Introduction to Exercise Oncology

Well, Karen. Wonders, such a pleasure to have you on this, you are a doctor, and, what do you specialize in? So I have a PhD in exercise physiology and have been conducting research in the world of exercise oncology since 2003.

So more than 20 years now. That's incredible. And and what brought you into that world, let me was what what fascinated you with that? Well, it's kind of funny because I always say I didn't choose cancer.

Cancer chose me. And, you know, coming out of college, I wasn't really sure what path I wanted to go down. I had a bachelor's degree in exercise science and decided to stay in school until I figured it out, and that's ultimately how I got a PhD.

And it just so happened that I went to the University of Northern Colorado, which was one of the very first universities in the country to look at the effects of exercise during cancer recovery.

So I kind of stumbled into this field as a doctoral student. But then I saw all the benefits that exercise had and the life of someone who was battling cancer.

And not only that, but we had, you know, we had a lab where we would work with patients as they were going through treatment. And then we also had a lab with rats that we would run on treadmills and measure how exercise helped them as well.

And so I got to see kind of all the sides of it and just became a believer. That's incredible. So tell me, I mean, because a lot of people, when they think cancer, they think, oh, now you got to rest.

You got to be careful. Yeah, you gotta conserve your energy. Yeah. So what do you tell them? But I mean, what what should they do? Yeah. And that's a great question because when I first learn that my job was going to be to do exercise training on cancer patients, that's what I thought too.

I thought when when someone's battling cancer, aren't they tired? Aren't they sick? How in the world are we supposed to exercise them? And what I think a lot of people don't realize about cancer, and with exercise in particular, is that when you're feeling that fatigue and I understand it's a whole body, an overwhelming fatigue that these patients experience when you rest, when you lay in bed, when you take a nap, which is what you want to do, no one would fault you for doing that, but that actually serves to exacerbate your fatigue levels, where if you would just do a five minute walk, even if it's just down your driveway to your mailbox or around the inside of your house, you know, even that can help boost your energy levels.

And so I really believe that with exercise, it's meeting the person right where they are and helping them with whatever it is they can do that day. Maybe they can't run a mile, maybe they can't ride a bike for 30 minutes, but can they walk for five minutes if they can?

Let's start there and then let's build. As your energy improves. And so I mean, obviously there are different stages in cancer and what, what you're dealing with.

Can you just for people, you know, when they're dealing with cancer, what's the one thing that I've heard is that exercise? Yeah. It's like, increases longevity by like 30% just by itself.

I'm not sure if I'm correct or not, but it just seems like if if there was a drug that did what exercise did, whoever owned that would be a multibillion air.

Yeah. So what kind of benefits to the exercise really have on the body. What does it do on the body for cancer patient. You know I really believe whether you have cancer or not that our bodies were created to exercise.

Because if you study the physical energy of the body the nervous system, the cellular system, the way the blood vessels work with the muscles and everything else, everything happens to accommodate exercise.

Why Exercise Helps During Cancer Treatment

And when the individual exercises things inside the body, improve and that's true whether you have cancer or not. With cancer, though, we see across the board in in so many different tumor types that exercise can help improve functional status.

It helps people with their quality of life and their activities of daily living to maintain their independence, to continue working, to care for their families and their kids and their grandkids.

There are data out there that do point to improved survival rates for different types of cancers. Also, it can help prevent cancer from starting in a lot of types of cancers that have been studied.

It improves mood and improves sleep. I mean, I really believe that there's nothing in our lives that cancer that that, you know, cancer can touch. That exercise can't help at least attenuate the effect of, of cancer on that particular body system.

Yeah. I mean, you're talking about, and the mood I mean, here you have, you know, we all know endorphins. You know, they. Yeah. When, when you move and exercise, the release of endorphins and, I mean, that in itself has a tremendous impact on your immune system, right?

Oh, yes. Yes. In fact, one of the things that we do with our patients that are in chemotherapy is we'll actually exercise them at a low to moderate intensity.

And so when you think of the fatigue and you think, gosh, I don't know how I can exercise, think about a low to moderate intensity exercise, exercise that you can still talk while you're doing.

You can carry on a conversation, you know, low impact. But there is data to show that when you exercise in a low to moderate intensity level, that actually improves your immune function.

And earlier this year, we published a study looking at patients with advanced cancers who exercised while they were receiving their chemotherapy. And in those patients, they had significantly fewer dose delays and dose reductions with their chemotherapy.

And as you know, if someone is seeing, a decrease in their immune function because of the chemotherapy that they're on, they do have dose delays and they do have dose reductions.

So anything we can do to try to limit those is only going to help improve the survival rates for these patients. And so just a low to moderate bout of exercise can help to prevent those altogether from happening.

And then give that patient the best chance at survival. And that's a big deal. Yeah that's a huge, huge deal. Because a lot of people when they step into, you know, they you feel good, you step in to chemo and then you don't realize the impact that it's going to have on your body.

And so, and then all of a sudden, yeah, your, your blood numbers plummet and you're, you're not able to complete the treatment, and now you're not able to have the impact on the cancer you're wanting because your body can't handle it.

So to have these kind of tools. So to be able then to make sure you don't have that dose delay and you're able to go through the treatment becomes so important.

Yes, it really does. It really does. And you know, I mean cancer is cancer. So there's always going to be the cases where it doesn't work out. But even in those scenarios, you know, I now I've been doing research for more than 20 years and for 12 years operating my own business, where we work with patients who are going through cancer.

And even in terminal cases, we still see that exercise benefits that person, and it does give them the remaining time they have it. It improves that time for them.

And so, yes, across the board, no matter what your prognosis is, no matter what the diagnosis, I do believe that everyone who's battling cancer should exercise.

Yeah. Because I mean, one of the things is that, you know, the white blood cell count dropping and hemoglobin dropping and those those are the big factors that I know a lot of oncology just look at and, and I know, exercise is just known to boost those type of numbers and really kind of stimulate bone marrow, stimulate the body to produce more of these, you know, kind of cancer fighting, components.

Yeah. Yeah, definitely. I mean, I think it just goes back to what I said earlier that I really believe our bodies were created and designed to exercise and everything gets better as a result.

So so you mentioned you've done a lot of kind of studies. I mean, can you tell me, you know, some of those studies and some of the outcomes that you, that you've seen that you, you know, I think it'd be fascinating to hear for sure.

So just to give you a little bit of my background, as I've said, I've done research in this field now for 20 years. 12 years ago, I started an organization called Maple Tree Cancer Alliance, where we partner with hospitals, we partner with fitness centers across the country.

We have 65 locations, in the US, and then we work with 14 other countries. And over the last 12 years we've worked with nearly 20,000 patients. And so we're able to collect data on these patients as they move through our program.

So they come in, we do baseline measurement on them. We look at all of the components of fitness. So cardiovascular muscular strength, muscular endurance, body comp, range of motion balance posture all of that.

And then every 12 weeks as the person moves through our program, we're continually measuring them to see how is exercise impacting their response to their cancer treatment and all of those those factors that are so important.

And we've seen on, you know, on these 20,000 patients, even when someone's exercising during chemotherapy or during radiation, they are completing chemotherapy and they're completing radiation stronger than what they were when they began chemotherapy, which just flies in the face of everything we think of when we think of cancer, doesn't it?

You know, you think, I'm going through chemotherapy, I'm going to be in bed, I'm going to be sick. I'm going to be weak. I'm not going to be able to participate in the things that I love, which is just makes that cancer diagnosis all the more difficult.

But we can point to our data now on more than 20,000 people and say, if you trust the system, if you trust the process, and you do what you can on the days that you can, chances are you can complete chemotherapy and you can complete radiation stronger than what you are right now.

Research Findings and Patient Outcomes

And that's so encouraging. We also are big advocates for getting this approved by insurance so that it can be available to more patients. And so to that end, we're always conducting research to not only show the benefits physically and physiologically in the patient, but also financially as well.

So when someone's battling cancer and if they exercise, are we able to keep them quote unquote healthier? Do

they have a less symptom severity? Are they going to the hospital less?

Are they go into the air or less? Is if they are in the hospital, is there length of stay shorter than what a person who wouldn't be exercising? And across the board time and time again, we have seen a decrease in health care utilization for those patients who exercise, even on the hard days.

It really does help. And, it's easier. I mean, obviously the sooner the better to start with the exercise, but I mean, what, what kind of frequency and, and and again, I'm, I'm sure that this correlates with kind of where an individual is at, but what is kind of an optimum frequency and intensity for an individual and what type of exercises, you know, should they be looking at?

That's a great question. I will say that about 90% of patients, at least the patients that we have worked with through the years, were sedentary at the time of their diagnosis.

So if you are listening to this and you did not exercise before your diagnosis, it is not too late to begin an exercise program. If you're hearing this, you can start a program today.

Ideally, we would see them at baseline, and the benefit to baseline is we can get in and get some testing done before they start treatment. So if you're in the middle of chemotherapy and you start a program, that's great.

But the fitness testing that we'll do is probably not going to be reflective of what you were at the time of diagnosis, just because chemo will have taken its toll.

The American College of Sports Medicine is really who we look to to determine exercise frequency and duration and intensity and that sort of thing. And they released a paper back in 2019 that gave guidelines for exercise, prescription and programing.

And ultimately, if the patient is able to tolerate 150 minutes of aerobic exercise each week, that would be the goal. Now you can break that up into 30 minutes a day, five times a week.

If the person's unable to do 30 minutes at a time. So you get on the treadmill, walk for 30 minutes, and if that's too much, you actually receive just as much benefit.

If you break that up into ten minute bouts throughout the day. So ten minutes in the morning, ten minutes at lunch, ten minutes at dinner. At the end of the day, that's a cumulative dose of 30 minutes.

And that's still just as beneficial as if you would have done it all in one sitting. So that's something where if you really are too fatigued and 30 minutes is just out of reach, you can do that to build up your time.

In terms of intensity, I always say you should be able to carry on a conversation with someone. Maybe not the way I'm talking now. Like you might need to stop and breathe a little bit, but if you're to the point where you can't talk, that means you're exercising too hard and just slow it down a little bit more and continue.

Don't stop. Just slow it down a little bit so that you can talk to someone. That's how you can kind of gauge your intensity level. And then for, you know, what kinds of activities to do.

I would say whatever you like to do, if you like to walk, then walk. If you like to swim and you have a place to swim, you're not where I am in Ohio, where we get like a couple months a year, we can do we can swim, then then do that.

But really, whatever you enjoy doing, that's what you're going to stick to. If you hate to do a certain activity, don't do that, because then you're just going to dread the exercise program.

And we want you to enjoy it. We want this to be a great decision that you've made. And how does you know things like, you know, strength training build into this as well, that, you know, this, does that add to this or is it mostly

cardiovascular?

That's the most important. Yes. So at Maple Tree, which is my organization, Maple Tree Cancer Alliance, we recommend resistance training with cardiovascular training.

And so a full body workout is really where you're going to see those benefits. The American College of Sports Medicine recommends you resistance train two days a week, so that can easily be one day for upper body training, one day for lower body training, and usually what I would recommend, just as a general recommendation, would be 2 to 3 sets of about 10 to 12 repetitions.

So you do the movement ten times and then you rest and that's one set. And then you do it again ten more times. And then that would be set number two in a full body workout.

I think it is important though to work with a trainer and someone that has a certification in exercise oncology, just to ensure that the movements you're doing are safe, that you have good form, that you're not exercising too much and putting yourself at risk for injury or even potentially lymphedema and other other considerations that you should be aware of.

But if you work with someone who's certified in exercise oncology, they can design a safe and effective program for you. Let's say you have an individual that does not have access to a trainer, and they're just kind of at home, and they are one of those 90% that you see.

I mean, what would be kind of an easy, non dangerous kind of upper body, like doing push up against the wall or I mean, what what would be something that, that can be beneficial.

Yeah. Pushups against the wall is a is a great idea. I would say bodyweight movements are usually relatively safe. If you go to our website, Maple Tree Cancer alliance.org, we have some videos and some resources that people can download for free.

That would help that individual to get started and to do safe exercise. I always live by the motto that something is always better than nothing. And so if you listen, there's a third of the country that does not have access to an exercise oncology program right now.

And so a third of the people listening, chances are you might not have an exercise oncology program where you live. So number one, ask your doctor to put in one and number two, ask your doctor if there are any limitations or contraindications things that you should be aware of.

Sometimes doctors will put limits on how much weight that person should be able to move safely. So if that's the case, you would want to know that. And then yeah, I would say start by taking a walk and finding a partner.

Someone who can walk with you. Oftentimes when someone's diagnosed with cancer, friends come out of the woodwork and they want to make you dinners and they want to do something to help.

And sometimes people don't know what they should say to these requests. Well, I would say yes, come and take a walk with me. Come to my house at 8:00 tonight.

We'll take a walk together, like hold me accountable to make sure I'm moving my body every day. And that's a great, tangible way that you can tell your loved ones and your friends to to care for you while you're going through this.

And then you also have the category of people that are, you know, they, they are the 10% that come to you that, I mean, they do exercise. They're not upset. Atari. Terry.

Yeah. And they love the adrenaline rush of being out there. You know, hitting it hard. Yeah. Biking, running, lifting all of those things are their limitations.

Exercise Guidelines for Cancer Patients

You should put on that individual where certain things are too much. Well, and that would be a conversation to have with the doctor because there there is an upper limit where if you exercise at too high of an intensity, it can negatively impact your immune function.

And so you would want to be aware of that. In general, though, I would say if someone's been exercising before their diagnosis, as long as they're handling the treatments well and they have that energy to continue exercise is generally it's going to be safe for them to continue to do so.

But again, I would still have that conversation with the doctor just to see what are my limits, what are the contraindications? How do I know if I've pushed it too far?

And then the doctor can speak directly to that patient because a lot of these are going to be on a case by case and an individualized basis. Yeah. Are there certain I mean that, that obviously this, like you're mentioning, it's really important to have a conversation with your doctor and it's impossible when when you don't see the patient in front of you.

But are there certain things that doctors generally look at? Yeah. In order to be able to determine that this is this is too much. Yeah. You need to slow down.

Is that, like adrenal function? Is that, you know, the injury? I mean, what what are what do they usually look at? Well, I think definitely the health history of the person would impact what the doctor would recommend.

So health history if there have been injuries or prior surgeries those would definitely be taken into consideration. I would also look at the medicines that the person is taking and how do those medicines impact the exercise response.

Sometimes you'll have a blood pressure medication, for example, that can lower that person's exercising heart rate. And so if they're not exercising with a trainer and they have done a calculation on the internet to say, well, your heart rate should be at 140, but this drug only takes your heart to 110.

Well, that's that's a problem that the patient needs to be aware of. So looking at medications, is there any type of medication that impacts balance that can cause dizziness.

Those are all things that I would take into consideration. And then also I think the individual's risk for lymphedema would be taken into consideration as well.

You know, have they had surgery where lymph nodes have been removed and are they seen an increase in swelling and, you know, different signs of lymphedema that would warrant probably a referral to physical therapy and then to an exercise program.

But all those things the doctor can speak to or a trained and certified exercise oncology instructor can also look at that and determine, you know, what kind of information to get from the doctor to help that patient, which we want to have all over the United States. Yes.

Be covered by insurance. Yes. And for a standard of care. Yes, exactly. Yes. So, then you have the issue of the, the different treatments that that people are receiving and how to kind of sandwich, exercise around that, like, you know, surgery.

Yeah. What is common? Well, what is normally suggested to weight after surgery. And I again, I recognize that this is case by case. You know, the doctors still have to evaluate, but what are kind of the norms.

And in preparation for surgery, you know, what should you look for there around chemo? You know, day before. Is that the best? Can you do it the day after radiation?

I mean, all these different things. Yeah. What how how should you kind of space exercise around these events? That's great question. I would say the best time to start the exercise program is right at diagnosis, especially if you have a surgery coming up.

Because what you're going to do in that window, whether it's one week, whether it's six weeks, whatever that time period is, if you begin an exercise program and stay consistent with that exercise program leading up to the surgery, you're going to enter that surgery strong and able to withstand the surgery.

It'll help your body recover faster, and you're going to fare better in your treatment process if you start right away. So definitely I would start right away.

Depending on the type of surgery, most often that patient is going to be released into physical therapy. Now, sometimes on a case by case basis, the patient can do exercise in parallel to physical therapy.

And the physical therapist then would work on that particular body part that was limited by the surgery. And then the exercise. Individual can can work on everything else, kind of the whole body approach.

So again, it's a case by case basis. Sometimes they want you to start moving and doing range of motion exercises right away. Other times they want that patient to wait till drains are removed.

Other times they want to wait six weeks. But that's generally the window of time now during chemotherapy and radiation. Yes, absolutely. I would continue to exercise.

It's safe and effective to do so. We will have a patient wait. So anywhere between 24 and 48 hours following chemotherapy and following radiation, just because following chemotherapy and radiation, you're going to see higher inflammatory markers.

And the body is not going to respond as well to that exercise program as they would if you would wait. And so, just as a precaution, this is not even a clinical guideline.

It's just a recommendation, but it's something that we follow where you'd want to wait anywhere, anywhere from 24 to 48 hours after leading up to chemotherapy is a great time to do it.

Because you're getting the antioxidant stimulated, you're getting some free radicals out there to destroy. And the the research study that I had done in my doctoral program was always leading up to the chemotherapy and how is that person then going into that chemo treatment, you know, what is their antioxidant levels and how is all that working to make that patient able to handle the chemotherapy that they're about to receive?

Yeah. You also have I mean, when you exercise, you don't need insulin in order to be able to drive sugar into the cells. And so, you're going to have them, I mean, you're reducing them, the IGF one know, which is a growth factor that you, you want to have fairly low when you're dealing with, with cancer, because you don't want to have that, that growth stimulation.

And then also it will, reduce the sugar that's accessible to the cancer. So the cancer is going to be more in a starving mode, I would assume, kind of right at, at the time of the, of the chemo.

So it's going to be more impacted by the chemo and also be wanting to get more of whatever that is. Yeah, absolutely. And I think you brought up a good point that so often people who are battling cancer have other chronic conditions that they're battling at the same time.

So it's, it's very common to see someone with diabetes and cancer or someone with high blood pressure and cancer. And I think what's important to know is that exercise doesn't just help people with cancer.

It helps with any chronic disease. I mean, there's an entire subfield now of exercise physiology called exercise is medicine. And that's not just medicine for the cancer patient.

It's medicine for everybody. Regardless of the chronic illness that you're battling. It will help with all of that. So you know you're not counted out.

If you have more than one chronic condition, you're you're facing. Yeah, yeah. And so why I'm before I want to kind of learn more about your organization, why you started it and what services you offer there.

Because I mean that that seems like an incredible resource for a lot of people out there. Yeah. Is there anything that you feel is really important that for our listeners to know about exercise, that they yeah, because they're many of them.

Timing Exercise Around Surgery and Treatment

Yeah. Either they're kind of pretreatment that they have somebody that of their loved one going through a treatment or the active treatment or post-treatment or, you know, is there something else that's really important for them to understand in regard to the exercise?

I would say the most impactful thing a patient ever said to me was about six years ago, I went out to lunch with a patient who had been at Maple Tree for about three years, and she did not have a great diagnosis when she came in, but she never gave up.

She went to all of her treatments, she came to all of her exercise programs and really became an ambassador for the program. So I asked her, I said, what was it that made you come to Maple Tree?

And she told me that she was more afraid to come to Maple Tree to start an exercise program, than she was to take her chemotherapy. And I think if you're listening to this and you're newly diagnosed and you're so afraid of what is this cancer journey going to bring, how is your body going to respond?

And you're listening to us talk about exercise. You might think, well, I can't possibly do that. Or I you know, that sounds so hard or so difficult. What I would say is find someone who's going to meet you right where you are and start there, and you can make small and incremental changes and take small steps at a time to improve.

But we look at this as this is going to be one of the best decisions you make is to start an exercise program when you're battling cancer. And so it's not something we want you to be afraid of or intimidated by, or to think you have to be in good shape before you start an exercise program.

It's all about meeting you where you are on the good days, on the bad days, and walking with you through this cancer journey. And so just don't be afraid to start something like this, because it really can help you.

And what made this patient stick with it? This is six years later, and it sounded like almost, you know, because the diagnosis wasn't that great, that the likelihood of a positive outcome was not that, you know, promising.

So obviously six years is fantastic, but what what made her kind of stick with it? I really think it was because she saw such a positive change in her, in her life.

She was receiving radiation to her pelvic area and pelvic floor radiation. Like what? Anytime you get radiation to a pelvic area, it can cause a lot of pain and because of that, she was in a wheelchair when she first came to Maple Tree.

Within 12 weeks, she was able to walk unassisted without the use of a cane. I mean, it was that dramatic of a change. So she was suddenly independent again.

She was suddenly able to work again. She could move without having that pain. And she saw that, and she realized that this is this is actually working.

So I'm going to stick with it. She, did have a cancer recurrence a couple of years ago, but continued to fight out of

that. And she's still living today, and she's exercising on her own and is still an ambassador for not only our organization, Maple Tree, but just for exercise in the way that it can help you even if you've never done it before.

It can have such an impact on your recovery. Do you have another story like that? That was really cool. I have so many, so many stories. You know, that's that's one of the things that I think is so powerful is to share those stories, because it's easy for me to say, you should exercise when I have a PhD in exercise physiology.

And, and, you know, so it's easy for me. But if you see someone who looks like you, who has the same hesitations that you have, then you can start to see how this can directly help you.

One of my favorite stories was we had a woman come to us. She was 89 years old, had never really exercised before starting this. So she's 89, started an exercise program which means you're never too old to begin an exercise program.

But she had been active in her younger a lot like her younger years. She was active, the, of course, the cancer diagnosis and different things that she, you know, medication she was on.

She had some balance issues. She had some upper body strength limitations. And her goal when she came to Maple Tree was that she wanted to ride a horse again.

It had been nearly 20 years since she had ridden a horse. And so my trainers are like, okay, we're going to do it. And within 12 weeks they were able to help her build up the strength that she needed to get on to the horse and then ride a horse on horseback again.

It was it was an amazing story. And to see a woman nearly 90 years old, riding a horse for the first time in years was such a gift, such a gift. That exercise brought to this, to this woman.

And this was while she was battling cancer at the same time. Yes. Yeah, she she had cancer. Yes. That's incredible, I know. And what's so funny is she was just this little, teeny tiny thing.

I mean, she's she was a very, very petite woman. And so to see her jump up on this gigantic horse was just so cool.

Patient Stories and Maple Tree Cancer Alliance

And it's so awesome. That's awesome. So you tell me a little bit about your organization and why you started it. So I mentioned, you know, as I was going through my PhD program, and really that was my first introduction to cancer.

And I will say, not only was I skeptical, you know, what are we doing? Is this safe? Am I going to get sued? But I also thought that, you know, as I did it and as I worked with these patients and saw the benefit, I thought, well, everyone must know this, right?

You know, this is just like cardiac rehab for a cardiac rehab, if you have a heart attack and you know, everyone knows that. So I graduated in 2006 and started working as a professor and having a family.

And, you know, it's just kind of busy with life. The following year, in 2007, my grandfather was diagnosed with colon cancer, and he lived about four hours away from me, and I knew he had a very aggressive tumor.

And so I remember saying to him, you know, you're not going to be able to he was active before his diagnosis. And I said, you're not going to be able to continue this level of activity.

You need to ask your doctor, where's the nearest cancer and exercise program that you can do? And his doctor said, oh, no, you need to rest. It's not safe to exercise.

You should not do that. Your granddaughter doesn't know what she's talking about on and on. And it hit me that all

of these benefits that I had seen in grad school, that we had measured in the lab, that I even won awards for conferences when I would present on this data, it wasn't translating into practice, and it wasn't impacting the way patients were cared for.

And so that's why I began my organization and Maple Tree, Maple Tree Cancer Alliance. But the maple tree came from my grandfather had big maple trees in his front yard.

And so I wanted to honor him and, you know, have a positive impact in the lives of people who battled cancer. So it's been 12 years. Like I said, we have 65 locations across the country.

We're international now, and we have been able to impact cancer care. You know, as of next year, it exercise will be part of the standard of care for breast cancer, and we're already working on all the other tumor types as well, so that everyone who battles cancer will have access to an exercise program that is so awesome.

And they can go on online, at, on your website to find where the, the nearest location or, or able to, to do this for them. Yes, yes, the Maple Tree Cancer alliance.org.

And so we do have patient programs where you can sign up directly and work with us if there's not an exercise program at your hospital where you're being treated, we can help you virtually.

Thanks to Covid. Yeah, exactly. It's yeah, it was a challenge, but it it really brought forth a lot of these opportunities that, you know, people didn't invest in.

So, so that, that, I mean, that that is the benefit. So. Well, Karen, this is so, so wonderful. This is so amazing. I'm so grateful for what you're doing.

And, and and I'm excited to, you know, see how exercise some movement is brought into the oncology world because, I mean, to me that is the best medicine of of all the medicines.

I mean, I, I can give supplements and obviously you should eat well and you can do all these other things, but you know, if you don't move, you know, then all of a sudden, you know, the the body thinks that it shouldn't be living. Yeah.

And like you mentioned, life is movement and, and to me, cancer is kind of like stagnated energy is kind of like that frozen energy is just meaning that the body, you know, the energy is not moving in that place.

So the moving this is crucial. Yes, I, I agree, thank you so much for having me on your show and letting me share with your listeners. That's been a pleasure. Thanks so much.