

SHANNON L. MIHALKO: Yes, switching gears just a little bit, looking at breast cancer and exercise. And I want to walk us through a little bit in terms of what happens to physical activity patterns once women are diagnosed and treated for breast cancer. And there are a lot of people here. I'm going to present a lot of our own data. I appreciate the opportunity to be able to do that today. And I'll show you some data from other labs outside of Wake Forest as well. But a lot of people here at Wake I just want to make sure that I acknowledge.

So what are we going to cover in the next 30 minutes? Well, surviving to thriving. We've heard a lot today. I've really been interested in hearing all of the presentations today and the amazing advances in diagnosis and treatment of this what I consider chronic disease and about surviving, what it takes to survive. And physical activity really plays a role in terms of the rehabilitation efforts that we engage in and moving from surviving to thriving. So that's the framework that I'm coming from.

And to get us there, first I want to talk about physical activity rates. So what happens to physical activity once women are diagnosed and treated for breast cancer? And then why do we even care? Why did Ed ask me to come and talk today? Why is physical activity important? And what can it do for all of these women? We've done a lot of clinical trials now looking at exercise behaviors and diet behaviors as well. And I want to talk you through a couple of those just as examples to show you, well, if we actually get women to engage in this behavior, good things happen, lots of good things. So we'll look at physical outcomes as well as psychosocial outcomes. And then we'll finish off on--I'm a behavioral psychologist. So I can't do talk like this and not talk about the big elephant in the room, which is how we know it's good for us, women aren't doing it. How do we get people to do it? Right. How do we get women to engage in this lifestyle behavior? So that that's where we're headed.

Like I said, breast cancer and it's treatment, we've heard a lot about it today. It has an effect, as all of you know, on fatigue and other symptoms. But it also has an effect on upper body strength, range of motion, weight gain. I'll talk about it just a little bit. We have another talk coming up looking at nutrition next. But what does it do to physical activity? So the question is are women with breast cancer participating in physical activity?

Well, we know coming in that they're not, right. It's a risk factor. So they're already sedentary to begin with. Most of them, certainly not all, but many are sedentary to begin with. And Kerry Courneya is a colleague an a good friend up in Canada who's done a lot of real seminal beginning work in this area looking at physical activity and all kinds of cancers and has shown over and over again that physical activity certainly has a market decline during treatment. It seems to bounce back, but I always say bounces back to what? Bounces back to low. Low is low. And it doesn't always after treatment come back in fact. In most cases, most studies will show you it doesn't actually come back to baseline. And these are other studies leading more into just recently. Many different sample sizes here, showing a range from 11% to 10%. But some showing as much as a 50% decrease in recreational physical activity.

OK. So physical activity declines, right. Well, not for everyone. And what about those women who are physically active? How does that have a positive impact? So we are currently-- we have an ongoing study. We've had it going for years now right here in our surgical breast care clinic. And right now we're at 311 women that we observationally follow over time. And they come into our study and we perform baseline assessments. And then the assessments, roughly at this time points with wiggle room depending on when they just now are scheduled to come back into the clinic. And this battery has many different things. I'm not going to talk about all of these, but they're all related to physical function and physical activities. So we assess strength, range of motion, their own self-reported, how are they doing in terms of their physical function, and, of course, their physical activity participation.

What we show is that those women who do-- if you can see it's shaded, that second line across-- who report that they are engaging in moderate levels of physical activity, they actually have increased strength, that's number six there, grip strength. They have lower BMI, lower waist circumference. They participate in all different kinds of physical activity, not just aerobic activities. Some of them are also engaged in resistance training. But this is the minority. We certainly have found in these 311 women that there are staying stable in their mild activity but declining in their moderate activity. Strenuous isn't even worth talking about because nobody does it. And in terms of strength training, nobody's really doing much more than one day a week on average across 300 women. And we are going to see that that falls very much short of national recommendations.

But for those women who are participating, there are many outcomes. Physiological outcomes include aerobic capacity. We're going to talk about that in a little bit in light of Dr. Klippens talk earlier and the cardiotoxic effects that we've been looking at with Greg Connelley's group and how physical activity might be one of those behavioral interventions that she mentioned that could actually have an impact. Symptoms, physical activity has been linked to symptoms, body composition, immune and endocrine function, and muscular strength.

Just a little bit of our own data to corroborate this. More active women had increased flexibility. And this was functional capacity with the six minute walk, which is a measure of cardiovascular function. And the more physically active women are, the better their cardiovascular health. But also with swelling. And in this we found that those women who had more activity reported no swelling compared to lower levels of physical activity reported more swelling. And one of our clinical trials where we actually measured lymph volume, we found that the two biggest predictors of increase in lymph volume over the course of that 18 month trial were levels of physical activity and BMI. So physical activity plays a role there as well.

And, of course, as you would expect just like in any other population, no different, those women who are more physically active have a better body comp. And we'll talk a little bit more about that in just a minute.

So, OK, that's physical function. But a lot of what we've talked about today is survival and recurrence plays into that. And there have been some really good studies that have come out recently that have linked physical activity. You know [INAUDIBLE] did a lot to tell us about physical activity as a risk factor for first cancer diagnosis. But it also appears inactivity is associated with recurrent breast cancer. And that is held in many different studies. And then recently breaking it down by dose. Looking at an additional hour per week of activity decreases the risk of recurrence by 7%. So if you're one of those people who like a hard outcome like that, there's your hard outcome hopefully evidence in terms of the role physical activity can play.

I have to talk about psychological outcomes. I did say I was a behavioral psychologist, right. So physical activity impacts not just our physical health and our survival, but also our psychological well-being. So it's been linked with such symptoms as depression and anxiety but also with body image, self-efficacy, or confidence about somebody's physical abilities and their quality of life. And we've shown that ourselves looking at general life satisfaction or more health related measures like the SF36. Physical activity is linked with those psychosocial outcomes and also with every indicator of body image that we might possibly look at. This is a measure of social physique anxiety. How anxious are you about presenting your physique in front of others? And those women who are more active are less anxious about doing so.

All right. I made the case. Is everybody on board so far? So physical activity is good. Lots of really positive outcomes. But nobody's doing it. So what are we going to do about that? How do we make a difference? So we have over the past decade or so done several different randomized trials to look at ways to increase physical activity. Most of the work I do is in older adults so my pictures reflect that in older women. But RESTORE was one of the first studies done. And this Roger Anderson was here back when this started and myself starting with RESTORE. And it was one of the first studies to look at physical activity actually during treatment. Most of what you'll find in the literature still today is post treatment. And it might range. Women might be anywhere from 5 to 30 years post-treatment and they're all recruited into that exercise study. That's hard to tease apart when you're talking about the time course and how physical activity might play a role. So RESTORE was research on optimal recovery practices in breast cancer. And you can try to find the letters for the acronym in there. It's not an easy thing to do. But RESTORE started back around 2001. And we ended up recruiting over the entire five years 103 women. And they were randomized to an intervention group and to enhanced usual care. We had a little bit of an attention based program where they got standard materials.

It happened right over here. So the health and exercise science department that I am in on the Renalta campus. We have the clinical research center. So if you were to shoot across the brand new beautiful tennis courts, you would find yourself in our exercise facility. And we're lucky to have it off campus. No parking issues. And that's what it looks like on the inside. And our participants really enjoy coming there. We'll talk about preferences with activity in just a second. But what we found is in those 100 women at baseline-- so they're not randomized yet-- so again showing that physical activity, those who were participating in some-- the more activity they reported, they had lower body mass index, greater distance on the six minute walk, again a measure of cardiovascular function, aerobic capacity, and higher levels of health related quality of life at baseline. So cross-sectional. But what about over time?

Now they're engaged in this intervention. And I should say it was both aerobic activity and resistance training where they came two times a week, six months to the center, and then we eased them to working on their own although many opted to stay in the center. And so, good news, the intervention worked, especially in the intensive phase when they were coming to our center. They were more physically active compared to the control group. And you can see though by the time we were at 18 months, many of them were in the home and their activity level started to come back down, a very common problem in our exercise trials in terms of physical activity maintenance. We often get people to adopt activity, but to maintain it over time just like changing dietary practices is a difficult thing to do.

Those people in the intervention did have significant increase over time in their cardiovascular function. This is just one indicator of their psychosocial function. This is their confidence in their ability to engage in physical tasks was significantly higher. They were stronger. And they had better range of motion. So as we had hypothesized, right, and you can see there's barely a line there because there was no change in abduction in the control group. So just zero change. And so we had a significant, close to significant, not quite 0.17 on abduction. It was significant for the AD-duction, which is the other measure of flexibility that we had.

Others have done this as well and very recently. Resistance training is new in terms of looking at that in women with breast cancer that specifically focused on resistance training. And those studies also find increased lean mass, decrease body fat. And it's important to think about those things a little bit separately. So exercise certainly can make us stronger and that's important because what happens as we gain weight or as we get people to lose weight, you've got to think about your differences between fat mass and lean mass. And so we see this decrease in lean mass but it's often accompanied with an increase in fat masses. Women not only stop physical activity but they gain weight post treatment and diagnosis. So this post diagnosis gains and fat mass and lean mass were found. But physical activity can help and aid in that. So it can help to increase the lean mass and help to alleviate problems with sarcopenia.

I mentioned weight gain. I'm only going to touch on it briefly because I know we're headed there. But it has so much to do with our upcoming physical activity trials that I think it's important to talk about. So certainly this is a study by Irwin done in 2005. 514 women. And this is distribution of weight changes from baseline. So those who lost weight there on the left, you see a very small percent, 5% to 10% there. And then the majority of women gaining weight. And some women gaining more than 5 kilograms of weight in their three year follow up.

Weight gain, just like sedentary behavior, weight gain is not a good thing either. It increases our risk of recurrence, decreases survival, leads to distress, and other comorbidities. But exercise can play a role here as well. And so it can improve body composition. It can reduce adiposity or fat mass and it can increase lean mass if we include resistance training. So be careful. A lot of times when you see the literature it'll just say physical activity or exercise and it's really important to differentiate what kind, what mode of physical activity are we talking about. We're talking about aerobic activity, especially if its non-weight bearing types of activity. You're not gaining lean mass in those types of activities. And so resistance training is becoming a piece. It was in RESTORE. It was a piece of RESTORE but it's something we're focusing more and more on in our trials here at Wake Forest.

OK. So I got us to the point where now I want to talk, hopefully, with what will interest a lot of you is how do I talk about all of this with my patients and how to increase actually change behavior, the million dollar turn the light bulb switch on question. So we know they're living longer. We talked all about that today and the advances in treatment. But the lack of physical activity can contribute to weight gain, can influence sarcopenic obesity, so a decrease in lean mass and many other negative outcomes. Physical activity in these interventions, if we increase activity it can combat many of these negative outcomes. And so how do we do it?

Well, rehabilitation. No, it's not a new word. We certainly don't own it in the cancer world. And in fact, luckily here at Wake Forest we have Paul Ribosol and others who really led the way in cardiac rehabilitation for the state of North Carolina that then decades ago became the road map for cardiac rehab all across the nation. And Dr. Ribosol was the chair in my department for 16 years I think he was. So we were lucky to have him on board in our very first studies. He was part of RESTORE. And he always said, it's exactly like it was back when we started with cardiac rehab, you know. Where people would have these cardiovascular events and they would be told to get in your bed, don't move, don't do anything. And now we get them up and we get them moving as soon as possible. And that's really important. He said, I just can't believe other chronic diseases are following the same path. We're not automatically implementing activity types of interventions in populations like breast cancer.

So rehabilitation is simply to restore or bring that person back to a condition of good health. We're not the only ones looking at this. I mentioned Kerry Courneya. There are others that are very interested in where to fit physical activity into the trajectory of treatment during treatment, post treatment, what's the best timing for that. Typically in comprehensive rehab we have patient assessments. Maybe that needs to be different. Probably it does in breast cancer than it is in cardiovascular disease. But there is also exercise nutrition components. Social support is a big part of that as well because it's typically done in groups.

We did a pilot study. Dr. Maura Vitalins was the lead on this. And we did it right here at the clinical research center. Dr. Pete Brubaker an exercise physiologist. And the three of us worked together to bring women in. They came in right now after, within three months post treatment of their first occurrence of breast cancer. And we assessed them at baseline, three, and six months. And they engaged in-- basically we have the Phase 3 cardiac rehab that we still have over here at the clinical research center. And they were just incorporated into that program with some slight modifications. So really what would it look like? And is it feasible to do this? I'm not going to present all of the information from this study other than the physical activity piece which is simply that they did increase their moderate activity. All right. So it significantly increased at three months and six months. And that was by a self-report as well as with an accelerometer so a more objective measure of physical activity. And we saw physical activity. So it is possible. Immediately after their treatment they came in. They were just enveloped into this program with the social support and the assessments. And it did have an impact on their physical activity.

But it sounds great. But if you look at our schema here what I would really just focus on-- so again I said it was a pilot study. And there were 38 women who are deemed to be eligible. But look, almost half of them said, no, thank you. So the great findings that I could show you, slides and slides of really great findings of how physical activity was related to X, Y, and Z, all the things we just talked about, was only in half of the women that potentially could've been enrolled in this program. And those are the really intriguing questions for me are well, why? Why? This is a great program. Why in the world wouldn't they want to come and spend time with us? It was free. You know, all these good things. We have incentives. We'll help them pay for gas. What could it be? And you can see the reasons given by these 17 women. Work, family obligations, time. You know, the number one reason that people in our country, all people give for not engaging in physical activity is much like the reason they give for not doing anything, which is time. Time. As well as our times for offering exercise. So that was eliminating. Some of them, of course, many of them are still working. Our times are very early in the morning or later in the evening. But still they didn't like the times, transportation, or just not interested.

So it led us to think about, OK. And all of our talks over the years about when to do this. And I have always really wanted to push for right away, right after surgery. Why can't we? Right after surgery, during chemotherapy, why can't we just get people moving? And we've had these conversations. And so we've said, all right. Well many times people will say, well, it's just too much. They're overwhelmed and they just might not want to participate. And I said we're in clinic anyway. We always have a student in clinic. She's the one who is over the years. It's a different rotating student every year. They all look the same. Becca back there. There she is right back there. But they all do a great job of collecting data. Why don't we ask about preference? My gosh, what a crazy concept. Actually ask women what they might want. No one's ever thought of that before.

So we did this little study. And because we know one size doesn't fit all for any behavioral lifestyle change, certainly for physical activity. Told this over and over I teach this to my students that we need to tailor our interventions. And maybe we just should ask these women what they want. So we went in and we're still doing this survey. So this is just the preliminary in 44 women. We just kind of got this rolling last year. And we asked them five questions. We asked them more than that, but I'll talk to you about these five questions. We asked about would you be interested period. If no, then all right, we're out of luck right off the bat. We got to do things to get people interested. The timing of the intervention. What kind of the exercise? What mode would you be interested in? Where would you be willing to do it? And if you started to, what do you think would be the barriers for you? What would really be the limiting factors that would get in your way? Part of the problem with asking that upfront is many times you don't know what the barriers are until you actually get started doing it of course. But we wanted to know what they thought would be their barriers.

So for number one, for the interest, is that absolutely the majority of them are interested in two of the questions that we asked them, physical activity intervention or a weight management program. Interested in both of those things. And in terms of the timing of the intervention is that most of them said that they would like to start in a program like this immediately. Are you listening? Immediately post-surgery. That's when they want to start. Right away. As soon as they're done they want to start in getting engaged. That surprises a lot of people. And it's the majority. Trust me on this one. And some of them said, now about 28% so that was about 50 something percent, 58%. I think it was 28% said after all treatment. That's when they would like to start. But most of them said immediately after surgery. So that's a potential thing to percolate and think about. And time of day, morning and evening as many of them have jobs or it doesn't matter. Walking, no surprise. That's the number one preferred mode of activity for all adults.

But what surprised me so far and what excites me is that the second preferred mode is resistance training. That's great news because we know that resistance training is really important. And perhaps it's not important as much for any other population than it is for breast cancer because of the limitations and the shoulder joint and with range of motion and strength. So interested in resistance training and these are the top five modes they were interested in.

They were willing to travel about up to 20 minutes. That is no different than any other chronic disease. We find that if they are more than 30 minutes away from our center, it's a bad omen for adherence. They just don't want to travel that far for good reason. Interesting to me, many said they would do it at home. Many said they would come to a center like our clinical exercise center. But only 60% said they actually wanted to do it at the Cancer Center. And when the students' probe about that and ask a little bit more qualitatively about that, they say, you know, I'm here all the time. It would be really great to get out. And so we think it might be good because they're there. It's convenient. But maybe it's really a positive, healthy changing behavior that they'd actually like to do someplace else. Although we do know from our studies that they like doing it together. They'll say, I don't have interest in going to a support group, but sure I'd love to come and exercise with other women with breast cancer. And sure enough if you walk around the track with them enough times, you'll find that what they're talking about is their-- lots of things-- but of that they also talk about their treatment and their hopes and their fears.

Top three barriers. No surprise, time constraints and fatigue and pain. All right. That's what they thought would be their top barriers. And there were others as well. Upper extremity function, motivation. How many of us would say motivation would be a barrier for participating in physical activity? So it is an ongoing survey. I think it's interesting to see. But the best news is that they're interested. The majority are interested and they want to find out more information.

So how do we incorporate physical activity in the cancer treatment trajectory? Where do we do it? There are lots of things to think about. And these are the same things. I just take this and whatever-- I work in a few different chronic diseases. And I talk to various groups. And this holds across people in terms of changing behavior. We know that these things help us in changing behavior over time. So working with someone, we have to ask them what their intent is. It's not our job to set goals for participants in this kind of behavior. What do they want to do? What does it matter? Why would physical activity be important to them? It's the biggest mistake, number one, in an exercise clinical trial if they come in and we say, we want you to exercise because it's going to increase your function and your X and your Y and your Z and they showed up at your door because they just want to pick up their grandchild again, get on the floor and play. Older adults just coming through here. Or maybe I just want to maintain my work and I think physical activity. You know, you've got to go to the person, find out what their goals are, help them make realistic and meaningful goals. What are their preferences?

So having a type of program where they can choose their modes of activity that they find fun and enjoyable and challenging. Understanding barriers. So if time of day is a barrier, can you have a program that's offered at multiple times of the day? Things like that. If time is a barrier, well we can talk to you all about the guidelines for physical activity. You know, it's no longer no pain, no gain. And it's no longer you have to do it until you drop. 10 minutes is better than nothing. And we can do it incrementally. We can do it in 10 minute bouts and still have really great health benefits. So maybe we can help work through those time constraints and barriers like that. Helping people understand the importance of self-regulation. That's very true in diet. We know that. But it's also true in physical activity. You've got to keep a log of what you do. Hold yourself accountable. Monitor that over time. And social support plays a bit role in all of our interventional trials. But even in our more pragmatic trials out in the community, we have found that social support is an important piece in terms of promoting physical activity behavior.