Introduction to Exercise and Brain Health

I think the problem is people oversimplify or overestimate the use of exercise, and maybe they're thinking, oh, well, it's just exercise. Everyone should do it.

It's zone two. That's the best type. Go do, right? And that's not true at all because there's different levels of evidence for every different type of exercises.

And not only that, but which intervention is doing what type exercise? So there might be a different prescription for a difference cognitive level. There was a research study that came out, I think it was systematic review, showing that individuals with dementia who exercise got worse.

Well, what was that about? Was it maybe the intensity? Or was it the type? Maybe they were just declining and they didn't track normal decline rates? And maybe compared to a control group, they may have declined slower.

Welcome to this episode of Think Well, Age Well. I'm your host, Dr. Heather Sandison, and today I am delighted to introduce you to Ryan Glatt. Ryan is a certified personal trainer and national board certified health and wellness coach who has spent over a decade specializing in the intersection of movement and brain health.

He's the director of the FitBrain program at Pacific Neuroscience Institute. where he creates personalized, research-based exercise and lifestyle programs to support cognitive health and reduce the risk of decline.

Ryan holds a master's degree in Applied Neuroscience from King's College London and is currently pursuing his PhD in Leadership, Health and Human Performance with a minor in Gerontology at Concordia University of Chicago.

He's also completed additional training with organizations like the Amen Clinics, Brain First Training Institute, and the Academy for Brain Health and Performance.

In addition to his clinical work, Ryan is the creator of the Brain Health Trainer course, distributed by the American Council on Exercise, and he frequently consults with technology companies on innovations like gamified rehabilitation and dual task training.

He's an international speaker, thought leader on brain-body fitness, passionate advocate for the role of exercise in preserving and enhancing cognitive function.

I've personally had a chance to work with Ryan through our collaborations at Pacific Neuroscience Institute, as well as having him teach our FitBrain courses at Murama.

Ryan, I'm so delighted to have you here today. Thanks for having me, Heather. Excited to chat with you. So let's dive into just first your personal story.

How did you end up doing this work? It's super random, very serpentine, as I say. It kind of wasn't something I set out to do from the get-go. Part of my personal story is as a kid, I was born in 1991. And as a kid, I was very overweight.

I had a concussion. Uh, it was addicted to video games, not good at sports, Not great in school. Some of those things are still true. Um, and I sort of really struggled through a lot of my childhood.

And I then got a game called Dance Dance Revolution. Have you heard of this game? Yes. Dancing video game. It was, got it from my PlayStation 2. Got the home version with this foam pad with an arrow on the top and bottom

and left and right.

And basically for those that don't know what it is, it's a music video game where you're stepping on arrows to the beat at certain times and it can get quite difficult.

It doesn't look difficult from a distance and then if you find an arcade with these and you get on it, you are like, wow, this is really hard. So it's a lot of timing, a lots of rhythm, very heavy on cardio, and I lost a lotta weight.

Ryan Glattu2019s Personal Journey into Movement and Cognition

I didn't know that I was experiencing cognitive issues from my concussion, but I improved upon that, started doing better in school, became more social, joined a tennis team.

It really changed my life. And then going through high school I loss my mom to kidney disease. But before she passed away she had a leg amputation with a prosthetic limb.

And part of her physical therapy rehabilitation was using Wii Sports. You remember Wii sports? She was playing the tennis video game on Wii Sport. Her physical therapist was doing that to facilitate a weight transfer to that prosthetic limb.

So these two things really kind of made me think about the role of gaming and cognitive load during exercise and the value that can have. Of course, I didn't put that together at the time, but through watching my mom's experience with physical therapy, i was very inspired to become a physical therapist.

So I went to a Caluthrin University to get my bachelor's in exercise science. Still pretty bad test taker when it comes to standardized tests. So, I didn't have very competitive applications for physical therapy.

I applied outside the country in Scotland, Glasgow Caledonian University. Had an interesting turn of events. I lived in West Africa for a year to volunteer a hospital for, a physical-therapy internship.

Ended up not going to Scotland, came home, became a body worker, something called a structural integrator, which if you've heard of… Rolfing, that's part of structural integration, kind of like massage therapy, but a bit more structured and looking at posture and movement.

Burned out on that very quickly and was kind looking for my next step. Okay. I've done personal training, physical therapy didn't work out, massage, therapy.

Didn't workout. And when I was doing body work with people, I noticed that a lot of the reasons people were not experiencing the way they wanted to experience movement through pain and discomfort or dysfunction or limited range of motion, a lot of it had to do with health behaviors.

They were in repetitive positions, they weren't doing what they were told to, were sleeping well, lot a stress. And so I started to think about, okay, how can I get these people to not have to come see me?

And that's when I really got into health coaching. This is before the National Board of Health and Wellness coaches existed. So I started to kind of piecemeal different behavior change research and education together, and then eventually became a board certified health coach.

And then I was thinking about like, well, how can I really kind stay interested in what I'm doing? Because I keep kind burning out. I need something endlessly interesting to keep my ADHD brain interested.

and I realized, oh my gosh, there's a brain health epidemic. Through my journey with brain health issues and through my family's journey and just like knowing that it's a big problem I wonder if there's way to link like behavior change with exercise science with gaming and that's when I really kind of stumbled into not really found founded upon but stumbled into dual task training.

And it's confusing in the literature, and we'll talk about it. But there's a lot of different words like combined cognitive physical training, like, well, what does that mean?

Combined cognitive, physical, with the cognitive? What's the physical? Long story short, I got these reaction lights called fit lights. I was going to people's homes, working with children on the spectrum, work with people with Parkinson's, just trying to like help people move and think at the same time while also making it fun.

And then I met Dr. David Merrill, who you obviously know well, and he said, I want a brain gym. I'm like, that's awesome. Um, didn't know that was even a possible thing, but that makes a lot of sense that if that WAS what I would be doing with this, That's what i'd like to do next.

Flash forward seven, almost eight years now, I've been at Pacific Neuroscience since then, working with Dr. Merrill, who I'm extremely grateful for, for giving me this opportunity and the incredible team here at PNI.

And we've created the FitBrain program, which is really what I consider the world's first real brain gym. where people can experience these cognitive motor dual task and extra gaming challenges in adjacent to a clinical setting.

And we're doing research and helping other people around the world set up these programs to be more brain health oriented. So it's been a very fun journey and it is really weird, but sort of sensical how I got into it, and very grateful.

I consider myself very lucky. So take us through one of these extra gaming. Someone comes into Pacific Neuroscience Institute and they're working with you.

They've got an hour or so on the schedule. Take us to the logistics. Yeah. Absolutely. Sure. So, before I get into the exact session structure, what I'll say is, I will just define XR gaming and dual tasking.

Perfect. Xr gaming is anything that is a physical movement in the context of a game. Dance Dance Revolution and Nintendo Wii are the most common examples.

People also might remember the Microsoft Kinect camera, which is the camera like this thin, and you're kind of moving your body in order to play games on the Xbox.

That doesn't exist anymore. Microsoft still makes a tracking camera, but it's for military and other research applications. But now there's virtual reality gaming where you can put on a VR headset and play table tennis or do dancing or boxing.

And so anything that is gamified, meaning there are points or competition or an immersion of an experience of some kind, your character, there is a leveling system, good or bad, scores, all of that, is gamefication.

So extra gaming is basically anything interactive that requires your body in order to interact with the game. And often that ends up requiring some kind of calories burned and neuromuscular effort and cardiovascular effort.

So it ends being exercise or physical activity while playing the game. And this has applications for older adults, children, special populations, and now extra gaming is gone from more general extra games, which is like the Nintendo Wii.

Dance Dance Revolution, which have been researched heavily, all the way to now clinical extra gaming, So the Fitbrain program at PNI incorporates some of these technologies.

There's a technology called SmartFit, which is like a big wall that has nine different light-up targets in their LEDs. So they might have numbers, letters, and think of like brain games like BrainHQ or Lumosity, but it's kind of on a bit screen and you're matching two things that are the same, or you are memorizing the position of certain things, finding the letter A while ignoring distracting letters and then coming up with a word that starts with that letter.

So instead of doing it on a little screen where you're maybe typing or maybe touching on an iPad or a tablet, you actually doing on this big, enlarged, like life size, human size.

It's not like a big screen TV. There's these individual circular targets that you have to touch. So you're reaching, you are doing hand-eye coordination.

But yeah, instead of this, which is not bad, that's computerized cognitive training. That's good, it plays a role. It's larger, so you interacting with your body.

And then while you doing that, You might be marching in place. You may be balancing, stepping over a hurdle.

What Exergaming and Dual-Task Training Look Like

So that is an example of cognitive motor dual task. There is one cognitive task, there is physical task and then you typically doing them at the same time.

Then there's something called the Dividot Senso, which kind of looks like a dance dance revolution. It's got an arrow forward, backward, left and right with rails.

And you're stepping right, if there is a red dot on the right. Stepping left, there are red dots on left. and it keeps track of your reaction time in milliseconds.

You're trying to get a high score, it keep track your score. There's memory games and attention games. All types of things you might find in computerized cognitive training.

you would find similar versions in these types devices. So when people come in, they're spending about five to 10 minutes per device or per station. And we kind of go around and I call it a brain circuit.

So it's like circuit training, but it is a Brain Circuit. We are experiencing these different clinical extra games. Sometimes we'll just take a break and we will sit down or we do a low tech dual task, and we might march in place while naming animals.

That's a very low-tech dual-task. And these low, tech or no tech, dual tasks training, that stuff's been around for decades in literature. It's mostly been in traumatic brain injury literature from the military or physical therapy, neurological physical, therapy research and practice.

So it's not new, but the advent of some of these technologies are evolving and becoming more accessible and more specific. And then that in combination with low tech or no tech dual tasking, can create this concept of what I call a brain gym type concept where senior living communities, physical therapy clinics, medical fitness facilities and personal training facilities, places like Murama can incorporate multiple, one or more of these modalities to really kind of get some of the benefits of dual task training and extra gaming, which research has found can improve cognition, specifically executive functions and processing speed, can improved balance and improve other aspects of mood.

So if we're after those things, which I think a lot of us are, extra gaming and dual task training can be a big part of an overall regular program for people.

And what about people who are living at home or people coming into your office? You know, I'm curious how people can access this sort of thing. I am curious about how can people access the sort thing from either from home, wherever they are in the world, Or if they are close enough to your office in Santa Monica, what does it look like to engage in this?

Are they coming daily? Absolutely. Are the coming weekly? Or are they for 12 weeks and then they're done? Kind of like a PT program. Or is this indefinite?

This is just part of who they and part how they exercise. Yeah, people ask me this all the time because I sell this idea to people about extra gaming dual tasking.

Like, wow, it sounds great. How can I get it? I'm like, yes, but also no. And they're like what do you mean also know? Well, one, there's emerging technologies.

So it's not always easy to get access to a clinical extra game. However, there's companies like LudoFit, L-U-D-O, where you can download, it's just a software for a laptop, and if it has a webcam, It'll work, or an iPad, Where you position it in front of you, kind of like those Microsoft Kinect cameras were, but it is on a Laptop or iPad.

And you're shifting weight as you are skiing downhill, playing games where you're using your arms to collect things and you are doing memory games. So that's currently available.

It's like $15 a month, so it's cheaper than BrainHQ. And it is not appropriate for everybody because again, even though it can be played seated or standing, if someone is playing this and they are not tech literate, they might be frustrated.

If they're at a high fall risk, and they're distracted, they could fall and hurt themselves. So it's not appropriate for everybody. I don't recommend this to every single person, so I only recommend it to people that have the tech literacy.

They've proved to me they are going to reduce the likelihood of a fall, maybe they have supervision, or they aren't going call me every day for tech support, that type of stuff.

That's one type option. Another type is a VR headset, which also I recommend to less people, because the fall risk and tech requirements can be a little even higher.

But for some individuals that are more tech literate and willing to do that, there's table tennis and boxing and dancing and they're games, but they are replicating physical activities that have a cognitive demand.

And that's what I really tell people is you don't need any of the specific games. Just because you're matching LED letters on a screen doesn't mean it's superior to say Tai Chi or dance.

which naturalistically have dual task demands embedded in the activity. And there's actually, there a lot of evidence for dual-task training and extra gaming, but there is even more evidence of Tai Chi, for yoga, and for dance.

So I'm often selling people on the idea of dualtasking and then saying you don't need exactly what I am doing because there are activities that are readily accessible to you, in your community, at your home, neuromotor activities such as dance, mind-body exercises like yoga and tai chi, table tennis, if it's appropriate things like pickleball, stuff like that.

There's varying degrees of evidence for all of those but if we think about it, all those things require moving and thinking and there's excellent research to support those being supportive for cognition in a variety of populations.

So I'm often telling people don't over glorify the dual task training and extra gaming There's more technologies coming out to make it more accessible because people want this type of training.

They like it. It's not the same as what I've described, but it is hitting on kind of that same thing of moving and thinking they like that idea. And there is research to support it, But again, I think more sustainable behaviors preventing the over glorification of specific interventions is very important to Make this practical for people.

So people see me once a week. But I always say if it's a dual task training, extra gaming or neuro motor exercise, And a neuromotor exercise should be repeated about two to three times a week.

But dual task training or extra gaming can just be one of that. It could also be a yoga class, it could be Tai Chi

class. it can be dance class all of thats great too.

And then when we're talking about these dual task exercises, there's a spectrum of this, right? And you, I think you've even said to me in the past, like walking and talking is kind of the most accessible, simplest way to do this.

And we've got the high-tech interventions that you're describing. I think these high-tech interventions make a lot of sense for someone who's socially isolated, right?

Where it's challenging to get to the why. Maybe they live in a rural community, maybe they don't have a driver's license anymore. This is a way to connect them with exercise in relatively safe, although better to be supervised kind of way, but to also find that motivation when there's not intrinsic motivation to go out and go for a walk.

or maybe it's snowing, maybe they're in like rural Canada, right? And it is not feasible to get out in the winter time. This is a way to kind of bridge that gap between seasons and get some physical exercise going.

But I think your point also well taken is that this could just be going for a walk and talking to someone or what about listening to something? Yeah, so this is a great question and I agree with accessibility and equitability.

Some of this expensive equipment, they're out of pocket services. They don't make sense for most people. The clinical extra gaming belongs in a clinical setting because they are more expensive pieces of equipment.

and they're very targeted and should be supervised. However, these more general but yet specific extra games like the Nintendo Wii wasn't developed for older adults, but there was massive adoption with older adult.

There's still bowling leagues in Texas with hundreds of older-adults playing Wii bowling in a competitive format. So like, the Wii was one of those things that really helped spark this adoption of extra-games and things like LudoFit and P and I have developed these games that we actually piloted with Murama where we can deliver it over Zoom.

We've partnered with companies like Age Bold and other trainers to record dual task training classes and both seated and standing position. So more and more accessibility is getting out there.

I'm very passionate about that. But to your point, like how can someone who is in a setting where they can't really go somewhere access this? I think technology is a great way to deliver telehealth, recorded online videos, software, stuff like that.

And I think also then you're asking about like, well, if someone even can't access that, because that's also very niche, they have to hear about it, They need to find it.

They needs to sign up for it maybe pay for. That's not likely. So how could someone who is not, let's just assume they're not going to participate in any dual task training or extra gaming at all, which is totally fine.

How can they get some dual tasks training? So again, that there's dual task demands and dual tasks training, and they are not the same. So if I am walking and talking with somebody, that is demanding dual-tasking of me, but it's not necessarily dual test training.

Accessing Brain-Health Exercise at Home and in Clinics

Dual task training is kind of like the difference between, yes, lifting a bag of groceries to the shelf requires resistance or overcoming resistance, but it's not resistance training.

What are the difference between those two things? Well, resistance trainer would be a structured amount of time that I set towards doing that thing repetitively.

Whereas the lifting the bag of grocery was the real world demand that hopefully can do with ease. And maybe the training helps me prepare for the real world demand.

Dual task is very similar. There's plenty of dual task demands in our everyday life. And I think there's both a cognitive and a physical rationale to prepare real-world dual-tasking.

So a lot of people fall when they are distracted. when they are distracted and I hear these stories all the time. It's not that the person had significant cognitive impairment, it's that that person was distracted.

I've tripped and fallen when I'm distracted, I am sure everyone has had that experience or carrying the cup of coffee and then it is open or it spills while you're walking.

That's a motor motor dual task failure. This is task motor task A, walking is motor tasks B. And then you spill the hot coffee in your hand and maybe cuss words leave your mouth and it's very upsetting experience and you stain your pants you just got.

Whatever that is, right? So that's dual tasks failure in real life. That can happen to anyone of any age. Then there's texting while walking, my favorite.

You see this all the time. Why do people not like this? Because they're distracted and they see their walking performance change. They have kind of these wavering walking patterns where you then have that awkward moment where someone you're walking towards someone, they are walking toward you while they were texting and then you are trying to avoid each other and you like oops sorry oops, sorry and that's frustrating.

That's a dual task. cost where that person who's texting is losing their attentional resources towards the walking and navigational task. This is why taxi while driving is a very bad idea because it requires that split of attention resources.

So I can come up with tons of different dual task examples in real world, even talking with your mouth open, which is sometimes considered rude, but sometimes consider normal is also a dual tasks.

It just so happens. Chewing with your mouth open while talking. Oh, yeah. Chew and talking at the same time. Which I have misophonia. I hate that sound, but a lot of people do that.

It's fine. But that's a dual task demand. And so individuals with Parkinson's disease or mild codmin impairment or certain types of dementia have issues with dual-tasking.

This is where it becomes more of a serious health issue or risk, where if someone's trying to talk with their mouth with chewing or swallow while listening and they start choking and have swallowing issues, that's a problem.

If a person is walking while talking and then they have a risk of falls, That's problem and it can go on and on, right? Even carrying a bag of groceries while walking is technically a motor motor dual task.

So there's cognitive motor dual task, motor motor, dual tasks, or cognitive, motormotor dualtask, which is my favorite, where I'm on the phone walking while carrying a cup of coffee while texting.

That's my favourite. So, there are all these real world dual-tasks demand that are placed upon us. And yes, slowly exposing ourselves to those safely might help us improve in those, but they're not the equivalent effects of dual test training.

issue. And also it's kind of like physical activity versus exercise. Both are good, but they're not equivalent. It's good that you do house chores, right?

And it is good you're moving, it isn't exercise, and it has benefits, you can't just do a walk and say it moderate to greater or greater intensity physical activities, they are both good.

So it's similar in that way. So walking and talking can be a form of dual-task training, but is usually representative of just a real-world dual task demand.

I'm sorry, that was a longer answer for a very short question. No, it makes a lot of sense because I think, you know, often in my clinical practice working with people who have dementia, they come in and they're really proud to say, I walk the dog every day.

How many? I walked the dogs twice a day, for 20 minutes or 30 minutes. And then, you know, they've got a little dog and it stops to pee and maybe it's older.

Although it is good they're getting some movement, it isn't enough, especially if our goal is to reverse cognitive impairment associated with aging. So we've gotta do more.

I hear what you're saying. Yeah, that's a demand, but that is a day-to-day demand that you should be able to keep up with. It's not the training. Right.

Getting up from a chair or getting off a toilet is real-world activity we should do with ease. If we're struggling with that, we can do training that targets that function, and then practicing that can make us better at that.

Sometimes I might have people walking while naming animals. And yes, they could do that on their own, although pressuring them to do it at a certain intensity cognitively might put them at fall risk, which is why supervision is important.

But I have heard from people, especially those with certain conditions like MS or PD or MCI, that when they listen to a podcast while they walk, or when they are talking to people while they walk, they do feel this dual task demand and they can improve their strategy of how they allocate their attention, which then makes them more efficient at the real world dual-task demand.

So it's not that it doesn't have a place, but it is not the equivalent of the training, if that makes sense. Yeah, and then how, you know, dual task training is something I talk to a lot of people about thanks to you.

And often the question is, well, how do I fit this into what I'm already doing? I am going for a run, or I m going a brisk walk, I s walking the dog, going to strength training, have a personal trainer, a PT and I got my PT exercises that I do three to four times a week.

And then where do I put in dual tasks? So just talk me through, like, how does this fit or balance exercises? Maybe I have balance exercise from PT. There are different types of exercise.

And do we do it all? Do we combine them? Like, what's the best way to do this? Yeah, it's confusing because I mean, from the perspective of the patient, the client, a person, and even us, we hear all these recommendations and we're trying to be healthy, good people and do all of these recommendation.

But when you hear that you should be doing three types of exercise three times a week and you realize that's nine days a and there's only seven days, that doesn't really make a lot of sense.

We want to glean the benefits, and we don't want have brain health FOMO of missing out on all these potentially great things. So at the same time, this is where I'm like, OK, number one, don' worry about it.

Let's back up. let's just see what the point of dual tasking and extra gaming is. Yes, in the context of something like neurological physical therapy, you might have a specific goal there where dual task training is a technique used to improve the allocation of resources between motor and cognitive.

But let's just say if we're doing it for overall cognitive well-being or to improved cognition in any way, shape, or form, I think one of the things that I like about dual-task training in Extra Game and what they represent is they just increase the average cognitive load of our day-to-day activities.

So I think that's the real question is like, okay, in that example, how could we increase the cognitive load of any of those things? And how can we hit, I don't believe in hitting birds or killing birds, but how we can hit as many birds

with as little stones as possible, meaning, How can you save you time, money, effort and worry?

So this is where I say, Okay, well, In that physical therapy exercise list, when's is the last time it was updated? Usually it's like a black and white piece of paper from 1986 or whatever and like it has been the same thing forever.

How Dual-Task Training Fits into a Weekly Routine

And that's fine. That's good. Anything is better than nothing. But what about adding variety? What about updating those? what About making those more challenging?

Or let's say someone's doing resistance training. Are they doing things in the gym where they've been doing the Same things for a while? Could those movements be more cognitively demanding?

Could they work with a trainer to do more complex movement patterns where it's almost like dance choreography where It's a step with the curl and a press and then a single leg balance which has more steps than sitting down and just doing this on a machine which is not bad which Is a lot of what I do for more resistance training closed chain you can get more weight closely followed variables of tempo, all that's important.

But how could we increase the cognitive load, not just the intensity, because a lot of people with exercise are just talking about aerobic intensity or, you know, zone to train or the certain tempo in your weight and be doing more weightlifting.

That's true. And that powerful and that good. But also, what about the cognitive load? If cognition is the goal, then we should be specific about having cognitive demands.

And there's something in exercise science called the SED principle, S-A-I-D, Specific Adaptation on Imposed Demand. So if we're imposing the demand of something cognitively demanding, we'll probably adapt to overcome that task, and sometimes that manifests as improved or sustained cognition.

And so if that's true, what are more activities that could overall improve that average cognitive demand throughout the whole context of the week, not the single session or technique?

Because when we look at a dose response, that is going to be more powerful than the perfect dual task technique that any eye could give somebody. It won't matter in the context a program that has an overall low cognitive load.

Because then you have a hot spot of 20 minutes once in a week where they have lot of cognitive demands, but that doesn't scale throughout a So that's kind of what I'm thinking is like, okay, well, in that example, could they have more variety, more novelty?

They might have been playing one sport, but can they play a different sport? Or can we play against a harder opponent? or they might be taking a dance class like Zumba where they're following along with the instructor, which is awesome for processing speed and attention.

But if their goal was memory, could they enroll into dance class where they have to learn and memorize choreography? So that's the way I think about it is like, how can we take the specific cognitive weaknesses and prescribe or encourage people to partake in activities that train those?

It's kind of like the approach of computerized cognitive training, where you're addressing the weaknesses, but you are doing it through the lens of physical activity.

So I know you don't like to be penned down, but I want to give you a scenario. Go ahead. A 76-year-old woman. I like scenarios. Okay, great. So, I've got a 76 year old patient.

She is struggling with MCI. Her mocha is around at 18, 19, and she's been there for the past six months or so. she is pretty steady, she on the right diet, She's walking the dog a couple times a day, And she goes to a yoga class

once a week.

And she is taking the supplements. She's doing most of the Bredesen protocol, but she's not improving. And we think that it's probably exercise. she has been an avid exerciser most her life, But she isn't really pushing it these days.

So can you help me design a weekly program for her? What does that look like? Totally. Which may be modified based on more information that I gather, such as orthopedic issues, experiences, accessibility, budget, all these things, preferences.

Or yes, I'll give you a blanket sort of thing that we could customize further based upon those variables. So the first thing is, okay, how many total things is she doing?

So there was the yoga once a week, right? She's going to one class a week and then she's walking the dog twice a day, but it's a little dog and it stops to pee a lot.

So in terms of structured exercise, not that I don't count physical activity, I do. But for the purpose of this, creating like a brain healthy exercise program, she is doing one yoga class week.

Yes. Okay. That's great because the fact that she doing something once a weak means something. Is she do this online, in person? She goes in person on Saturday mornings with her girlfriends.

Oh. So it's a social activity. Yes. It might be more of a a physical activity than a That's okay. It sounds like this person's externally accountable and that I'm wondering what more social accountability options are available to this.

Because if we told this, you're not doing enough. You need to do more. But it's on her own. She may not, especially if she's an 18 out of 30. And this is the thing I hear is like, oh, I told them to exercise, but they don't.

Well, number one, it is hard to get people with normal cognition to. So let's think about this. It's on top of the executive functioning challenges, the forgetfulness, You know, it sounds like there's already a lot of success with one strategy.

I would double down on that strategy, so that I'd say- So maybe you can go again multiple times a week. Exactly, and it's very interesting. There was a large umbrella review of meta-analyses on the effects of which types of exercise yield the greatest cognitive benefit.

And after this, in children, midlife, adults, older adults and I think some adults with cognitive impairment, the total pooled number of subjects was almost uh, 200,000, I believe.

And the two types of exercise that were found to have the most, um, uh I think the highest cognitive benefits were exer-gaming and yoga. and that might be for several reasons.

It could be the study designs, it could the effect sizes and the, that we're reporting. Could be a lot of different things. I'm not saying those are superior to everything.

Just thought it was interesting. So she might on the right track here. Let's get her to a second or even third yoga class. And I would imagine that that increased dosage, because I always talk about exercise dosages.

If exercise is medicine, we might need to tweak the dosaging to get a better response. And so she is taking 50% of the recommended dosing for this medication that's exercise.

So let's get her to 100% and maybe even 150%. Then let see if we can diversify, cause it sounds like if she's going, I'm sorry, you were saying something.

Oh, I'm just wondering if there's like a minutes per week. I typically say 200 minutes a week as the goal. Now, from the Framingham study, you hear anything from 150 to 300 minutes from other studies as well.

How do you help people narrow in on a number of minutes? Or is it kind of like, OK, she's going to this one hour a-week exercise class. She's at 60 minutes.

Let's just get her to 120. Don't worry about the 200 yet. Like, let's bump it up and increase the dose. I do see it as a stair step because when I tell people that they need to reach this goal and they're at this school, they can feel overwhelmed and significant, unsuccessful, frustrated.

And also, I haven't met a single person that measures anything in minutes per week. Have you? Well, you know, it's helpful for maybe it is for me, but classes that are 60 minutes and 50 minute, like 50-minute classes, You can say, okay, if I need 200 minutes, that means four classes a week.

And so I'm going to the gym for 30 minutes. You're right on the nose. So that's how I think about it too. I am calculating the minutes in my head. They don't think of it in minutes per week, Right.

So I'm like, you need 26 more minutes here. I do it in days per week because that's how people book their calendar. Oh, yeah. Nice. Okay. You're doing yoga on Saturdays, right?

You said it was Saturday? Uh-huh. Where's the class schedule for this gym or community center? Let's look at the entire class' schedule. Let sit down together and let's not worry about commitment.

let just circle the classes and times that you would like to try. Let's look at this like a restaurant menu and let's try things on the menu. If you don't like it.

Don't you, don' have to get it again. Or sometimes you could just say, Oh, the kitchen didn't make it well. One other person liked it, let' try it agai or try a different restaurant.

That's how I look. I'm like, Let' go shopping for experiences and Let''s sample a bunch of things. And most of the time. they end up sticking with what they try.

Oh, nice. Most of the time. So I just kind of sneak it in there. I'm like, let's just try it. No pressure, no pressure. You don't have to do this for the rest of your life.

They do. But we just want to actually figure out what the like because there's this apprehensiveness and overwhelm and like feelings around certain types of activities.

they may not feel confident, they might not good, They might be struggling with the scheduling aspect and that's too much executive functioning demand for them.

So I would say, I will do that with this individual, maybe a caregiver, or maybe family member that can help create a calendar to help keep her accountable.

That way we can more automate this and we don't need to coach as much as we need structure and schedule. And you know the power of routine. Everyone knows the Power of Routine.

especially for that population, someone at that cognitive level, routine is very powerful. And for the first two to four weeks, it's going to be a little rough maybe at times.

We might have activity refusal, we might times of day, and we may have medical changes and whatever.

Designing a Brain-Healthy Program for MCI

But we just got to work past that. Yeah, this working through that, if we're recording this in the end of September in

2025, I still have people who show up who say, Oh, yes, I go to yoga all the time.

Well, until COVID. And then my instructor, you know, then the yoga studio shut down, and I haven't really been back since. But their identity is that they still go yoga, right?

But it's been five, six years. The other thing that happens is, oh, the instructor had a baby, so she's out, And I don't like the new person. Or I had an injury.

I stubbed my toe and i'm waiting for that to heal. or I sprained my ankle and so I'm going to PT and waiting that heal There are these things that throw us off and they're all very reasonable, right?

And they seem small too. They seem smaller, but then all of a sudden it's been 18 months and we haven't gotten any exercise. And so they might still think they are going every week too if they have memories.

Yes, there's this identity. Oh, I ride my bike. When was the last time you rode your bike? Oh before I just sprained my ankle in 2018. Wait, what? And I think that there's this disconnect between reality, but it's also the struggle of getting back on the horse, this effort that it takes to get back into it.

Do you have any tips or tricks about how to kind of recommit to a movement practice? Every person's different for this. Everyone has their own personality, their resources, and their support.

So there is no one thing that will work for everybody. But yes, I have that experience where the person who has impairment is sitting in front of me, then the daughter, son, or caregiver behind me is like, they're not doing that.

I know they are not actually doing it. If they have this positive health identity, let's capitalize on it. So I say, oh, great. Would you be open to having a trainer just look at your form, make sure it's good?

Oh, sure. And before you know it, that trainer is coming every week. Oh I'm glad that you have been going every weak since 2005. They haven't. Could I come with you to your next appointment?

Where is it? When is? It's on your calendar? Great. I actually don't show up. But you can actually use therapy. Yeah, we can use therapeutic fibbing. We can say, oh, you say that you're going, but then in reality, they're refusing to go.

Instead of trying to push that, maybe we could just bring it to them through a video or through like a trainer or an instructor. Or maybe it's because of the time of day.

Maybe it is because they are tired or medication side effect or it has not had it yet. or maybe you need to bring them with you and say it for you, not for them.

Right. Because in their health, they don't need it. They're already doing it, so why would they need to do it? Right? So there's various strategies, and it's going to be different for everybody.

But a lot of it is called behavioral reactivation. I need re-activate that behavior. And the way I can do that, there are multiple strategies. It's usually just that starting initiation.

A lot people don' t know that initiation and planning are executive functions. If they have impairment, again, people with no impairment struggle with this already, So they just might need help re-initiating and re planning and scheduling.

So a lot of it's scheduling because most people will not miss an appointment Most people are not they're externally accountable They don't want to miss and appointment and if that appointments either they made it or they didn't make it that Appointments on their schedule.

It's time to go It time go to that that appointment And most of the time they'll end up doing of course, that's easier

said than done. Everyone's different.

There's personality changes personality considerations transport, logistics, all sorts of stuff. But that's one approach I would take. So we have to keep that in mind as we're trying to create a program that hits at least 150 minutes of moderate intensity for greater.

And the yoga or Tai Chi or any of that would check off the neural motor in the mind body, but then we might need some aerobic demand, and then, we may need resistance training.

Ideally, they're doing this five times a week for at 30 minutes. That's five time 30 is 150. But it could also be anywhere between three and seven days a week.

So it's quite broad what this program could look like, and it can be between 20 and 60 minutes per session. It could include a trainer, it include in a gym or community setting, a YMCA, online programming, physical therapy.

The challenge is figuring out what it looks like for each individual person, kind of like a diet. Right, and it doesn't work if you don't do it, right?

So it's better to get it done than to do perfectly. There is no perfect. I don't believe in perfect, I just believe and getting closer to the goal which is enough, enough.

We think that 150 is a enough but then there's conflicting evidence on intensity and for who. So it depends on their cognitive level, it depend on the biomarkers, their psychology, the affordances.

This is where the personalized precision medicine comes into play and if we treat exercise as part of that precision medicine strategy with the same philosophy and approach, then we know that's why we can't blanket nutrition or supplement regimen for everyone either.

And I think it's very similar with exercise. I the use of exercise, and maybe they're thinking, oh, well, it's just exercise. Everyone should do it. It's Just Zone 2. That's the best type.

Go do It, right? And that's not true at all, because there's different levels of evidence for every different type of exercises. And not only that, but which intervention is doing what type exercise?

So there might be a different prescription for a difference cognitive level. There was a research study that came out, I think it was the systematic review showing that individuals with dementia who exercise got worse.

Well, what was that about? Was it maybe the intensity? was it may be the type? Or was maybe that they were just declining and they didn't track normal decline rates?

And maybe compared to a control group, they may have declined slower. Or we've talked about a patient you had who was an over-exerciser. I just found another study showing too much exercise is deleterious to cognition.

It can worsen cognition. So too much would be defined as more than like 500 minutes a week. Or if you're doing an Ironman several times a year. Right.

I remember the patient you had was cycling for hours and they were getting worse. And I'm like, that might be it too. Like that sounds good, but maybe it's too and just like with any medication, too, much is bad.

A brain scan, and we're seeing, okay, this person has smaller hippocampal volume or their hippo campus is preserved, but their frontal lobe needs help.

Whether that's based on an MRI or based behaviorally from neuropsych testing, or maybe they have Parkinson's and their basal ganglia is affected. Maybe their cerebellar volume is effected.

The types of exercise we pick around that can be specific. So more aerobic exercise might be more supportive of that hippocampus or temporal lobe. More resistance training and neuromotor training might support that frontal lobes.

Neuromoter exercise may support the basal ganglia cerebellum better. And that could be functionally, structurally, behaviorally. It really depends. But that's where I think exercise is going.

Is it has a role in precision brain health medicine and we just need to treat it as such. Yeah, I think that was maybe the answer to my next question is, what are you most excited about?

You're doing a PhD program and the research around exergaming, exercise for brain health, What are the things that you see in the future that we're going to discover and learn and understand about this?

What is most exciting to learn? Yeah, I think extra gaming and dual tasking, the reason I've committed so much of my career to it is because I thinks it's awesome and it another modality that I can help people that just isn't as available as say a dance class.

But I don't think it superior to anything. I just think that access is limited. So my work is really focused around creating access. So, this is what we've done with the FitBrain and Brain Gym concept.

Now, the Santa Monica YMCA, about four or five different senior living communities all have the same program that we do. How exciting. Very much the the equipment, same training, So I want to continue to work on that, speaking at conferences, getting people to think about this.

Precision Exercise Prescription and Future Research

And you don't have to buy a lot of expensive equipment to do this, there's a low tech version, a no tech, version a mid tech and a high tech versions.

There's the home version. there is the Home Physical Therapy version there are all sorts of different versions of okay, this represents an integration greater cognitive demand and also more fun into the exercise programs that we're delivering, right?

The other thing is just getting people to recommend and prescribe exercise and coach exercise in a better way. I don't even care if that includes dual task training or not.

And I prefer it doesn't because it tends to complicate things. So I just say getting closer to that, checking off of the aerobic resistance and neural motor activities.

of at least 150 minutes is the work we all have to do from where we stand, whether it's clinicians, coaches, trainers, therapists, nutritionists, anyone needs to help get people closer to that.

Cause I just often find that people have put a lot of thought into their diet, which is awesome, but they haven't put equivalent thought to their exercise program.

And I would like more mind share and time spent on that type of activity and getting people up to stuff. Because I think it would be more supportive of their cognitive goals.

dementia prevention goals and any other brain health related goals they have. Furthermore, I would like to see people just incorporate better behavior change strategies for all of this.

Something I've talked with Dr. Bredesen and you and Dr Merrill about is like, people are overwhelmed. how can we help them be less overwhelmed? How can actually break this down and make it more like a person managing a financial portfolio where I'm gonna invest your time and effort and money into things that are guaranteed or most likely to give you the biggest return and help parse that out and if you're interested in you know, new and

interesting things and cutting edge things, and so am I, let's pay attention to those, but maybe not as much attention as things that are those foundational elements of treating sleep apnea and basic nutritional adherence and supplement adherents and if that's appropriate and applicable and exercise and cognitive training, because I just have so much experience meeting with people and finding out these really important things are missing and they're not doing them.

So if the goal is to slow cognitive decline, I think, well, let's make sure we've checked off all our boxes. And this population has a tendency to be overwhelmed, distracted.

They are not the ones to invest their time and money into the right things. We have to guide them for that. And just because we talked about it doesn't mean it's done, right?

Just because, we mentioned it to them doesn' mean they'll implement it. That's often far from the truth and they need a lot of follow up to make sure that they're adhering to those things.

So those are, I'm excited about multiple things, increasing access and education for extra gaming tool tasking, behavior change in general, and exercise prescription for brain health.

Those are the kind of the three things I most excited. So this is really compelling information, really exciting stuff that you are doing. How can people find out more about either working directly with you or find the places where there are these BrainFit gyms?

How could people get access now? Where do we want to direct them? Well, again, if people want access to one of the most effective things for brain health, it's called exercise.

And I think the thing that I'm often telling people to do is don't worry about me. Don't worried about the cool technology. It's all shiny stuff. If it has purpose, benefit, and value, don' worry.

Because if you're interested in that, you are probably not hitting that 150 minutes of exercise, which has way more research for improving cognition and brainhealth than what I am talking about.

So at least hit that 150 minutes a week of moderate intensity exercise or greater. If you're not doing resistance training twice a weak, make sure you are doing that.

if you aren't doing aerobic exercise, atleast 150mins, do more of that, if your not do neuromotor exercise. Do more. One way you can accomplish more neuro motor exercise is through a skill based activity like a racket sport, like dance, martial art or mind body exercise like yoga, tai chi or qigong.

through me or through anyone else, dual task training and extra gaming can be one way, just one of the ways to check off that neuromotor category is not the only one.

So whatever makes the most sense for one individual is what makes most for an individual. Let's not force anything, let's glorify anything to make life even harder.

The research shows that Tai Chi or yoga or dance or aerobic exercise, resistance training, all of that has great value and evidence for improving brain health and staving off cognitive decline.

And that stuff is what we should be pursuing. So we shouldn't be really pursuing a multimodal exercise program or a multi-component brain-health program.

That's the one thing that people who already see me keep hearing me say again and again, and sometimes they say, well, I think you actually haven't reached that.

Let me refer you to a personal trainer. let's take a break from dual-task training because this is all you're doing. It's just not enough. Let's get you more of that resistance training.

So it's really about investing in the different modalities and having enough representation of to get the most benefit. Because there's just like blueberries by themselves will not reverse dementia.

We need the buffet effect of enough healthy things in order to make a change or increase the likelihood we make change. And that's also true for exercise.

Ryan, thank you so much for sharing your experience, your expertise, and your passion for this connection between movement and brain health. I just love how you've shown us that exercise is not just about fitness, it's about keeping our minds sharp and being resilient and adaptable as we age and that there are really accessible ways to put this into action.

For listeners who want to learn more, you can explore Ryan's work through the FitBank Brain Program at the Pacific Neuroscience Institute and the Brain Health Trainer Course and his many speaking engagements.

So please look for him online. I know that he's getting more and more of this out into the world, and we're so grateful for it. As always, thank you, our dear listeners, for tuning in to the Think Well, Age Well podcast.

If you have found this conversation with Ryan helpful today, please be sure to share it with a friend or loved one who might benefit, and don't forget to subscribe so that you don' miss out on future episodes.

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