Becky Campbell: Good afternoon, good morning, and thank you so much for joining our webinar today. I'd like to welcome you to our topic today, which is prostate cancer: survivorship, exercise, and mental health. We have a great panel today who are going to discuss these aspects of survivorship. Now that many patients are living much longer with prostate cancer, these issues of survivorship become all the more important, and there are so many interventions that are available for patients with advanced disease to help them live their best lives as well.

So, I'm going to cover a couple of housekeeping items before we get started. The webinar is being recorded, and we will send you a link to re-watch the presentation if you think you've missed anything.

We received a number of excellent questions in advance, and we'll get to those as we can. And you're also welcome to ask questions using the Q&A function at the bottom of your screen. Please note that we can't provide individual medical advice, so be sure to talk to your healthcare provider for specific information about your healthcare. You can also find other information on pcf.org regarding prostate cancer and diagnosis and treatment.

In case you're not familiar with the Prostate Cancer Foundation, I'm just going to give a brief overview. So, we were founded in 1993 with the mission of reducing death and suffering from prostate cancer. And we do this by funding the most promising research in this area. More than 2,200 projects and counting, and many of the treatments that are used today were actually funded at the earliest stages with PCF funds. And we're continuing to fund research around optimizing diagnosis and treatment, figuring out which patients might respond best to which therapies, as well as survivorship research, like we're going to be talking about today.

We also have a number of resources to empower patients and caregivers as they're making decisions about their care. You can go to pcf.org to find patient guides, view past webinars, recordings, including this recording that will be posted soon. We have online support groups. And I want to just let you know about our next webinar, which is coming up at the end of April on April 30th and the topic is rising PSA after treatment. I'll be putting a link in the chat to register for that webinar.

I'd also like to encourage you to go to prostatecancerpatientvoices.com, and you can see patients and caregivers telling their experiences in their own words through video stories.

I'm also excited to share that we're going to be launching a new pcf.org very soon, this spring, with the aim of improving navigation, just making it so much easier to find the information that you're looking for. So please stay tuned. We'll be sending out some emails with the announcement shortly.

And if you feel moved to support our mission, please feel free to donate at pcf.org. In 2024, we funded more than $34 million in research awards, and we'll be meeting one of our 2023 young investigators today, who is Dr. Phoebe Tsao. And she's going to be speaking more about her research during her segment on mental health.

So without further ado, I'd like to introduce our host, Dr. Phil Koo. He is the Chief of Diagnostic Imaging, and the Physician Executive of Oncology at Banner MD Anderson Cancer Center. He is a nuclear medicine physician, and his research interests include PET imaging in prostate cancer and response to novel therapies using PET imaging.

He is also the Editor of the Imaging Center of Excellence on UroToday, which is a provider-focused education site. And I'm so pleased to have him as our host. So, Dr. Koo, thank you so much, and I'll let you take it from here.

Phillip J. Koo, MD: Great. Thank you so much, Becky, and thank you for putting together this wonderful program, where we're focusing on topics that, you know, often get put to the backside. And mental health and exercise are two really important topics that, I think, not only help improve clinical outcomes, but improve quality life as well.

And we have two wonderful speakers who are experts and also researchers, that donors, gracious donors, such as many of you, have helped support over the past thirty-two years. And it's wonderful to see those dollars actually lead to substantive changes in the journey for our prostate cancer patients.

So first, we have Dr. Phoebe Tsao. She's a research investigator at the VA in Ann Arbor. She's also--that's where she also practices, where she has her clinical practice as well.

Her research interests have focused on depression and anxiety in men receiving androgen receptor signaling inhibitors for prostate cancer, and also the implementation of the collaborative care model in managing cancer-related distress in veterans. And in 2023 she received the Stuart Rahr Foundation PCF VAlor Young Investigator Award.

And then our next speaker is Dr. Christina Dieli-Conwright, who's an Associate Professor of Medicine at Harvard Medical School and Dana-Farber Cancer Institute. Her research interests have focused on development and implementation of novel lifestyle intervention approaches to prevent cancer risk, recurrence, and mortality in the support of healthy living for those affected by cancer. And she's actually received two PCF awards, one in 2021 and one--which was the PCF-Pfizer Health Equity Challenge Award, and in 2022, the Stupski Foundation-PCF Challenge Award.

So, wonderful to have both of them. We're going to start off with our discussions about mental health, and I'll turn it over to Dr. Tsao.

Phoebe Tsao, MD: Hi, everyone! It's great to be here and to share some of my experience, both as a clinician and caring for patients with advanced prostate cancer, especially my clinical practice is at the VA in Ann Arbor, so it's kind of a unique space as well as to share a little bit about my research.

So maybe I'll start with the second piece, and you know, I certainly am looking forward to answering any questions that come up.

But, you know, my research interest is in the—actually, the impact of the treatments that we administer and are really life-saving and life-prolonging for many individuals with prostate cancer. But one of the side effects that can come with it is an impact on mental health.

And it's a unique side effect of the treatments that we give for prostate cancer, because, probably as many of you on the call know, prostate cancer, for the most part, feeds off of testosterone. That's its food. And so, scientists discovered, you know, back in the 1950s that if you could lower an individual's testosterone, you would essentially starve the prostate cancer cells, and the prostate cancer cells would die or kind of go like dormant.

And so, you know, contrary to maybe a lot of other cancers, prostate cancer often doesn't use chemotherapy right up front for its treatment. And instead, the backbone in various stages of prostate cancer involve some form of what we call “androgen deprivation therapy” or lowering of that testosterone. And so that has a unique impact on the mental health of the individuals receiving that treatment probably twofold. You know, one is testosterone, actually directly impacts mood. It crosses into the brain and has some kind of role in controlling how we feel. In fact, actually, for individuals that have really difficult-to-treat depression, men--actually testosterone replacement in the past has historically been used to improve mood. So, we know that testosterone has a direct impact on mood, and I probably don't have to tell many of the individuals on this call. But other side effects that individuals experience with androgen deprivation therapy can certainly impact mood in and of themselves.

So, for example, the fatigue, and Dr. Deili-Conwright will talk more about this, too. But the muscle loss, the hot flashes, the loss of interest in sex, erectile dysfunction, and that whole constellation of symptoms and kind of altering of the individual's identity can also drive depression as well, too.

So that's kind of the background. And we know that ADT has a--increases in individuals' risk for depression. But, you know, there's a host of new treatments that are on the block now for advanced prostate cancer, and kind of moving earlier and earlier in the disease phase of prostate cancer. And all these treatments, some of these treatments called androgen receptor signaling inhibitors, or pathway inhibitors is sometimes what they're called, they all impact the androgen pathway in different ways. And so, we don't really quite--you know, abiraterone is one of these drugs that further suppresses testosterone drugs like enzalutamide, darolutamide, and apalutamide block the uptake of testosterone by the prostate cancer. So kind of hitting these androgen pathway in different ways with these drugs, and so my research interest is really in understanding the impact of those new treatments that have been out now for probably ten to fifteen years on depression and mental health and individuals receiving them. So that's a big, unknown question that I'm passionate about learning more to really inform patients and their loved ones, you know, what to expect and kind of what to weigh and consider as they're making their own personal treatments about their prostate cancer care.

So maybe I'll pause there and see kind of what questions or where we should go from here.

Phillip J. Koo, MD: Great, thank you very, very much. So, you know, let's sort of talk about mental health, and how, sort of why, it's underreported, and what we can do to sort of raise awareness on mental health for patients with prostate cancer.

Phoebe Tsao, MD: Yeah, that's such a great point. I think there's a couple of reasons for that. One is, you know, experiencing depression or anxiety carries such a heavy stigma in our society and in our communities. I think, for men especially, actually, so that may be a big wall, I think, for individuals to share with their healthcare providers what they're struggling with.

And then the second half to that is actually kind of specific to cancer, or to individuals living with cancer often find time my patients feel like, "well, I'm supposed to feel terrible, right? Like I have cancer. I'm receiving these powerful drugs...I think there's the thought of...I should be like, it's expected that I would be suffering or not feeling well."

And without my patients and their loved ones potentially realizing that, you know, there is help. And there are so many different ways that we can optimize an individual's quality of life, so you know, a lot. The cancer community has recognized this quite a bit. And so different organizations, even Medicare and the NCI have advocated for screening, for

mental health symptoms. So we don't put the onus on patients to overcome those walls to let us know. But every patient, when they walk in the door, gets asked about depression.

There's certainly barriers and ways that we can improve that process. But that's one way to try to take the onus off of the patient to have that kind of courage. But even a webinar like this, to just talk about it and bring it out into the open and encourage patients and their loved ones to bring these things up with their providers at their visits.

Phillip J. Koo, MD: So, let's talk about the classes of anti-androgen drugs that we have. So we sort of have two big buckets androgen deprivation therapy. ADT, and then we have, you know, these more novel hormonal agents. Sometimes we call them “androgen receptor pathway inhibitors,” and then, which between each--in each of those categories we have multiple different types of drugs. So let's start off with ADT versus these novel drugs. What types of impacts are we seeing between those two big classes?

Phoebe Tsao, MD: Yeah, it's a great question. So androgen deprivation therapy, which kind of traditionally what it's been called. And men usually receive this as an injection, sometimes with a newer pill called Relugolix. That was just approved a few years ago.

It actually manipulates, like the normal hormone, like communication, we have in our bodies to tell an individual to naturally stop making their own testosterone.

So you know, it actually tanks the testosterone levels in the individual, and that's been around and in use for prostate cancer for many decades like we talked about.

Now, the novel androgen treatments that you mentioned are new on the block, since about 2010. Abiraterone was the first one that came out. And there's two main buckets of how these types of drugs and how they work.

So, one is abiraterone, and that actually blocks the production of testosterone at the building block level. So no matter where it's coming from, because actually prostate cancer can make its own testosterone and feed itself. So telling the individual to stop making their own testosterone is not going to impact that. So that's why Abiraterone was developed to stop it at the building block level. So it does further suppress or alter testosterone.

And the second big bucket of drugs is what we call, you know, the fancy medical term is “androgen receptor antagonists.” So, what they do is they actually don't affect an

individual's testosterone. They stop the prostate cancer from using any testosterone that's around. So that's enzalutamide, apalutamide, and darolutamide.

So they do have--we know that, you know, because ADT has just been around so much longer, that about 10% of men who, you know, start ADT can develop depression or anxiety.

The novel androgen treatments, those pills, abiraterone, enzalutamide apalutamide, and darolutamide are newer on the block, so we don't quite totally grasp their impact on mental health.

One of the hypotheses that I have is that enzalutamide, which crosses up into the brain, is potentially associated with the most depression, based on the fact that it gets up into the brain and blocks androgen signaling in the brain. So we might find that one of these pills is worse than another in terms of causing depression.

And so that's something that my, you know, research is interested in looking at.

Phillip J. Koo, MD: So then, within, you know, the class of ADT, you have agonist, antagonist different formulations, and I'm sure patients are often wondering which one's the best from a mental health perspective. Has there been one that's been proven to be better than the others?

Phoebe Tsao, MD: Oh, that's a good question. The short answer is no, in our experience they're pretty much equally culprits of the side effects, and that's because no matter how they work, the antagonists or the agonists, they all, at the end of the day, lower testosterone. And that's really where this--the association with depression comes from.

That's not true, like we just briefly chatted about, for the novel androgen treatments, the androgen receptor signaling inhibitors. We have a lot more to learn. But we definitely have a hunch that enzalutamide might be the biggest culprit in terms of being associated with depression and brain fog, and even falls and potentially cognitive impairment. So there's a lot of research going on in that area.

And something I certainly want patients to take home is that these novel androgen treatments are often used interchangeably, and doctors choose alongside their patients based on the side effect profiles, actually. And so, if depression is something that a patient has really struggled with, or is very concerned about, that sometimes does tip me, you know, all other things equal, to choose potentially darolutamide or abiraterone.

So just something for providers and also patients to keep in mind as they're kind of navigating their treatment choices

Phillip J. Koo, MD: You know the topic of testosterone replacement therapy comes up very often, and you know, does that cause prostate cancer? Number one, and then number two. You know, what is the role for potentially getting back on testosterone for certain patients, you know, along their prostate cancer journeys?

Phoebe Tsao, MD: Yeah, it's a great question. And I think there's a lot. There's individuals with more research expertise in this area. But from my experience as a clinician, I'm usually caring for individuals who have advanced prostate cancer.

So individuals with metastatic prostate cancer or stage 4 prostate cancer. For most of them we anticipate that they would be on ADT lifelong. So unfortunately, testosterone replacement is not really part of their treatment plan, but certainly we support them in many other ways, both in their physical and mental health.

But with that, said, I do factor in, you know, not only the risk between ADT and depression, but also ADT's other side effects.

I do weigh that very strongly when making treatment choices, because there's other stages of prostate cancer, like biochemical recurrence or kind of less aggressive forms of advanced disease, where we can think about taking treatment breaks, or even just watching for now, and not being treated for a time being, and mental health does come into play in that conversation, because for most individuals, when you stop the ADT over time, that testosterone will recover on its own. So I don't usually prescribe testosterone replacement as a drug. But we stop the ADT and allow that person's testosterone to recover.

So that does play into my decision making, you know, weighing the pros and cons of treatment and mental health, is certainly one of those factors.

Phillip J. Koo, MD: So, you know, we know about the impact that, you know, a diagnosis of prostate cancer has, the disease has, the various treatments have, on mental health. What advice do you have for patients who are--well, number one, what are some signs or symptoms that you might see, or caregivers or partners might see? And then what interventions do you recommend?

Phoebe Tsao, MD: Yeah, that's a great question. So the symptoms, you know, associated with depression for individuals with cancer are often symptoms of depression that individuals without cancer can experience. We do know that individuals with cancer sometimes have some unique--I shouldn't say unique. But, like, kind of a different like, different symptoms of depression are more common for individuals with cancer than those without. So, for example, individuals without cancer, part of depression is this feeling of like worthlessness or guilt that's often less common in individuals with cancer. Individuals with cancer often more likely experience, like, finding nothing enjoyable or a lack of joy, and that can often relate to the side effects of cancer treatments and cancer itself, too.

So some things to watch out for are, you know, sleeping more and more like, lacking motivation to do their everyday things, you know, more serious symptoms would include thoughts of hurting oneself or hurting others.

And for some it can be so significant they're not able to take care of themselves or do their everyday things. And so those are some of the symptoms to watch out for, even like just sadness and a feeling of being depressed.

Cancer--individuals with cancer also experience anxiety on the flip side. So I think there was a question actually mentioned earlier about anxiety surrounding PSA results, waiting in the office for those. There's even, in the cancer world, a term “scanxiety,” like anxiety surrounding every time they get scan--an individual gets scans to see the status of their cancer.

So there's a lot of facets, you know. I think that can come with it. But the biggest takeaway, I think, is symptoms from a depression or anxiety standpoint that are impacting an individual's ability to function, to be themselves, to be who they want to be for themselves and for the people around them.

And I think in terms of things that we can do or interventions in this realm there's many, and they range from the simple to like the complex. So on the simple side, and Dr. Dieli-Conwright is going to talk a lot more about this. But exercise is huge and can really impact sexual function and mood positively for men with prostate cancer.

You know, therapy is a cornerstone to treatment as well, too, and some--for some individuals, medications for depression and anxiety can be used as well. Other things that have been studied are even like massage therapy has been shown to be beneficial for men with prostate cancer struggling with depression, and all the things that are good for your body, you know, getting enough sleep, eating a healthy diet. All of these can impact mood as well

Phillip J. Koo, MD: You know, there's a lot of interplay between sexual health, mental health. And obviously the impact prostate cancer and the therapies have on that. Can you talk a little bit about sexual health and some pearls, some wisdom that you have in that space?

Phoebe Tsao, MD: Yeah, yes, this is a huge part of life for individuals with prostate cancer.

You know, my surgical colleagues, the urologists, you know, on their side of things and radiation colleagues, they always think a lot about sexual function related to their treatments.

From my side as a medical oncologist, using drugs to treat cancer, you know, lowering of the testosterone absolutely impacts and lowers an individual's interest in sex and also erectile dysfunction as well, too. And so this can be really, you know, can really impact an individual. And, of course, you know, their loved ones.

So the first thing I always recommend is like, don't be afraid to bring it up. I actually think, doctors, we are not good at--we know that this is a side effect, but I think we're still learning how to talk about it and make sure that we bring it up. And so I actually had a patient bring it up with me, you know, just a couple weeks ago, and that really encouraged me to focus on this more, even in our litany of things that we have to cover at our visits, so don't be afraid to bring it up absolutely.

And there can--and there are treatments. There was actually just a research study that came out this week that showed exercise improved erectile dysfunction in men receiving ADT with prostate cancer.

So exercise can be a cornerstone to this. And then for men where I think, you know, the ADT really, just biochemically makes sex very challenging. And this has been true for one of my patients. Actually couples therapy, or even individual therapy, can be very helpful. My patient and his partner are exploring, like, other ways and other expressions of intimacy, and have found that really really beneficial.

You know, medications can be used for erectile dysfunction, and actually our urology colleagues, our surgeons, have interventions from their standpoint that can help with erectile dysfunction as well, too. So we certainly have a toolbox of treatments for this very important part that can be impacted by prostate cancer, part of life that could be impacted by prostate cancer.

Phillip J. Koo, MD: You know, those are a lot of great points, and you know, I think we need to do a lot better on the healthcare side, provider side, on these topics, and you know, if we don't feel comfortable bringing it up, how are the patients going to feel comfortable? I think there's a lot of work there and then. I think patients, too, shouldn't feel scared or embarrassed to ask these questions directly.

Phoebe Tsao, MD: Yes.

Phillip J. Koo, MD: As well, and being your best advocate. So, just final question, what advice do you have? For you know, spouses, partners, the caregivers, the people around, you know, the patient who obviously can see things differently, and how you sort of navigate those relationships?

Phoebe Tsao, MD: Oh, yeah, for sure. And I think someone had brought this up earlier. One of the questions about how caregivers and loved ones play a role in this, you know, I think the first thing is for my advice, for caregivers and loved ones, is one to learn a lot about the disease. And Becky mentioned, you know, PCF's resources, but and I think that sort of information empowers a loved one or caregiver to have, like, a well of empathy and understanding for what their loved one, you know, might be going through.

And then, you know, a lot of the interventions for depression, for individuals, are things that loved ones and caregivers can engage in, exercise, making sure sleep is adequate, healthy diets. You know, mindfulness, or like gratefulness practices. Those are things that you could do together.

And I think for caregivers and loved ones, another way to advocate is to help identify resources, so advocating for their loved one who's the patient with their provider or their doctor, as we talked about, you know, checking out these websites or resources.

And then, I think, you know, being a--there's a lot of research in the caregiver space for individuals with cancer. And we know that it's hard to be--being a caregiver and a loved watching someone that you love go through a cancer journey. But I think, taking care. The caregiver, taking care of themself is also really critical.

You know, when you're resourced, you're in a better place to be a caregiver and to ask for your own help, and we didn't get a chance to touch on this, but I think peer support for both individuals and caregivers. Be that a cancer support group in person or online.

Even in the waiting room. And you know I work at the VA. So a lot of the patients already have something in common, and often, you know, meet in the waiting room, or just even in the infusion center. So I think having a community is also very important for both patients and their loved.

Phillip J. Koo, MD: Wonderful, so many insights. And you know, I think it's very clear that prostate cancer, the treatments, the anxiety around the whole journey creates many issues when it comes to mental health.

I guess the good news is, there are some interventions, as you discussed upon, and now we're going to sort of dive deeper into the idea of exercise, and we're going to shift gears and turn it over to Dr. Dieli-Conwright to talk about exercise, and how we can use that as a way to help deal with some of the challenges of patients with pro--that patients with prostate cancer go through. So thank you very much, and welcome, Dr. Dieli-Conwright.

Christina Dieli-Conwright, PhD: Thank you, all. Good afternoon, everyone. I'm really excited to be here. I actually have some slides that I'm going to share, just to give an overview of what I like to refer to as “exercise medicine,” and how that can actually enhance prostate cancer survivorship. So bear with me. I'm just going to pull up some slides here.

Will you all be able to see this very quickly? Not too long, because I know there's some really exciting questions in the chat, which is great, and that we got in advance. So just to give you a little bit of background, my research focuses on exercise oncology. This may be a new term to some of you, perhaps not to others. Exercise oncology is a form of exercise research that specifically looks at utilizing exercise or physical fitness to enhance the lives of people diagnosed with cancer, or even those at risk of developing cancer. So my background is in exercise physiology, and many years ago, I decided to focus my research lab on how we can use exercise to actually improve cancer survivorship. And even in individuals at high risk for developing cancer. So in addition, as you've already heard today, and you're already aware of, there's many benefits of exercise specifically for prostate cancer survivors. So I like to use this slide to hit on those, as you can see, going clockwise. Exercise can reduce cancer, related fatigue, improve joint range of motion, potentially improve treatment, tolerance, improve muscle, condition, or muscle strength, can increase and maintain bone density, reverse physical deconditioning, in other words, get somebody in shape, increase chance of survival, improve quality of life, reduce cancer, recurrence, improve balance and pelvic floor function, improve immune function, potentially improve efficacy of treatment, restore aerobic capacity, or one's ability to do aerobic exercise,

improve mood and sense of self-control or sense of control, and reduce “chemo brain,” or, in other words, improve cognition and memory.

The two items where you see the gold asterisk have minimal evidence to date, the number of clinical trials going on to determine if exercise and many different diagnoses can actually improve treatment, tolerance and treatment efficacy. So those are areas where we still need additional research to fill those gaps. But as you can see, this covers many different physiologic body systems, many that are impacted directly by androgen deprivation therapy or radiation therapy, chemotherapy, etc.

So we can think of exercise as a supportive care mechanism for individuals diagnosed with cancer. And it's critically important in individuals diagnosed with prostate cancer. Again, given the different side effects of treatments, such as androgen deprivation therapy and radiation therapy, specifically with toxicities to the skeletal muscular system due to the lack of testosterone and other androgens that would help stimulate bone and muscle mass are critical components to keep in mind. And so I wanted to share my sort of two minute elevator pitch, as I like to offer it, before we go into Q&A with Dr. Koo, and one is that the exercise guidelines include 150 min of moderate or 75 min of vigorous aerobic exercise per week plus two resistance exercise sessions. Those are great guidelines to follow, if you have the time and the resources to do so.

Another way to cut those are doing 30 min of moderate intensity, aerobic exercise per day. Moderate intensity is where you can barely talk while you're actually exercising, so you should be out of breath. Your heart rate should be elevated. However, don't forget the two sessions of resistance exercise, hitting on all the major muscle groups in the body. Next piece of advice - reduce sedentary behavior. Move more, sit less. If you're sitting now to participate in this webinar, feel free to stand up, march in place.

Stand up and sit back down repeatedly. Getting those small doses of movement are really, really helpful. Last two pieces of advice. Consistency is very key. Try to pick something that you enjoy, that you're going to be consistent at for very long period of time, many months, many weeks, etc. And that's where you really start to feel the benefits and remember that motivation is personal. Have to find some type of exercise that you really enjoy engaging into in in a setting that's going to enhance engagement. Walking a dog, playing golf, Boston Marathon’s coming up in a few weeks. Perhaps that's of interest to some people--group exercise. But again, for any of those who are sitting a lot, maybe doing a lot of zoom or remote type of work or remote activities. It's going to be really important to move throughout the day.

And on that note, I did want to just put up my email in case anybody has specific questions that they'd like to reach out to me for. But I would look forward to having a discussion with Dr. Koo and to taking questions.

Phillip J. Koo, MD: Great. Thank you very much. So, let's sort of step back. And, what is it about exercise? You know, physiologically, that that helps?

Christina Dieli-Conwright, PhD: Yeah, absolutely. So there's so many different physiologic systems that exercise can actually help. So maybe we'll start with, maybe we'll focus on the cardiovascular system and the musculoskeletal system, you know. Think of the body as a luxury car, if you will. Right, we need to train it. We need to take care of the engine, get those oil changes and things like that. And so when we're participating in aerobic exercise, we're increasing blood flow to different parts of the body that are exercising, and that increased blood perfusion is going to help move healthy cells around the body, such as the immune system, inflammatory cells, glucose, etc. It's also going to help the heart get pumping at a higher rate. Heart is a muscle - needs to be trained as well, so it can help to strengthen the heart. And when we're strengthening the heart, increasing that blood flow, it's really helping to refine how our cardiorespiratory system is going to function on a daily basis.

People will feel that output by, let's say, for example, not feeling as out of breath by taking a flight of stairs or not feeling as fatigued when they're doing activities of daily living such as household chores.

Maybe their typical exercise programming becomes a little bit easier as they get more fit. So we can train the cardiovascular system very efficiently with exercise. Muscle is going to respond the same way with resistance exercise.

When we contract the muscle, we're able to stimulate or start to kick, start various mechanisms inside of the muscle that are going to help us to regulate things like glucose. Obviously help the muscle get stronger. You sort of hear that adage of no pain, no gain. That's because typically with resistance exercise, the muscle actually tears a little bit, and then it repairs, and when it repairs it actually gets stronger.

You'll see this a lot with larger muscle growth, with bodybuilding or with heavy weightlifting. That is actually what is happening. How those muscles are building back, getting stronger and larger is because they're tearing a bit, and then they're rebuilding themselves. So you combine those two types of exercise, aerobic and resistance exercise. From my opinion you're going to get more bang for your buck.

You're going to get stronger heart and lung system capacity. And you're also going to get stronger muscles, and those together are going to support increased function, mobility, easier ease, at which one can carry out activities of daily living and just overall general health.

Phillip J. Koo, MD: Alright. So from--for those who maybe have a certain level of exercise already part of their lifestyle. Do you recommend they increase it? Or is it okay to sort of maintain that level? Or should you be just constantly pushing yourself to do more and more?

Christina Dieli-Conwright, PhD: From the volume perspective, more doesn't always have to mean better. However, the body is pretty smart, and it's going to start to outsmart what it does. So, in other words, it's good to change things up and to make small modifications in the exercise programming. If you're already exercised consistently, and you have a set program, It's good to change it up about every 6 to 8 weeks.

That could be anything from making it a little bit harder, like getting the heart rate up a little bit higher, changing the number of reps you do with, let's say, squats, changing the load, changing the modality of aerobic exercise. Maybe, instead of cycling, you move to something like rowing. Just continue to keep the body guessing, if you will, because it's going to adapt to exercise when there's consistency.

And then when it does so, it might start to plateau where those benefits start to taper off a little bit, and then you need to kick start it and change things again.

Phillip J. Koo, MD: That's interesting. I like that. And I think that variety probably keeps it more interesting as well. And there's so many different options out there - pilates, yoga, weightlifting, and whatnot. So that's great advice.

So a lot of discussion about sarcopenia sort of online and whatnot. And as you grow older you lose muscle mass. What's your take on sarcopenia? And just some words of advice there with resistance, training?

Christina Dieli-Conwright, PhD: Yeah, my take on sarcopenia is that we need to work consistently to maintain the muscle mass that we do have. Surprisingly, we build peak

muscle mass around the same time we build peak bone mass, which is like mid to late twenties.

From there, we're trying to keep as much of it as we can right? And so participating in exercises that are going to keep the muscles stimulated, keep them strong.

You could even potentially build muscle mass, is going to be critically important and even more so when androgen deprivation therapy is prescribed, especially chronically. So it's really important to engage in resistance exercise regularly two to three times per week. The challenge with resistance exercise is such that, resources right? So it's not like putting on a pair of running shoes and going out for a walk, or jog, or hiking, you might need some equipment. You may not, could do some body weight resistance exercises that are very effective. But if those do start to feel easy, might need to think about some dumbbells and kettlebells. If those are even easier, you have to think about, “hat resources do I need to continue to stimulate my muscle?”

This is a little bit of oversharing. But I do get asked this quite a bit. If I had to pick between aerobic or resistance exercise, which one would I pick, and I would pick resistance exercise, especially in the context of prostate cancer. For a couple of reasons. First of all, you're going to be able to train your muscles adequately with resistance exercise that you may not be able to do with aerobic exercise. Second of all, you can also participate in resistance exercise where you are actually getting out of breath. And it's--it becomes more taxing on the aerobic system.

So you're getting a little bit more of that bang for that buck. You see, types of commercial programming like this, like things like Crossfit, F45 boot camp style, where there's weights integrated in a circuit fashion to get your heart rate up, etc. But it's critically important. Sarcopenia is a real problem. When you lose muscle strength and you lose muscle mass, you're going to lose mobility, and balance, and function, and that's going to affect gait, speed, gait, speed is very strongly correlated with risk of mortality. So from my perspective, it is really critically important to integrate resistance, exercise throughout the lifetime

Phillip J. Koo, MD: I think that's a great take home point. I think sometimes we forget about that resistance. And you know, pushing yourself with those weights, I think, does help. So let's sort of go along the whole journey of someone who might have prostate cancer from beginning diagnosis to advanced disease. And we'll sort of talk about exercise. So you get diagnosed with prostate cancer. We hear a term called “rehabilitation,” or getting yourself in tune before surgery or radiation. What's your thoughts there, and what can patients do to sort of get them in the best possible state before that treatment?

Christina Dieli-Conwright, PhD: Yeah, that's excellent. Prehabilitation is fantastic. It is exactly that, it's priming your body to undergo these more harsh treatments that might impact fitness and function negatively. And so the more-this might sound a little adverse-but the more you can squeeze in and train consistently, exercise consistently, prior to starting radiation therapy or surgery, etc. the better the recovery is going to be. There is evidence to show that prehabilitation exercise is going to reduce hospital stays, reduce infections, and complications. It also is going to help sustain pelvic floor function on the rehabilitation side of different types of pelvic surgeries. Incontinence can also be managed and improved, etc. And so it really is critical in some capacities. What I try to suggest is not to overthink too much about the nitty gritty of what should be done in a prehabilitative setting. It's more, be consistent and get it in. We have some studies going on now where individuals are exercising four to five times a week, and about a four to five week span before going into surgery, to really help load up and get them as fit as they can before they go into some of these treatments. So I'm a huge proponent of rehabilitation, but I will not understate that it is a very hectic time, right? So it going, getting everything else under wraps, organized, etc. prior to some of these major surgeries and treatments can be overwhelming in itself, thinking about adding in exercise, or just continuing to exercise when a time burden might be present, is a very real issue.

And so trying to just squeeze in whatever any individual can leading up to that surgery, or that treatment is better than nothing.

Phillip J. Koo, MD: So then, okay, that's wonderful advice. You get treated, many patients will receive androgen deprivation therapy, you know, one type or another. Clearly we heard the effects it has on mental health makes you feel fatigued, tired, depressed. What words of advice do you have for those patients sort of in that space?

Christina Dieli-Conwright, PhD: Don't get discouraged. I've met many, many men throughout many of our trials who just can't seem to tinker with exercise enough to get the benefit that they want. We have to keep in mind that as all of us age, we're losing muscle. We're losing the hormonal environment that supports muscle and fitness. We may not be able to exercise as hard as we used to, and get the same benefit or exercise as little as we used to, and get the same benefit, so my advice would be to keep at it. If you're already doing it, because it's going to be, you're going to be much better off than not doing it at all. You might have to switch things up even more regularly, like every four weeks, to just keep

the body stimulated. If you have the ability to consult with an exercise professional, that's always going to be an excellent resource. But I would caution, likely prefer to go with individuals who are accustomed to working with clinical populations. Even better if they've worked with cancer survivors before.

And you know, just don't be discouraged if you don't see the immediate or even long term benefits that you had hoped to, because we're sort of working against, we're in an uphill battle right between the normal aging process and then potentially the adverse side effects of ADT and other prostate cancer-related treatments. There's a lot of gains to be had, and they just may not come as quick as we want them to

Phillip J. Koo, MD: So you know, that was really good advice in terms of, you know, trainers help, but try to find someone who's maybe a little bit more familiar with I guess the disease state. And ideally, you know, cancer, if available.

So let's fast forward a little, and, you know, we know prostate cancer is a disease of the bones. Unfortunately, it metastasizes the bones, and that creates a lot of concerns with regards to exercise that maybe it'll lead to a fracture or whatnot. Or “maybe I should avoid certain activities to avoid potentially get getting a fracture.” What advice do you have for those patients more in that advanced space?

Christina Dieli-Conwright, PhD: Yes, I mean, the first step is certainly receiving clearance from the medical oncologist that it's safe to exercise. You know, even as an exercise physiologist working with this patient population every day, we will not enroll any patient in the trial without getting the medical blessing of the medical oncologist. Then it's going to be really important to think about where those lesions are. What type of pain is present.

Exercise is safe for individuals with bone metastases, absolutely. But you have to be really in tune with the symptoms and making sure that the exercise isn't causing any additional bone pain or uncovering potentially any new lesions per se. For example, if we're thinking about, maybe lesions in the femur or the vertebrae, there are certain exercises you just want to work more slowly with and be very cautious with. If one's going to squat or do any type of leg exercises, you just want to proceed really safely and carefully.

Maybe starting at a lower intensity, and just keeping an eye on the symptoms and being aware of how the body is changing or responding to that exercise. But it's absolutely okay to exercise when bone mets are present or even metastases in general. And it's really just, you know, potentially, even keeping sort of a symptom diary of where those symptoms are. So

that way, if something changes with exercise, you'll be able to really discern how you need to kind of scale back on the exercise or not, and really having making sure to check in with the physician about integrating exercise into the daily routine. And what types of exercise, but it's absolutely safe.

Phillip J. Koo, MD: So you know, you've been a leader with regards to clinical trials, and really trying to study and find answers to a lot of these questions, what advice do you have for patients who might be interested, or who are unfamiliar with clinical trials, particularly in this space?

Christina Dieli-Conwright, PhD: Absolutely, great question. So there's--all clinical trials in the United States are publicly available on a website called clinicaltrials.gov. and you can enter in search terms in that trial, almost just like Google, where you can look for exercise and prostate cancer and try to locate clinical trials in one's area where they reside to see if there's any studies that are ongoing that are closer. Of course we have studies here in the Boston area that do require some type of travel to Boston at this current present time, but we do a lot of our exercise interventions virtual where we send the equipment to individuals. And there's other research labs across the country that do something similar. And so clinicaltrials.gov is an exercise, an excellent resource, and I see that was just put into the chat. And it's a great way to start. Other resources could be looking at the website of a cancer center near you, where they often do post clinical trials and sifting through. That can also be a great way to go about that as well. And simply a plain Google search might even help, “exercise trial for prostate cancer in Los Angeles” might be a good way to find something nearby, etc.

Phillip J. Koo, MD: So you know, as someone who's really searching for answers to a lot of these hard questions, what would you say are the top one or two questions that you'd like to answer, that you're working on that can help sort of us keep moving forward when it comes to exercise and prostate?

Christina Dieli-Conwright, PhD: Sure. we have two burning questions that were on my mind, and thankfully, thanks to the Prostate Cancer Foundation, I was able to initiate answering those research questions. And there's two trials we have underway. As a result, one is using exercise to offset cardiovascular disease risk in Black men with prostate

cancer. So there's very apparent health disparities in Black men with prostate cancer. At the time that we wrote our grant to the PCF, there was only one other exercise oncology trial for Black men with prostate cancer out of hundreds of hundreds of trials for prostate cancer. So we're really excited about that trial. We call it the POWER trial. It is currently enrolling where we're actually almost 90% done and we do supervised virtual aerobic and resistance exercise to target cardiovascular disease risk in that population. The second other burning question that I had is, how can exercise, specifically resistance, exercise, impact skeletal muscle growth in individuals with metastatic prostate cancer. So thankfully, again, to the Prostate Cancer Foundation and our Challenge Award, we're actually looking at that as we speak, we have the FIERCE trial undergoing at Dana-Farber.

And we actually do muscle biopsies in individuals before and after exercise that have been diagnosed with metastatic prostate cancer. And we're looking at the same metabolic pathways, or, I should say, the anabolic pathways that build muscle and see if they're different, how they respond to resistance. Exercise in this patient population, and also how that interplays with sarcopenia and frailty. So those were my burning questions that I'm really grateful to have the opportunity to explore, thanks to the PCF.

Phillip J. Koo, MD: Great. Thank you. So let's invite Dr. Tsao back. And and one topic I wanted to talk about was sleep. And this is a question that's come up a few times in our chat. Obviously, sleep is going to be affected, mental health affects sleep. Exercise might be able to help with sleep. So maybe I'll start with you, Phoebe, and then I'll turn it over to you, Christina.

Phoebe Tsao, MD: Yeah, it's a good question. I was looking through some of the questions in the chat. And you know, individuals with prostate cancer have so many reasons to not sleep well and that can be a challenge. And one actually, that one of the individuals in the Q And A brought up, was hot flashes. So actually, sometimes addressing the hot flashes, could help with sleep from that regard and kind of, everything can, you know--sleep impacts mental health, certainly.

So that would be one thing. And then, like also in my clinic, a lot of times like frequent urination, and getting up in the middle of night to pee can also impact sleep and subsequently mental health. So sometimes we try to tackle that. And along with our urology colleagues, there is, you know, it's not specific to individuals with cancer. But you know, I think the arrow can point the other way, too. I think if you're staying up at night worrying about the cancer, worrying about the treatment, that can impact your sleep as

well, too. So sometimes tackling the mental health and the anxiety piece, especially through different forms of therapy, can be very helpful.

And you know, for those who struggle with insomnia, even without cancer, “cognitive behavioral therapy I” it's called “CBTi” is a very tried and true therapy to help individuals with sleep, so just things that folks can bring up with their providers, for sure.

Phillip J. Koo, MD: Great. Thank you, Dr. Dieli-Conwright, your thoughts?

Christina Dieli-Conwright, PhD: Yeah, we, we have some pretty sufficient evidence that exercise improves sleep quality. That's that. And I say, specifically, sleep quality, because it's a pretty easy measure for us to assess. Sleep can actually be a really complicated domain to measure in a research setting, right? It's typically done by self report of some type of questionnaire. And so we've been able to pretty efficiently get at that by using a sleep quality questionnaire where they're not just sleeping more. But it's of a high quality where they actually feel like they're rested.

We think the mechanism behind that, logically, would be that if you're exercising, you need to sleep to recover, and perhaps it might help with a better night's rest, if you're tired from putting your body through some type of exercise modality. That's not always true. I think there's other factors that can interfere with that, such as other hobbies that might interfere with sleep. But the general thought is that exercise across the board is going to help with sleep quality.

Phillip J. Koo, MD: Great. You know, an interesting question comes up with regards to exercise and bike riding. And you know, Phoebe, I'm sure you've seen this often where it maybe causes a rise in PSA or whatnot. I remember with Lance Armstrong, granted t wasn't prostate, but you know there were questions on, you know. Hit--time on bike, whatnot. Phoebe, what are your thoughts on bike riding?

Phoebe Tsao, MD: I'd be curious what Christina has to say, too. From a medical oncology standpoint for my patients with advanced prostate cancer, you know, it's not going to impact their PSA substantially enough that--and plus, we, in general,don't make any treatment decisions based on a single PSA alone. So if bike riding is what you love,

It's how you can get your body moving, it's a way to connect with family and friends, get outside. Like I think the pros far, far, far away, you know, arguably, for my advanced prostate cancer patients like zero cons.

We do--it does come up more in primary care clinics for individuals who are undergoing PSA screening to detect prostate cancer, as sometimes, you know, if they went for a 40 mile bike ride or something, and that prostate's been compressed and a little inflamed, and even if the patient doesn't experience any symptoms, it might falsely elevate a screening PSA. But for individuals who already have prostate cancer, you know, I would say, absolutely go for it, especially if it's something that you enjoy.

Phillip J. Koo, MD: Great, and Dr. Dieli-Conwright, your thoughts?

Christina Dieli-Conwright, PhD: I would, yeah, I would agree. I would agree. I mean, certainly on an individual basis. If there is discomfort, then I would certainly consult a physician for that. I think I read a question at some point this afternoon about a recumbent bike, which is more seated, and the feet are more extended straight. That could be a way to alleviate any discomfort if that is present. The bigger issue is that often bike seats are just uncomfortable, anyway. So that might be a bigger deterrent.

Phillip J. Koo, MD: Yes, I I agree with that. So we're going to--we have five minutes left. Just some last key takeaways from both of you. Dr. Tsao, I'll start with you.

Phoebe Tsao, MD: Yeah, absolutely. Well, just super, a huge thank you to the Prostate Cancer Foundation, I think, for supporting both Dr. Dieli-Conwright and me and our kind of mission to help men with prostate cancer live not only as long as they can, but as well as they can.

And I think for me from a mental health standpoint, the two takeaways are, you know, one, I think, for individuals to even be aware that depression and anxiety can be associated with ADT.

Sometimes that's not like the most common side effect that we often think about. So just even having that awareness out there, and then for patients to bring that up with their providers absolutely, and depending on your prostate cancer situation, whether taking a treatment holiday even, it comes up in my conversations whether to start ADT even to begin

with. And then for those who are on more advanced, you know, antiandrogen therapy like abiraterone, enzalutamide, etc, sometimes switching the ARSI could be helpful. So just for individuals with prostate cancer on those treatments to know if they're running into depression, to absolutely bring it up with their providers, and it's not something that we expect you to feel and anticipate you having to live with. And so the last takeaway, I would say, is definitely to ask for help. You know, there's so much out there. There's a lot of work that needs to be done in this space. I think there's some insurance questions that came up in the Q and A.

There's so much work that we still need to do to improve mental health care, you know, in general, and access to it. But as we're, you know, doing that work, just absolutely asking for help and reaching out so you can get connected.

Phillip J. Koo, MD: Great. Thank you, Dr. Dieli-Conwright?

Christina Dieli-Conwright, PhD: Yeah, you know, a few last messages would be that exercise is safe throughout the entire prostate cancer journey all the way from prehabilitation during treatment. Both chemotherapy, and radiation therapy, all the way into whether there's metastases present, perhaps even palliative care. So don't hesitate to sort of try new things. Exercise is a journey.

It can be a very personal journey, based off of preferences and motivation. Don't give up, don't be discouraged, and just remember to move more and sit less. We're a very sedentary nation.

And so even just taking small breaks throughout the day from a typical sedentary behavior is going to go a really long way.

Phillip J. Koo, MD: Yeah, those are great words of advice. So, I want to thank PCF for hosting this wonderful event. I want to thank our two speakers, Dr.Tsao and Dr. Dieli-Conwright. Wonderful to, you know, hear your insights onto these--about these important topics. And lastly, I want to thank all the participants. We have hundreds of you on the call today who took time to learn more about these topics that maybe are a little, what we often call, sort of “peripheral.” But they're not. They're really important core pieces for the prostate cancer journey. And I guess my one request for all of you is talk about it. Talk about mental health and exercise with your network, with your friends, whoever it might be, because we need

more visibility and discussions about this to really continue making a difference. So thank you all for your continued support.

And hopefully, we'll see many of you next time, April 30th, where we're going to talk about the dreaded rising PSA, so hopefully, we'll see all of you next month. Thank you very much.