulmonary health, et cetera. Then in general, even before people started to look into the benefits of exercise on the Parkinson's brain, we know that regular exercise leads to slower cognitive decline and diminishes the risk of dementia, for example, and I'm a strong believer in the use or lose it concept and use it or lose it is both physical and mental.

So, we're talking mainly today, I suppose, about physical exercise, but for the folks listening mental exercise, and staying cognitively active is also very important. There have been studies to show, for example, that participating in the card game bridge helps to prevent dementia as an example. So, stay active is critical. And if you then look at the specific effects of exercise on the Parkinson's brain, what we now know from a number of studies is that regular exercise suppresses motor symptoms much like the drugs are doing. So, it is like a symptomatic therapy for Parkinson's. This has been studied most widely for the motor features, and by the motor features, I mean the slowness, stiffness, the tremor walking disability. So that improves with exercise. But I suppose today it's, it's also important to talk about the non-motor benefits. And new studies are popping up almost by the day to show that, for example, sleep improves with exercise mood can improve with exercise. And the benefits of exercise for these non-motor symptoms are probably even more important because many of those non-motor symptoms are more difficult to treat with pharmacotherapy, making exercise all the more important.

Melani Dizon:

Right. And, you know, you said sleep, and I think we can say sleep is just beneficial for everything when people get the right sleep. So, you know, exercise, it's, it's those downstream impacts. And so, like you said, it's exercise tremendously helps with motor symptoms, but using exercise to help with cognition and mood and sleep those have so many downstream impacts that it's one of those things that I want our community to look at and say, Okay, like, I do have control. I can, I can exercise, and I can impact these areas of my life. So, can we talk a little bit about cognition? First of all, what are you know, people here, mild cognitive impairment, they hear you know, cognitive decline, those kinds of things. What are we talking about when we

talk about cognition? And then I know that there are games and things like that that you can do, but how does exercise help with that? How does, like, actual movement help with that?

Bas Bloem:

Right. If I'll take the liberty of change. Just one quick word on sleep, you know if people don't sleep well, the day is horrible. And if you treat the nights, you will create better days. So that cannot be emphasized enough. And Parkinson's does not go on vacation at night. You have Parkinson's day and night, and we tend to focus our efforts on treating the days, and we forget about the nights, but you really need good night rest in order to be optimally fit during the day. And regular exercise during the day is part of that multifaceted approach. You need, there are like 10, 12 reasons why people with Parkinson's sleep badly. I'm not sure if we can address all of those here today, and I'll focus on your real question in a minute. But if you wake up in the morning and you don't feel well rested and or if you fall asleep regularly during the day, which is tell that your night is actually not good, then go see your physician and talk about it.

The even if you spend a lot of hours in bed with your eyes closed, it doesn't mean you sleep well. There's a phenomenon called sleep fragmentation which keeps people from reaching their deep sleep phase. So even though you may spend a lot of hours in your bed sleeping, it's a second-ranked sleep that doesn't give you that proper rest leading to excessive daytime sleepiness during the day. So, people may find themselves falling asleep while reading a book, watching television, even during dinner, or while maintaining a conversation. Very embarrassing. And it's, it's a tell-tale sign that actually your night is not okay. So, I'm just taking the liberty to

Melani Dizon:

Yeah, no, and right, like if they don't sleep well or tired, they're less likely to exercise, which then

Bas Bloem:

Exactly.

Melani Dizon:

It's all the other things, and they're less likely to eat well. Right,

Bas Bloem:

Exactly. Yeah. Then it creates that vicious loop. So back to cognition yes, thinking is impaired for many people. And I'm going to say something to do there that may sound scary, but I'll, I'll give them the nuance and the explanation right away. If you go on Dr. Google and you type Parkinson's and dementia, you will find many hits. And that sounds scary, but, but allow me to

explain. When a person has a particular cognitive function, for example, memory or planning or organizational skills, and that ability, that cognitive function has declined to an extent that it hampers you in daily life, that's when you tick the doctor's definition of dementia. So according to those criteria, surprisingly, many people with Parkinson's fulfill doctor's criteria for dementia. But that's a completely different type of dementia from say, Alzheimer's dementia. What does not happen in Parkinson's is the moment where you don't recognize your loved ones anymore your children or your spouse that memory becomes severely impaired.

That's not happening in Parkinson's. What is happening is that functions that can be ascribed to the so-called frontal lobe, the forebrain become rustier. And I used the word rusty, you know, to describe that it's not completely gone, but it becomes more difficult. And talking about organizational skills, for example, somebody who used to plan the trip we're going to Lake Tahoe tomorrow, and then you need to plan the driving, packing your car. And the man or the woman who usually did the planning is now not having the oversight anymore, which may even lead to panic or anxiety initiative making plans. The one who always said, Let's go out for a hike, is now sitting in the corner of the room and doesn't come up with a plan spontaneously, multiple tasking, doing two things at the same time. Something simple as walking and talking at the same time can become more difficult.

So those are all that we call executive functions. And those executive functions can definitely become more difficult as the disease progresses. And when it hampers you to an extent that it bothers you fulfill the criteria for dementia. So that's why if you go on Google, you'll find it a lot, but it's a whole different type of dementia. It's not to say actually that it's not debilitating, this lack of initiative the doctor's word is apathy can be really terrible for the spouse and in particular because the individual with Parkinson's doesn't bother much, but the spouse goes crazy. Come on John, let's do something. Oh, it's okay, I'm sort of sitting here. I'm fine. So cognitive functioning is part of Parkinson's. All the more reason to try and prevent that decline from happening through regular exercise. And there is some increasingly good evidence to suggest that exercise helps to maintain cognitive functioning.

There are particular drugs originally designed for Alzheimer's disease that can have a modest effect to improve cognitive functioning, particularly when the impairment is only mild. So, work on, on, on the, on those cognitive issues. And one thing that I should mention before I forget is that another feature that's quite common in Parkinson's is depression. Depression is common for at least two reasons. One is you may just feel sad, you feel grief because of the diagnosis, just like when you would lose a leg, right? You're, you're sad with the diagnosis. The other reason is that the lack of dopamine, which people tend to equate with motor disability, the same lack of dopamine, is actually the cause for depression. Also, implying that optimizing the dopaminergic medication is a good antidepressant. And the reason I'm mentioning depression is that sometimes depression can Moser or impose itself as cognitive decline.

And I actually just had a person in my clinic who I knew very well actually in through cycling, and he is doing the bike for Parkinson's and events with us. And he came up to me with tears in his eyes and he said, you know, the, my cognition is beginning to fail and I'm entering a more difficult phase. In hindsight, he had depression. And the good news is, we, we, we worked on the depression, we got him back on his exercise bicycle, and I saw him last that time and he had two thumbs up and was much better. So, when cognition isn't fine, just like the story about the athlete, everything needs to be right. Your mood, your sleep, you know, everything and you need to work on it,

Melani Dizon:

Right? Yeah. So, the mood is down because the cognition is down, but the cognition can be down because the mood is down there. It's just there, they're all working off of each other. So, what is there, I mean, let's talk a little bit about the right dose and frequency and that kind of thing for people with Parkinson's and exercise and its ability to impact cognition and mood. So, there might be, is there a prescription that's more, hey, this is, this is what it takes to help with non-motor or motor symptoms, but this is a little bit different. If you're working with non-motor symptoms, there's a, there's the quicker response if it's just a few times a week. Like what kind of dose and duration should people expect to do? Yeah.

Bas Bloem:

Yeah, that's been poorly studied. That's, that's the most honest and fair answer, but I can give you

Melani Dizon:

Well, that's interesting I have to say, because I frequently, and I'm sure you get it way more than we do, but they're just I heard from one person, they said to do this, another person said this, what is, what am I supposed to do? And there's so much conflicting information out there and people say, no, it has to be all intense at the same time. Some people say, to break it up, it can be in 32nd intervals. Like, what do we know about it?

Bas Bloem:

Yep. Yeah. So formally not much has been done in this field. It's probably because exercise is still a relatively young research topic particularly for cognition and the other non-motor symptoms, with hardly any research. But I can give you my opinion and tell you why. This is my view. First of all, there's two components to exercise that are both beneficial and that's important to be aware of. This one component is the so-called aerobic component. In layman's terms, cranking up your heart rate or panting while your exercise. That's the aerobic component, and that is beneficial, that is a proven effective component of exercise. The right doses here is not well studied. There is one really good study by Daniel CORs and his group

published in an elite journal where they compared 60% of maximum heart rate to 80% of maximum heart rate, and 80% was better than 60%, but 60% was better than nothing, meaning that the dose matters.

Nobody studied other doses, but it appears that 80% is just around the optimal is what our current feeling is. And the outcome in that study was in the motor domain, not specifically in the cognitive domain, but I have no reason to believe why it would be any different for the non-motor symptoms. So that is the intensity per workout. And this piece of advice is important for all the folks listening. The nerve that innervates the heart is also diseased in Parkinson's disease, meaning that for some individuals it is difficult to crank up their heart rate beyond 100 beats per minute. Now that is totally not dangerous, so don't worry about it. But the practical consequences are that if you try to titrate your workout according to your heart rate, it becomes a frustrating event. And I tell my patients individuals that they should dose their aerobic exercises based on their breathing rhythm.

And the right dose is when you start to pant, but you're still able to maintain a conversation, albeit with briefer sentences. So, it's as if I was doing this interview in just about this way, that's the right dose. So, you don't need an expensive heart rate monitor. And again, don't worry about it, just a practical consequence. Now, the second component is the volume of your activities, which in a number of studies now appears to be an independent second component of exercise. So, taking 10,000 steps at a leisurely pace is better than 5,000 steps. So simply doing more is also helpful. So, take the stairs instead of the elevator. Hop on your bicycle for your shopping instead of taking your car if that's doable, but the volume of activities is helpful. And then the third element, which I really like is that we always tend to tell people that you need to exercise for 30 minutes per day.

And I think many of us will recognize sort of that feeling of frustration. Where on earth am I going to find 30 minutes in my busy day? And some very recent work from, by Giselle Petzinger, is showing that 30 times, one minute is as good as 30 minutes in one block. And we now tend to refer to this as exercise snacks. And I like that concept. So, you treat yourself with a snack if you climb the stairs and the sort of the volume of activities that you need to reach is about 20 to 22 minutes per day of the snacks. So, and that's quite doable, isn't it? So, if you can't find the 30-minute slot in your daily regime, you know, climb the stairs and you think b there's another snack. You know you walk the dog, you've got your other 12 snacks, and adding up those snacks is as good as one block of exercise. So, volume, an important, aerobic component, is important. And think about snacks, I tell, and finally, you can tell this is close to my heart. I tell the people in my clinic to exercise every day, the norm, the international norm is at least three times a week. But if you have to exercise three times a week, there's always tomorrow,

Melani Dizon:

Right?



Bas Bloem:

If you have to exercise every day, there's no ifs and or butts. Get your gear out. Get your, get your in motion, right? And that, that's

Melani Dizon:

For people with Parkinson's and everybody, right? Like, I'm much better. I just exercise every day. There's no, yeah, that's just the way it is,

Bas Bloem:

Right? It's just the way it is. Yeah. Make it part of your routine. Consider yourself an elite athlete. And you know, the competition is also strong. The other guys are also out there doing their job. So, get on your bike, get, and then I know what your next question is what type of exercise? So, we talked about the dose, the intensity, the volume, and the snacks. It doesn't really matter what you do, as long as you do it and enjoy it.

Melani Dizon:

Everyone is happy, you just made everyone very happy, right?

Bas Bloem:

So, if you like boxing, do your boxing classes. If you like cycling, go ahead and do it. If you like running on a treadmill, brisk walking, swimming, doing what you like and or, you know, vary from day to day but do something that you like and that you're likely to adhere to. No study has done. Back-to-back comparisons, what seems to be important is the volume and the aerobic component, not the type of exercise.

Melani Dizon:

Well, I think you mentioned a couple of things that are critical, and I think everybody watching if they could have you as their doctor, they would take that option and this is the advice you're giving them, right? And so, they're going to listen to this. I think the part about it not mattering what it is really exciting for people because especially now there's so many options online. You might take a virtual boxing class one day and take a Yep. Dance for Parkinson's the next day, and a power Parkinson's and a Tai chi, and all of those things, which are really fast ways to get your snacks, right? It's, it's like a no-brainer. These people are just telling you, to follow along, you're done for the day, right? The other piece is just sort of like that rate of perceived exertion versus thinking they have to hit a certain thing on their heart rate or certain RPMs, everybody gets really caught up in I didn't do enough because my RPMs weren't a certain rate on the bike or that kind of thing.

And so, it's really great for people to hear that, hey, as long as I'm panting, as long as I'm, you know, moving, right? It's, it's enough. It is, it is enough. And then I think the other piece that's really important and empowering is that this is all an experiment for people, and they can learn, once you start to understand this exercise is important, you're going to start to feel the effects and the value of exercise. And then you'll, you might say, hey, actually I feel better when I go for a three-mile walk than I do, you know, after a really intense boxing class because for whatever reason it's just gentler for me. I actually get benefits from being outside in nature and walking my dog. And those are other impacts that, that go along with my exercise that helps me in my day. But that there is not one path for each person. I think that's a great, a great takeaway.

Bas Bloem:

Yep. Absolutely.

Melani Dizon:

And so, the research community is starting to look more at that. because I, it feels like a little shift. It feels like a little bit of a shift from like, you have to go this, this, this hardcore versus like, actually volume can make up a little bit for the intensity and, you know, do what feels good and you can split it up throughout the day.

Bas Bloem:

Yeah, no, that is, that is definitely a shift. And like I said, it is a relatively young area of research and I'm sure we're, you know, we're beginning to learn more and more about exercise. What I'm happy about is that exercise is now seen as a serious integral part of optimal care for people with Parkinson's. It is impossible for someone to come to my clinic and not to talk about exercise. Whereas I may have skipped that event, I may have skipped that like 20 years ago. We can also talk in future discussions, which I would love to do about the importance of nutrition and stress management, which are the two other big lifestyle factors which people also need to manage optimally in order to do well. But definitely, you know, exercise is critical, and it just occurred to me that there's one element of exercise that we haven't discussed yet. Strength training. Exactly. That's where I'll go next?

Melani Dizon:

All right, That's great. Yeah. So, I want to want to talk a little bit about that. What has been your experience with that? We're, we're actually for the first time, I'm really excited, funding a trial or research on strength training this year. So, I'm really happy about that. Can you tell, talk to us about why is that so important? We talked a little bit about osteoporosis earlier, so let's maybe weave some of that in.

Bas Bloem:

Right. So again, exercise is sort of a container term, isn't it? And, under that sort of umbrella is aerobic exercise, the volume snacks, but also strength training. And the reason strength training is also important is that loss of muscle strength is a common feature for people with Parkinson's as the disease progresses and particular loss of muscle strength in the proximal leg muscles, the thighs, the quads, hamstrings become important as it may hamper your ability to rise from a chair or to come, you know, too, or to leave your bed or to rise from the floor after a fall. So, strength training in particular the leg muscles is important. We know that and this is a secondary benefit thicker muscles generate more testosterone, and more testosterone helps as an anti-aging component. So, strength training, in addition to everything we said about moving more and moving more intensely is a separate independent component. I do want to emphasize; you need to add it to what we said before. And, just doing strength training is not enough, but it's, it's part of the overall package that you need to do, right?

Melani Dizon:

And strength training is really helps with balance and your ability to catch yourself before you fall. Not only just getting up after you do fall but being able to catch yourself before You fall.

Bas Bloem:

Absolutely. I completely agree.

Melani Dizon:

Right. So, if somebody wanted to start incorporating that, what would on top of the, what we've already talked about 30 minutes a day at least of you know, panting and working out hard and working your heart, what would you add to how much strength training would you recommend?

Bas Bloem:

Yeah, that in all fairness, I don't know. So, what, what I, what I, there's two things that I would like to say is one is find an exercise trainer. Don't do this by yourself. And for example, in the Netherlands, you know, we have the luxury of having our Dutch nationwide Parkinson net, meaning that our country is filled with expert physiotherapists who sit down with you and look at your personal abilities, your personal challenges, for example, rising from a chair and then tailor their strategy accordingly. So, if you consider strength training I would try to find a coach that looks at your current strength levels and your abilities. And the second main advice is with that coach is to build it up. You don't have to be Arnold Schwarzenegger tomorrow, right? But building this up because the last thing you want is an injury. And if you don't lose your strength training, well, you may run into injuries. And as you grow older, and boy do I know from

experience, it takes longer to heal. So, and then an injury is really frustrating, it's frustrating for me while I'm fit. If you've got Parkinson's and an injury keeps you from exercising, that's extra frustrating. So, you can set your targets high. But start small, think big, and act fast.

Melani Dizon:

I like it. And the other thing about strength training is it actually makes your other workouts more comfortable and better. Exactly. You actually improve in the other things. So, there's a lot of great reasons for strength training. Yep. Great.

Bas Bloem:

Absolutely.

Melani Dizon:

So, is there, is there anything else? We're going to be talking to Daniel Corcos about a lot of the research that's happening, but is there anything else that you want to share with our community about exercise? And before we, before we say to sign off?

Bas Bloem:

No, listen carefully to Daniel Corcos. He's a wonderful researcher in the United States. He's the guy that I mentioned is one of the few people who looked at the dosing. Daniel is also doing some really cool research now, beginning to understand how exercise works in the brain. But well, maybe one thing that that's nice to mention is and we haven't discussed that yet, is that there are now two studies, one by Daniel Corcos, and one by my group, to show that exercise not only works as a drug in suppressing the symptoms, but it also appeared to stabilize disease progression. Now, to make the claim that exercise is a disease-modifying intervention goes too far. But my group this year in *Amazon neurology*, which is one of the elite journals in our field, showed that in a big exercise study where people cycled on a home trainer on a stationary bicycle for 30 to 45 minutes three times a week, what we showed that compared to a control group that was merely doing stretching exercises, the brain atrophy, the shrinking of the brain, which is happening in all of us, was stopped. And that the brain in the exercise group started to make new functional connections between the disease, basal ganglia, and the healthy cortex. So, brain plasticity is induced by exercise in elderly folks with Parkinson's. Boy, if that shouldn't stimulate all of you to hop on your bicycle, or jump on your treadmill to start exercising, then I've done something wrong today.

Melani Dizon:

Right. That wasn't just stopping, that was actually improving. That was creating a new neural net.

Bas Bloem:

Exactly. Yeah. It was creating new connections, well not new neurons, but the existing neurons made new connections to other neurons. Hmm. So, I tell people in my clinic, if you are, you know, if you are sitting on the sofa and you're not motivated to exercise, think all those new connections promoted by exercise, right? I mean, that should really motivate people. So that's one thing that I wanted to share with folks. It may well be that exercise helps to slow down disease progression. Out of all the drugs, 30, 40, and 50 drugs are being tested today for their disease-modifying potential. Out of all those interventions, exercise is the closest to delivering the promise of becoming the first disease-modifying treatment. People in my clinic who do best are the people who faithfully exercise. Yeah. The other thing that should encourage people is, and Daniel is one of the world stars in that regard, but we are beginning to understand better and better how and why exercise works.

So, my imaging study is one of various studies in the field, but we're beginning to understand how exercise works as an anti-inflammatory drug. Like to stop the process of inflammation in the brain and how it generates beneficial hormones that have a good effect on the brain. So, exercise has long been a black box. We know what went into 80% cardiac output. We know what came out better health, but now we're beginning to understand the effective components of exercise better. And I'd like to share that with folks because knowing that there is a good scientific rationale behind the treatment should motivate you, even more, to faithfully exercise.

Melani Dizon:

Right? I will go back to this story all the time, but one of our ambassadors who's very active in the Parkinson's community and she's told us that when she came to an in, you know, long, many, many years ago, came to a Davis Vinny Victory Summit event and met these people and learned about exercise and she said, you know, all of her friends are basically immobile or dying and she's thriving. And for everyone else in our community that's like this, this learning about exercise saved them. So, I, you know, I know a lot of times we're preaching to the choir because everybody that that is, you know, a lot of people in our community are already exercising, but a lot of people are new and it's really important that they get that message because it can be the difference between the kind of shutting down and thriving and continuing to live a really long, great life with Parkinson's.

Bas Bloem:

Absolutely. Right. Well, well said.

Melani Dizon:

Thank you so much for talking to me today and I look forward to sharing with everybody.



Bas Bloem:

In closing, I just want to thank the foundation for supporting our work at my center. You've been a faithful fan of the stuff that we're doing. We're doing work research into the benefits of exercise, not just for people who have Parkinson's, but really exciting new work to see if exercise can help to prevent or postpone Parkinson's in those at risk. Your foundation is supporting our work and we're very grateful for that and we're excited that I wish

Melani Dizon:

Launched that.

Bas Bloem:

Absolutely. And I want to wish folks on the other end of the line, all the best. Keep up your good work. And we won't stop until Parkinson's stops.

Melani Dizon:

Excellent. Thank you.

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