

## “Keeping Fit During COVID-19” with Wendy Suzuki

### Transcript of Communicating Brain Science Podcast



**Guest: Wendy A. Suzuki, Ph.D.,** is a professor of neural science and psychology in the Center for Neural Science at New York University. She received her undergraduate degree in physiology and human anatomy at the University of California, Berkeley in 1987, studying with Marion C. Diamond, a leader in the field of brain plasticity. She went on to earn her Ph.D. in neuroscience from U.C. San Diego in 1993 and completed a post-doctoral fellowship at the National Institutes of Health before accepting her faculty position at New York University in 1998. Her major research interest continues to be brain plasticity. She is best known for her extensive work studying areas in the brain critical for our ability to form and retain new long-term memories. More recently her work has focused on understanding how aerobic exercise can be used to improve learning, memory and higher cognitive abilities in humans.

**Host: Bill Glovin** serves as editor of *Cerebrum* and as executive editor of the Dana Foundation. He was formerly senior editor of *Rutgers Magazine*, managing editor of *New Jersey Success*, editor of *New Jersey Business* magazine, and a staff writer at *The Record* newspaper in Hackensack, NJ. Glovin has won 20 writing awards from the Society of Professional Journalists of New Jersey and the Council for Advancement and Support of Education. He has a B.A. in Journalism from George Washington University.

Bill Glovin: Hi, and welcome to the Communicating Brain Science Podcast. I'm Dana Foundation executive editor, Bill Glovin, and today, we are focusing on ways to keep your brain and body healthy during this time of coronavirus and time of social isolation itself, quarantine. On the phone to offer guidance is Dr. Wendy Suzuki, a professor of neuroscience and psychology in the Center for Neural Science at New York University. Why a college professor to offer advice on this subject, you ask? Well, Dr. Suzuki's work is focused on understanding how aerobic exercise can be used to improve learning, memory, and higher cognitive abilities in humans. Dr. Suzuki's Ted Talk on the brain-changing benefits of exercise was among the top five Ted Talks of 2018. You can find it easily through Google and I highly recommend it. She is the author of the book, *Healthy Brain, Happy Life*, which was published by Harper Collins in May of 2015 and which was made into a special by PBS.

- Bill Glovin: Wendy, on your Ted Talk, you started out by saying that exercise is the most transformative thing we can do for our brain. Can you tell our audience why that is?
- Wendy Suzuki: Well, I think it's even more transformative in our times that we're living in right now because there's such a heightened sense of anxiety, stress, depression, worry, and more than any other time, we need to be able to think clearly. And so, exercise becomes absolutely transformative for our brains because even a single exercise session can improve your mood, decrease anxiety and depression, and increase moods like energy and positive affect, and improve your ability to focus and shift your attention so you can pay attention to all these reports coming out on what's happening in your community. So, for those two reasons, in this COVID-19 crisis, I think exercise is even more transformative for our brains.
- Bill Glovin: Well, this coronavirus and the social isolation that most of us are experiencing is unique. I, for one, had a routine that involved going to a gym several times a week, but now that's not an option. I found it difficult beyond going for long walks and an occasional bike ride to get as much exercise as I was getting before. What am I doing wrong?
- Wendy Suzuki: I'm so glad you asked that question, because I'm here to tell you that you have every single thing, you and everybody else out there, has everything you need in your home to get a good aerobic workout. And they may have different names than you're used to, but it still gives you a good workout. So, you need to stay inside, walk around the perimeter of your apartment or house. And it turns out that all these activities that we typically try and avoid, like sweeping and mopping and vacuuming and dusting, and I just dusted all my blinds the other day and it was a good workout. And then, if you miss the gym atmosphere, I have been a long-time proponent of online workouts. They're getting better and better. The instructors are amazing. There's a huge wide variety, and that variety has exploded even more because people like the dancer, Debbie Allen, is giving free dance lessons. All these. Liam Hemsworth is giving free access to his curated exercise routine.
- And these are routines that you can do in your home with your own body weight, or with an improvised can of tomatoes or bottle of wine as a light weight. So, there's lots of things to do. In fact, I have this square gloves that I do all my workouts on. Kids and pets are a great source of movement around your house. So, instead of trying to think of things that your kids can do, play with them. Play tag with them. You and they can get a great workout. And of course, dogs need to be outside, so hopefully

everyone has backyards, but that's a great source of workouts as well. So, it really is all around you. You just have to kind of look at your home surroundings with new eyes.

**Bill Glovin:** My daughter, she's lucky enough to have a Peloton bike and she raves about their apps for biking and other types of exercises. And I know you just mentioned a few places, but are there any free apps or videos or a place that you can actually find a list of them that you might recommend?

**Wendy Suzuki:** I have been seeing on all the different fun sites that I subscribe to, list free workout apps. I would say the best thing to do is just go to YouTube and Google the kind of workout that you might like. There's lots of free dance workouts. If you want app workouts, Peloton is fantastic. It's a great cardio workout that I can tell you from the workout that I'm doing. Anything that makes you jump, oh my goodness, it really raises your heart rate and there are some great just body movement workouts out there. So, go to YouTube.

Oh, I want to make sure that I include our senior citizens in our conversation, and I do here have a specific website to recommend. It is NIH's [go4life.com](http://go4life.com). G-O, the number four, the word life, L-I-F-E dot com. It is full of free work videos, workouts appropriate for older senior citizens. And so, you can go there and get lots of free workouts there but YouTube and the Internet is full and growing with great fun workouts, sometimes by celebrities or really amazing instructors.

**Bill Glovin:** You kind of beat me to the punch with that answer, because I was going to ask you about relating to various age groups and you mentioned seniors. But is there stuff that kids should be doing versus something an adult might be trying? Or should seniors be limiting themselves to certain things?

**Wendy Suzuki:** I have been talking so much about this as an advisor to Maplewood Senior Living, and as an advisor, scientific advisor, for Seth and Lauren Rogen's Hilarity for Charity. They're all concerned with Alzheimer's disease and addressing cognitive decline. And the thing is that you want to stay in your physical limits, but there's something that anybody can do it, at any physical limit. If you can't walk very well, then simply, you can point and flex your toes for lower body workouts. You can throw some age-appropriate punches, like I give people the image of an octogenarian rocking to move your arm. Whatever body part works best, use that body part. And yes, absolutely, seniors should be focused on staying in their

comfort zone. And that's why websites like go4life.com, they've done the work for you. They're giving you the chair yoga and the gentle stretching that will still get you moving but will be appropriate for your age. And I'll just add that light dusting, there's lots of housework that gets you moving as well in your house.

Kids and adults, great to find ways to get your heart rate up. And in my book, *Healthy Brain, Happy Life*, the book is filled with what I call brain hacks, which are really fun ways to get movement or creativity or meditation in your life in a very easy kind of snackable form. And some of my favorite recommendations are pillow fights. Pillow fights for adults and kids are a great aerobic activity. They get everybody going and a lot of fun. The other brain hack that I love is hula hooping. You may not have a hula hoop, I don't know if there's any more hula hoops on Amazon.com, but that's also a fun way to get moving.

And my favorite one that I use all the time myself is, inspire yourself with music. So, kids have that great video game that includes dances that you do and they can do those dances, while all of us have our favorite music that always makes us feel like getting up and dance. Put that music on, get up and dance like nobody's watching, in your living room. That is a great way. If you have a partner there, dance together. Dance is a really fun, wonderful way to get a little bit of sweat going and get that heart rate up. That's going to get the immediate benefits, those two benefits that I talked about, that is, mood boost because you're stimulating the release of dopamine and serotonin with every fitness session. And two, you are stimulating the functions of the prefrontal cortex that will improve your focus and attention. So, this is part of the reason why exercise is so useful. You get these immediate boosts of mood and focus.

**Bill Glovin:** I noticed from watching some of your videos online that you mentioned how exercise relates to the hippocampus, which is the part of the brain tied to memory. Can you talk a little bit about that?

**Wendy Suzuki:** Absolutely. Absolutely. So, that goes back to one of the three major transformative effects of exercise. The hippocampus is benefited by long-term exercise. You're not going to get an immediate memory boost with every workout. But here's what every workout is doing. It is literally kind of bathing your brain in what I like to call a bubble bath of positive neurochemicals. And one of those neurochemicals is called the growth factor. That growth factor, in the long-term, if you keep that growth factor up with your exercise, stimulates the birth of brand new brain cells in the T-structure that you mentioned, building the hippocampus.

Hippocampus is critical for long-term memory, also very susceptible to aging. And one of the most valuable and motivating and deepening effects of exercise is that it literally stimulates the birth of these new hippocampal brain cells. Your hippocampus gets bigger, it gets fluffier, it gets fatter, it works better.

So, your memory will work better. And if you kind of extend that out for longer periods of time, because we know the hippocampus is very susceptible to aging and soon after starts to die with aging, the bigger and fatter and better-functioning the hippocampus is, with exercise, the longer it's going to take normal aging to have any effect on your memory. So, I'll tell you, this is my number one motivation, why I get up every morning and do my workouts, because I want the biggest, fattest, fluffiest hippocampus that I could have.

**Bill Glovin:** One of my colleagues wanted to know about focusing on cardio versus strength training.

**Wendy Suzuki:** Here's what we know. The majority of the studies out there on the effects of exercise on brain function has focused on cardio exercises. By cardio, I mean exercises that get your heart rate up. So, treadmill, power walking, running, on a bicycle, lots of exercises like that. And absolutely, we know that that kind of aerobics exercise is effective for stimulating those new hippocampal cells to grow, for example.

Resistance training has also been used. There's not as many studies and the results are a little bit mixed, so it's unclear whether it's not as effective or maybe it's just as effective and we just haven't found the right formula. The truth is, a lot of exercises out there are a mix of cardio and resistance training, and that resistance training also contributes to getting your heart rate up. A good weight workout can increase your heart rate. So, I would say that absolutely, there's evidence that both of them play a role, but there's more direct evidence because more studies have been done that aerobic exercise is benefit. So, do not cut out all your resistance training because you think it's not good for your brain. Put it in there and have it be part of your regular workout.

**Bill Glovin:** And how does meditation and something like yoga fit in, in terms of improving attention span and decreasing stress?

**Wendy Suzuki:** I'd like to point out that especially these days, when many of us have gone through moments or real, at least, mild panic attacks for all the information we are receiving. The fastest way to stop even a mild panic

attack is to use your breath, to breathe deeply in and out. And let me tell you the neuroscience perspective, and then I'll relate it to your question about meditation. So, from the neuroscience perspective, by breathing deeply, by consciously slowing down your breath, what you're doing is you're activating a part of our nervous system that helps control our relaxation responses. This is, it happens to be called the parasympathetic nervous system that slows down our heart rate. It slows down our breathing, it stimulates digestion. And by consciously breathing deeply, you help kind of kick that relaxation response of your entire nervous system into action. And so, you can help stop a panic attack with this breath.

Well, it turns out that deep breathing is one of the oldest and simplest forms of meditation. And while the early meditators might not have been able to study it in a scientific fashion, they certainly knew from experience that deep breathing can be very relaxing. In fact, neuroscience has come in and some beautiful studies like for example, the neuroscientist, Richard Davidson, have really pushed our knowledge of the effects of meditation ahead, and shown that it does have significant effects on decreasing stress, anxiety, depression, and can even focus our attention. Now, we don't know exactly how it's doing that. We don't know the mechanisms yet. We have a much better idea about what's happening with physical aerobic exercise. But if you do both of these things, exercise and meditation, you can kind of get a double boost of decreasing the depression, anxiety, and a double boost of focus and attention. Again, something that all of us needs these days.

Bill Glovin: In terms of the coronavirus, I have a brother who's in his early 60s and his main source of exercise is taking a long walk every day, which is good.

Wendy Suzuki: Yeah.

Bill Glovin: So, the other day, he was telling me that he had really lost this sense of smell and taste, which is a symptom of this coronavirus. But otherwise, he's feeling well. He called his doctor and asked if he should come in for a test and his doctor said no. And he kind of self-quarantined himself up in the bedroom and he's been up there for two or three days. I was just wondering if he should still be getting himself out and walking, or if it's best to just kind of stay in one place and ride this thing out, rather than getting at least the minimal amount of exercise.

Wendy Suzuki: Well, I think that is an interesting question. I'm not a medical doctor, so I can't give any advice. But I think, for the greater good, it's very important

that if he does have a chance of being contagious and having the disease that he do everything he can to isolate as much as he can. Now, does that mean that he can't get any exercise in? No. He may not be able to go outside where he has a higher chance of meeting people, but there are lots of things that you can do in your bedroom to keep your activity up, including just walking around the bedroom. Okay, it's not quite as interesting as walking outside, but what if you walk while listening to a podcast? What if you look online and find a good yoga video or good whatever kind of exercise you're interested in, video that you can do in place, that doesn't require any equipment. There's a lot of them out there. So, there's a lot that he can do to stay active, but also stay safe for himself and everybody around him if he is carrying the virus.

**Bill Glovin:** Interesting. And just for my own curiosity, what inspired you to specialize in this area of research?

**Wendy Suzuki:** Well, that story is kind of inspired by very, very specific events. I gained 25 pounds, as I was trying to earn tenure at New York University. Why? Because it's very stressful. And I was doing nothing but working and a lot of takeout here in New York City. Suddenly, all of a sudden, I turned around and I'd gained 25 pounds. I was stressed out and really needed kind of a reset and I ended up going to the gym to try and lose that weight. And somehow, it stuck. I got addicted to these classes. About a year and a half later, fast forward, I had lost 25 pounds, I was feeling so much better, I had so much more energy. I was so much happier in my, not just because I lost 25 pounds but I was feeling strong and good.

I'll never forget the day, about a year and a half after I started that exercise regimen, that I was in my office writing a grant, an NIH grant, and I had this thought that went through my mind. And that thought was, "Gee, grant writing is going well today." I had never had that thought ever in my entire scientific career, because usually, I'm pulling my hair out and full of stress and anxiety while I'm writing these grants.

But the grant writing was going better. And I realized that it was because my focus was better, and as we all know, all the writers out there, you really need deep focus to get a good writing session in. My focus was deeper and longer and my long-term memory, which was the focus of my lab before I switched to exercise, was also better. I could remember things better. And that was a moment that I realized that. It came to consciousness. That's what got me interested in what was causing it. The only big change that I have taken in my life was changing my exercise regimen, going from complete couch potato and takeout to really regular

gym-goer. And I knew I had to study it because it had such a profound effect on myself and the way that my brain was working. As I started to getting to these studies, it was clear that it had such potential to change so many lives, either in normal times or in the time that have a coronavirus, that I really needed to study it. So, that's why I studied the effects of exercise.

Bill Glovin: This might be a little bit of a strange question, but can you tell us who Marian Diamond is?

Wendy Suzuki: That is not a strange question at all. Marian Diamond was my undergraduate research mentor, and she is an extraordinary, was, she passed away two summers ago. She was an extraordinary neuroscientist, not only the first woman to ever earn a Ph.D. in anatomy at UC Berkeley, but she and her colleague were the first to demonstrate that the adult brain could actually change in response to the environment. That is, how you live your life, the kinds of things and activities that you do, actually had an effect on the size of the brain. They made a wonderful documentary about her that was nominated for an Emmy award two years ago called *My Love Affair With the Brain: The Life and Science of Marian Diamond*.

And the experiments that she's best known for is an experiment she did in the 1960s, when nobody thought the adult brain could change at all because there was no evidence in support of that. Well, she didn't believe that. And she did an elegant experiment where she put a set of rats randomly, either into what you called an enriched environment with lots of toys to play with and big environment, lots of space to run around and lots of other rats to play with, or an impoverished environment which only had one other rat and no toys. Both of them got free food and water, as much as they wanted. And if the environment had no effect on the brain, then their brain should be identical at the end of the three-month period.

Well, when she looked, she found that those enriched environments actually increased the size of several brain areas. Visual cortices, touch cortices, frontal lobes were increased. It was the very first time anybody had seen evidence that the outside environment had any anatomical effect on the brain. And later, so, this is what I grew up with in my undergraduate world and science. Then, she and others demonstrated that a major factor that was causing this brain change was the exercise. Because in that big old rat cage, the Disney world of rat cages, those rats were able to run around a lot more than the rats in the small

impoverished environments. So, we have her to thank for what has become this really exciting field of neuroscience, the study of the effects of exercise on the brain. So, that's who Marian Diamond is.

**Bill Glovin:** Well, I think she'd be very proud to know you're kind of carrying on in her footsteps in this degree. And so, in terms of your own research, where are you trying to take it, in terms of exercise and the brain?

**Wendy Suzuki:** So, I am very interested in answering a question that I get asked a lot when I give talks all over the country and all over the world. So, I tell people about the transformative effects of exercise, that it has immediate and long-term and protective effects on your brain. And here's the thing they all want to know. "Just tell me what the minimum amount of exercises that I have to do to get all those good effects. I don't want to do too much, but just tell me the minimum." That is a specific research question, that is an individualization, that is a personalized kind of exercise prescription.

And that is the main question that I'm working on right now, in the context of a tech startup that I started a couple of years ago called BrainBody. So, I'm co-founder and CEO of an AI-based health tech company called BrainBody that quantifies the effects of physical aerobic exercise on your brain. And we are working with senior centers like Maplewood Senior Living, and developing this platform to be able to tell people what exactly is this workout that you just did. What does that do for your brain? And how can we compare and contrast it with the other workouts that you might do next week on your brain? So, that's the practical question is, where my research is headed right now.

**Bill Glovin:** So, is there such a thing as too much exercise?

**Wendy Suzuki:** That's a great question I get asked a lot from the people coming to my lab to do exercise studies. And the truth is that in theory, yes. Too much exercise could be bad for the brain. It might impair the respiratory system. You might not get enough oxygen if you are just working out too hard. But the reality is that very few people can actually get to that level of workout where it would be detrimental. And the people, that would be people like Olympic athletes that really have trained and trained and trained to push their selves to the edge and beyond. Most of us will give up before it can be detrimental to our brain. So, the answer to that is that yes, in theory. Yes, really, really high levels of a workout would probably be detrimental to the brain, but most of us cannot get, the vast majority of us I would say, cannot get to that level of physical activity.

Bill Glovin:

Well, I think that's a great note to end on. I can't thank you enough for taking the time to do the podcast. For people out there who want to know more in terms of the science, you can definitely Google Wendy Suzuki and find her Ted Talk. *The Huffington Post* did something with her. And she gets into the nuts and bolts of the science in some of those and it's very fascinating. Anyway, you can find this podcast and all our brain science content at [dana.org](http://dana.org). Meanwhile, have a great day, stay safe and healthy, and thanks for listening.