Dr Pat Camp (00:00):

On today's episode. I'm so pleased to welcome my friend and colleague Kristen Campbell to the show. This is our first interview episode. Dr. Campbell is a professor in the department of physical therapy at the university of British Columbia. And she's also an investigator in the BC Cancer Agency Survivorship Research Center, as well as the interdisciplinary oncology program, and at Providence Healthcare and Vancouver Coastal Health. Her areas of methodological expertise include randomized control trials, exercise testing, exercise prescription for individuals with cancer and other chronic diseases and biomarkers. Welcome to the Lungfit podcast. Kristen,

Dr Kristen Campbell (00:45):

Thanks so much for having me Pat.

Dr Pat Camp (00:48):

So as I know you and I have had conversations about exercise and lung cancer, and we are now even collaborating on a project related to that topic. And in pulmonary rehab, we typically see patients with chronic lung diseases such as COPD or pulmonary fibrosis, but many of those patients actually come to us with a previous diagnosis of cancer. And I thought it'd be helpful to hear the latest science on understanding how a past diagnosis of cancer can affect exercise performance. And also, you know, as you know, there aren't too many lung cancer rehab programs out there. And so many patients are actually referring these patients to pulmonary rehab so it would be helpful to learn more about providing rehab care to these patients. But before we get into the topic of cancer and pulmonary rehab, could you give us an overview of your current research program and some of the studies that you currently have underway?

Dr Kristen Campbell (01:43):

Yeah. So what basically for exercise and cancer rehab, there's been an establishment that it's safe, that people can exercise during it after their cancer treatment. And it generally improves quality of life, feelings of wellbeing and, and cancer related fatigue potentially. So where the research is going and where I spend my time now is try to understand what type or dose of exercise can impact cancer-related side effects or symptoms. So do we, we know that exercise in general is good, but you know, how much of aerobic activity can actually reduce cancer related fatigue at different time points along the trajectory or chemo brain or, you know, cancer related cognitive changes. So while there's a lot of research that exercise should improve cognitive function in older adults, can exercise actually help with that symptom that's common with around chemotherapy? And so we're testing, you know, does exercise actually help that side effect?

Dr Kristen Campbell (02:40):

And then there's a lot of interest. Well, pulmonary rehab is quite established as an entity. Cancer rehab or cancer exercise is fairly new in the clinical world, sort of only the last 20 years. And so we spend some time trying to think about how do we design programming that could actually be easily integrated into the oncology clinical pathway. So it could be a sustainable program such as pulmonary rehab. So we spent a lot of time trying to package different interventions for a particular cancer groups. So we are doing a project in women that are on long-term hormonal therapy, which is very common for breast cancer. If it's estrogen receptor positive tumor then people take these anti-estrogens after their chemotherapy and radiation for up to five or 10 years. And there's a lot of biologists that are throughout. So we're trying to package a program that could be specifically for that group, for example.

Dr Kristen Campbell (03:32):

And the last piece is obviously like everyone in the post COVID era, virtual supervised exercise. So one of the challenges of cancer rehab, and that may be similar for pulmonary rehab, is actually getting people to a program is half the battle because people have, you know, if they're on cancer treatments, they're quite fatigued, they're immunocompromised, there's a lot of complexity about getting people there and we've always been interested in what home-based exercise could do, but all the research and literature show that supervised activity had better improvements of quality of life, of fatigue, of physical function. And so this COVID experience, I think, has allowed us to think about how we could take the supervised piece and try and implement it in the virtual setting to get the same benefits while still being a lower barrier access with patients, maybe at home, being able to engage in it. So that's the kind of stuff we're doing- efficacy work, thinking about implementation, which is new for our lab, and then tackling the virtual exercise world.

Dr Pat Camp (04:31):

It's so interesting that the number or the, the amount of resources that have been dedicated to cancer research over the decades, that the rehab side of it is been a little bit slow to get going. And so what do you think those barriers have been that have really stopped rehab as being a major player in cancer treatment?

Dr Kristen Campbell (04:53):

Yeah, it's an interesting question to understand the history here. And I think for a long time, the focus of the clinicians was saving people's lives. Like this is an acute episode that can have you know, high mortality depending on the types of cancer. And so the focus was, this is a treatment that will keep you alive and yes, it has many side effects and that's, that's just how it is. Like these are the treatments, this is what works. And so I, you know, I think there's nothing wrong with that gets punished for doing what they thought they were doing best. And what were the exercise piece really came from where cancer rehab was really driven by the patients themselves. So people were going back to their clinician asking like, well, I used to run marathons, which I do now, or I've heard that, you know, maybe going out for a walk would be a good thing, is that safe?

Dr Kristen Campbell (05:37):

And the clinicians had no idea because they just hadn't, you know, ever had those conversations. And so it was interesting that it was driven by patients themselves really asking questions. And so the early research was from the exercise psychology world. So all the research was focusing on decreasing anxiety and depression and feelings of wellbeing and the exercise physiology, which is sort of my more of my background, didn't come in until the mid to late nineties trying to understand well, if people are anemic or have low red blood cells because of their cancer treatments, because fast dividing cells are being taken up by chemotherapy and your bone marrow is one of them, well, should we see the same changes in aerobic fitness with exercise. If people aren't getting the benefit of improved red blood cell mass and things like that. So I think that's just, that just wasn't a priority. And unfortunately, the PT element, like the musculoskeletal changes and things like that, that also was sort of neglected as well, which is unfortunate because after surgeries, people do have shoulder limitations after breast cancer surgery and things like that. So that's, that's my interpretation anyway, where we, where we've gotten to and why, why we are, where we are,

Dr Pat Camp (06:48):

People who attend pulmonary rehab do have a history of cancer. And you mentioned some of these and the work that you're doing. And even just with that last answer about some of the ongoing side effects of either their cancer or their treatments, like the brain fog, you mentioned anemia and shoulder, but I wonder if you could summarize what those long-term effects of cancer and their treatments are, the things that really you're finding kind of affect attendance and potentially participation in a treatment like pulmonary. rehab.

Dr Kristen Campbell (07:20):

That's a great question. And I think if someone has a pretty recent cancer diagnosis and treatment, so, you know, within the last year or so, there is people don't recognize it. I think that it takes a while to sort of bounce back from these treatments and people have really a lot of persistent fatigue. And if you've had surgery followed by chemotherapy, followed by radiation, that's sort of a six to nine months, you know, chronic medical engagement that really does lead to a lot of deconditioning and no matter how hard we try and get people moving. And so it takes a little while to kind of get yourself back up. So I think giving people time to get slowly get their stamina back again is really the key piece. So people will have fatigue for, I would say a good 12 months after treatment.

Dr Kristen Campbell (08:04):

It's slowly resolving, but it's still there. One of the main sort of things that stays around from cancer treatments potentially is peripheral neuropathy. So some of the chemotherapy drugs, just in the nature of how they work, they also impact peripheral nerves. And so hands and feet people report tingling, numbness, just pressure sensitivity, hot, those types of things. And so while that tends to resolve after treatment, it, some people, it doesn't completely ever go away. And so then you end up with things like people have sensitivity to running shoes or a lot of pressure with treadmills and sort of that friction on their feet, balance can be an issue with peripheral neuropathy, if it's quite extensive and then hands, you know holding onto bands, holding onto handheld weights, those things can be a challenge if someone's still experiencing the neuropathies in their hands. There is potential risk of cardio toxicity with some of the chemotherapy agents as well.

Dr Kristen Campbell (09:00):

So that, that may be over overlaying some of the things as well. Taxanes are one of the particular drugs. So people get sort of you know, injection fraction issues. So that obviously has implications for what they're, what you expect for a physical activity response. Those are the main ones I can think of. And then, you know, people are always concerned about the cancer coming back. I mean, that's when you have a cancer diagnosis, you go through the treatment, your hope it's a curative intent and you hope for the best, but people are receiving serial follow-ups for a good period of time afterwards. And so one challenge is any ache and pain are new presentation of a symptom really can ratchet up the anxiety around, you know, what that is. And so that's just one thing in working with, with individuals, who've had a prior cancer diagnosis. I'm always looking for red flags and things coming back, but hoping I'm not seeing them. And if I do, you know, that delicate conversation like, oh, you know, when's your next follow-up with your physician? You know, that symptom might be something you just should get checked out, but trying not to alarm anyone that it may be a symptom of a cancer recurrence.

Dr Pat Camp (10:06):

So you mentioned fatigue, and that is obviously a big problem in cancer, but it's also a major concern in chronic lung disease too, like COPD and pulmonary fibrosis. So what are the current recommendations

related to exercise and fatigue in people who have had cancer? What should we watch out for? How do we might separate fatigue that might be too much, and we tip them over the edge versus potentially fatigue that could improve with a little bit more physical activity.

Dr Kristen Campbell (10:36):

Yeah, that's a great question. And I I'm, I'm curious too. I don't know how you unpack them. So I'll be curious to hear from you about how you might separate the if someone is, has the coexisting, pulmonary and cancer history. So with cancer related fatigue, it's actually interesting. This has been one of the ways we've been able to actually move the integration exercise into clinical care a bit forward because there's a fantastic large metaanalysis that basically looked at every intervention. People have tried to use to improve cancer related fatigue. So any pharmaceuticals psychological interventions, exercise and exercise by far and wide have, you know, you look at the beautiful forest plots and people are familiar with those. And it's the effect of exercise was fantastic. Psychological. What does he know? Okay. And pharmaceuticals was, you know, has no signal whatsoever. And so that's really been able to kind of put, suggest that exercise is the main recommendation, should all the medical things that need to be looked at by the medical team be addressed from there that really exercises the treatment.

Dr Kristen Campbell (11:38):

So that's been fantastic in terms of how that, the approach that in theory, after a cancer diagnosis, people, if they're on chemotherapy, for example, their fatigue usually fluctuates up and down a little bit as you receive your treatment. So typically chemotherapy is given in cycles and, you know, you feel terrible for the first few days after your, after your chemotherapy cycle, then you're given time to allow your body to recover enough to such you can get the next one. And so people's fatigue sometimes gets a little bit better and it does tend to accumulate over the number of cycles. So people usually get four or five, six cycles. So it does have this variable fluctuation day to day, but it does tend to accumulate and fatigue is primarily the most impactful I've heard and it's is with radiation. So radiation is usually given about four or five weeks, you know, daily, over weekdays only usually.

Dr Kristen Campbell (12:32):

And so that's when fatigue really starts to accumulate. And so that's kind of why, you know, why people might present with fatigue and it takes a while for it to go back down. I think, where it may be slightly different from what you're speaking about in the chronic lung disease, is that it should start to resolve. So the over time it does take a while, but it should tend to resolve. And so what we basically counsel people on, it's probably very similar in the overlap of how you approach it is that you need to slowly add exercise in to see what the tolerance is and you're going to be titrating. So, you know, did we start with 10 minute walks most days of the week? And if that goes, okay, your fatigue levels, aren't increasing, then let's do that for another week. See how that goes.

Dr Kristen Campbell (13:14):

And then maybe it's 15 minutes. And then we're slowly building up to 30 minutes, at least three days per week. So really monitoring symptoms, adding very gradually what typically happens. But from my observation is with someone on cancer treatment, they have a day where they're feeling it's super and they're like, yay. It's a nice sunny day. Like it is here in Vancouver. And they're like, I'm going to go and go for my hour walk or just get outside. And then the next two days is spent on the couch and that tends to happen during treatment when they have good days or especially when they finished treatment, they expect like, okay, last radiation treatment was yesterday, she started feeling better, "I'm just going to go

back to what I was doing before", or another nice day comes and out they go. And so I think that vicious cycle of like overextending feeling really fatigued and just goes around and around. So it's not exciting or fun, but it literally is that like slowly build back up monitor symptoms and give yourself a bit of time to recover. And then all the energy conservation techniques, which I'm sure you use a lot of as well in terms of like, what time of day do you have the most energy and those types of things.

Dr Pat Camp (14:17):

In pulmonary rehab I think what really identified that sort of a response to exercise that maybe we didn't capture early on were using activity monitors and realizing that while people seem to present with a fair bit of energy and they were able to do the pulmonary rehab program, including all the travel there and back, if you were to look at their activity, monitor either through a step counter or something, a little more advanced, like an accelerometer, you would see that their sedentary time had actually increased in the off day. So it looks like they're participating more, but overall their physical activity has gone down because of pulmonary rehab. And that allowed, I think for people to be able to back off a little bit on maybe the intensity of the exercise, the baby are still able to really achieve that higher intensity exercise for that hour three times a week and, and even increasing it, but at a certain cost, you know, increasing sedentary time on those off days. So maybe using tools like that will be helpful as we kind of understand what the whole package of their physical activity looks like and not just what they can do during our one hour exercise session.

Dr Kristen Campbell (15:33):

Yeah that's really interesting. And so then, you know, what it brings up to me is, well, do they need that higher intensity felt like that's, even if they're, we'll have more sedentary time, like what's the mechanism that's going to improve their cancer related fatigue, do you need to have a bit of overreach? So you have, you know, the physiological changes for, you know, it is unfortunate. You wouldn't really want someone to decrease their usual activity outside of your intervention. And so that's, that's gonna be a really interesting to try and unpack how, how to manage that.

Dr Pat Camp (16:01):

Are you aware, Kristen, of fatigue, scales that can be used sort of within such a tight timeframe that actually is able to look at sort of those day to day fluctuations and be able to get a sense about if things are maybe too much?

Dr Kristen Campbell (16:19):

Yeah, that's a great question. We typically haven't used that. Mostly that, you know, we use like everyone in research, the baseline end of study questionnaires, and then we just sort of are asking people like, "how did that go?" Okay l ike very not very systematic. There has been an interest in sort of treating cancer and exercise, like you know, athletic training. And so using like the, you know, if you're familiar with athletic training, people are like, have these diaries, like, how was your fatigue? How was your sleep? How has your, everything is sort of looking at like over-training, but I think that is an idea, but it hasn't really sort of caught on or isn't used universally. So people probably just use like a visual analog scale Like - " where are you today? Zero to 10?"but it hasn't been systematically used. There's not one tool where everyone's like, this is what you do when someone comes in, you ask them this. And if it's a six that you do this or four, if you do that, people aren't using that in the literature anyway.

Dr Pat Camp (17:12):

Yeah. And they haven't really been adopting it as a typical surveillance or monitoring tool in pulmonary rehab either. You know, we're much more focused on exertion and dyspnea as two main sort of self-report symptoms. So it'd be interesting to see if fatigue ends up being another thing that we should be thinking about looking at, as they're going through the program. Let's talk a little bit about lung cancer now, you know, you and I have had some chats related to some lung cancer projects, and it seems like there's some interesting opportunities for rehab during that lung cancer period, potentially prior to any intervention, especially if it's a surgical intervention, like a prehab kind of approach, as well as after any active cancer treatment, most pulmonary rehab programs at this point don't routinely admit these patients. It might be potentially because of expertise, but also that cancer pathway may not put pulmonary rehab really in, in that mix in a sense, but this really might change in the future as as like you say, more patients are starting to ask about rehab and if there isn't a cancer rehab program in a community, but there is pulmonary rehab, it makes sense that some of these patients might, might go there.

Dr Pat Camp (18:33):

So I'd like to talk a little bit about what pulmonary rehab healthcare professionals might need to know about rehabbing patients with lung cancer. And let's start a little bit with the exercise parameters. So many programs might use something like a six minute walk test and then take a percent of the workload achieved on a six minute walk test and focus on maybe heart rate, but typically in patients with COPD and pulmonary fibrosis, that heart rate response isn't as valid as it might be another populations. So they might use instead dyspnea scales and exertion scales, and keep an eye on oxygen levels to make sure that you know, that they're able to exercise safely and effectively. So when we think about exercise prescription for people that have lung cancer, are those parameters similar or what might be the approach there?

Dr Kristen Campbell (19:30):

Yeah. So this is a new frontier for me, lung cancer. So I'm looking very much to learn my pulmonary rehab colleagues. In terms of what comes to mind I think with lung cancer, one of the challenges why maybe exercise hasn't been as well embedded in the pathway is that, you know, the, the mortality rates maybe higher than some other cancers, like early stage breast cancer. And so my reading of the literature is that sometimes, you know, exercise is just not a priority for the patients themselves or the symptomology of the their experience of this symptoms is just such a production to go to rehab and all these sorts of things. So I think there's been a real limitation in doing research with this group for those kinds of reasons. That being said, there's a real change in cancer treatments, you know, in the last sort of 10, 15 years immunotherapy, like these things are improving.

Dr Kristen Campbell (20:20):

And I think the trajectory of lung cancers is sort of proving along with some other cancers that had, had had poor prognosis. So I think there's gonna be more and more individuals who are experiencing this and having a longer survival. And so there may be more opportunities. So what I think about what would be different for a pulmonary rehab colleague, everything you're talking about would be very appropriate. The six minute walk test is used a lot in oncology. I mean, if we love it much as everybody else does, and heart rate responses are interesting, especially those on chemotherapy. We tend to see people with really higher resting heart rates, at least in our breast cancer weight group. We've seen that and sort of lower resting blood pressures. And what we think is people even as much as they are trying to keep their fluids up and everything are just a little volume depleted.

Dr Kristen Campbell (21:06):

And so we have a whole process of trying to get resting heart rates. And if it's above a hundred, this is what you do because technically according to ACS and that's resting tachycardia and that's a contraindication to exercise. So we have a lot of leniency on that front just to monitor symptoms, even if people have higher resting heart rates. So a lot of RPE, we use rating of perceived exertion for a lot of our work as well. We use a heart rate reserve. So we try and take into account resting heart rate, as well as our measured maximum if we have it. But I'd say, you know, rating of perceived exertion is definitely something that we overlay with that, that kind of, if the heart rate targets aren't really working, that's what we're we're banking on.

Dr Pat Camp (21:45):

So there have been a lot of talk about exercise with people that might have bone metastases. And I know that you're part of an international group that has really tried to figure out how to have someone do exercise and not increase their risks of fractures in the scenario where you might not even know the extent of their bone Mets, or even if they have it at all. So how should this be navigated for the pulmonary rehab or any exercise professional that might be working with the patient where the risk is at least, you know, substantial or present?

Dr Kristen Campbell (22:24):

Yeah, that is one thing that I think with lung cancer is something we have to be aware of because lung cancer tends to be more advanced when it is detected. And so one of the main places where if lung cancer is metastatic, it's a bone is the first place it goes followed by the brain. And so this is a challenge that this is definitely a challenging area. I think PTs are well-placed to kind of be leading how to do this work right now. There are no international guidelines, There's no certifications you take, there's nothing that says I am certified to work with people with bone metastasis. So that's where the group that came together was PTs physicians sort of medical oncologists, physiatrist, as well as exercise professionals to say, like, what could the guiding principles be for this, knowing that it's a challenging area, but that this is a group that really could benefit from keeping people active to try and maintain their physical function and keep, you know, improvements in quality of life with that.

Dr Kristen Campbell (23:25):

So the general principles that we've come up with, and this is not published yet, it's just been submitted for peer review is one to try to establish a two-way communication with the main health care team members. So typically that might be a medical oncologist in the lung cancer setting because people are usually on persistent treatments. And so that's, you know, as with anything and working with clinical individuals, it's not the easiest thing potentially to make those connections. But I think that was really what it came down to, to understanding where the bone metastases are, what type of lesion it is. What's the extent -like how far is it in this bone presentation? It really is challenging for anyone that isn't working in the oncology setting or have access to the medical charts without that you really don't have a lot of information.

Dr Kristen Campbell (24:10):

And it was agreed on a Delphi that self-reporting bone metastasis from the patient about the extent really wasn't agreed upon is the way people want it to inform their decisions about what was safe for that individual. So establishing two-way communication, getting some insight from the oncologist, usually in this case about the location, the extent and what the plan is like, is there any medical

interventions are going to be happening? Is this person concerned about it? When you work with oncologist, you know, they're, they understand the reality of where they're working. And so to that, it's like, if you can get this person moving great, you know, they may fracture. That would be terrible, but, you know, I don't know. It's hard to really determine there's no, yes, no, this person's like definitely gonna a fracture. This person's definitely not. It's a very grey, and so I think that's where those communications are really important.

Dr Kristen Campbell (25:01):

Then relieving heavily on our colleagues who work at osteoporosis and have done that work to really focus on, well, what are, you know, better movement patterns that don't really stress where lesions typically are, you know, for cheaper lesions, you know, head of the humerus, head of the femur pelvis, like, you know, the controlled movements, not endrange, not rotational like fast big force movements. That's really what we've been advocating for this work without additional research in the area, which it is quite limited at this point. That's where we're really leading on is using the osteoporosis type approach. And then pain is one of the main kind of guiding principles. If people have bone metastasis, typically there is, there can be pain associated with that. And the challenge is they typically are on medications for that pain. So it, you know, asking questions before and after, like how was it after last session?

Dr Kristen Campbell (25:56):

How was your pain if you have pain, did you have to change your pain medications? Cause they'd be like, yeah, it was fine, but I just jacked up all that I was taking. That's also an answer that you want to know. And then you're just like any practice you're looking for any neurological signs that might be suggestive of a spinal cord compression or something from a vertebral fracture. So just good practice on that front. So not an easy recipe, but just use your clinical judgment and expertise and training to know if you feel like you're comfortable working with this person, or you want to refer to someone that maybe has more experience working with bone metastasis.

Dr Pat Camp (26:29):

I think those are really great recommendations. And even for a healthcare professional to go and look at some of those osteoporosis focused exercises, I think that would provide them with at least some confidence that they can provide some exercises that have a little bit lower risk, potentially even while they're trying to figure out with the oncologist, what might be the safest approach. So that's so helpful.

Dr Kristen Campbell (26:55):

And one Thing I will add on that there are guidelines- So someone is diving into this world-There is some guidance from a group in Western Australia. They are the ones who sort of started down the road of could we actually prescribe exercise for this group? And they developed a bit of a table that, you know, if metasies is here, you know, don't do this, don't do that. This is okay, this is that's okay. And so what they have acknowledged because individuals who worked on that are part of our working group, they recognize that it's very conservative early recipes. So if you do look up Daniel Galdeo and Rob Newton, that's where you'll see that work. And that's, what's typically been informing if you dip your toe into this world and someone says, you know, the table, the guidelines, that's what they're referring to. What was came up in our international working group, is that the challenge with those is that if you use it to the letter of the law, you could be literally having someone do bicep curls, and that's all they could do.

Dr Kristen Campbell (27:49):

And so there was appreciation that that may have no appreciable benefit for the person's goals. It probably doesn't have less impact than they get from their activities of daily living like descending stairs, for example. And so how do we move forward with that? And so that's the attempt with this international working group is to say, yes, that's the framework we started with. Now, let's look at patient goals, let's get a bit more information about the person and let's see what we can reasonably try out with this individual and see what works for them. So just if someone is reading in this world or trying to get into it, you will see that, and there's nothing wrong with that. It's the first step. But these guidelines that we're putting forward that are hopefully will be published in the next year, kind of try and take a step forward from that to really better meet I think patient goals, you know, people are asking if they can go downhill skiing and I'm like, well, you could, according to this chart, you can do bicep curls that you can. There's just a not a meeting of the world there.

Dr Pat Camp (28:43):

That's fantastic. And so that's a resource that we could put in the show notes for people to be able to access. Wonderful. Now, maybe just a very quick question around education. Obviously there's going to be some things that are going to be quite similar to pulmonary rehab education. You mentioned energy conservation, but are there some specific things that pulmonary rehab professionals should add to their education or will most educational needs be covered by the oncologists and their team?

Dr Kristen Campbell (29:14):

That is a great question. And so pulmonary and cardiac rehab seemed to have a nice package. Like here's the education that goes with it. Here's the general exercise approach. Cancer rehab does not have that. There is no set curriculum. There is no standardization for the most part. Cancer rehab has been PTs working on musculoskeletal concerns or exercise programming on their own. These there's no package. And so in terms of educational needs, I would say there's nothing that probably what is already being used in pulmonary rehab would be very appropriate. I think there would be a lot of good information there that would be very helpful. In terms of whether the other educational needs are handled by the oncologist or the cancer setting, I don't know how to diplomatically say that. Maybe, maybe not. And so really what we ended up doing is referring people a lot to the Canadian cancer society.

Dr Kristen Campbell (30:05):

I mean, that's, they are the main organization in Canada that provides patient support. That is their raison d'etre. And so they have a really, a lot of good information on their website. And so that's what typically, when people are asking questions, clinicians are asking me, or even patients themselves sort of, I refer them to that resource to kind of get more information. And that might be where I think as you know, Pat, you and I are discussing, or may do your project and lung cancer, I think we'll learn like, what are the things that are missing from the pulmonary, we have curriculum that would be very important for this group. And then what would be unique for this group that we might need to add? Because at this point I don't, I couldn't say for sure what, what we will learn from what their educational needs are that may or may not be being met.

Dr Pat Camp (30:49):

And we have listeners fortunately from around the world that may have really extensive cancer support resources, but luckily all of these things are online. So if you're in a place that your cancer education

materials, and other kinds of patients resource materials, hasn't been as well developed, I would encourage you to go to the the cancer agency materials And I'll certainly put that link in the show notes. So let's end off with just a general question about where, where other resources that pulmonary rehab professionals can go. So we've mentioned some of those patient education resources, where have you found for people working in the rehab space, other other agencies, or other types of things that people could even order or access? What have you found to be helpful as you've been thinking about developing cancer rehab?

Dr Kristen Campbell (31:44):

Yeah, that's a great question. I mean, as a researcher, I always go back to the literature, like the main papers you should read it. I can certainly provide some of those for the show notes. There is the American College of Sports Medicine guidelines for exercise for cancer patients. So a CSM is pretty much the leading exercise, clinical exercise organization internationally, and they have taken on this cancer piece more so than say other organizations. And so those guidelines were updated in 2019. So I'll make sure that you have those in the show notes. With that those guidelines are also was an accompanying paper that talked about how it was a call to action like - how do we get exercise into clinical care? Because exercise professional and PT, we don't what we're doing, but on ecology, it just hasn't been a history. And so I think if someone's trying to start this world, that will give you a really good insight as to like why it's not there already and how we're trying to move it forward with ask, advise, refer was kind of the tagline there to get oncology and nurse practitioners working on colleges, at least get people, some resource.

Dr Kristen Campbell (32:44):

And then the PT world, there's a few well there's one researcher that I think is probably one of the most well-known in this field, the Cole Stout. And so I think if you want it, I'll, I'll give you some suggestions for that. But that is a researcher from the U S who's done a lot of thinking about how do we integrate this into clinical care and care pathways and triaging and things like that. So there is a really nice recent review that she's done around. How do you get exercise into oncology pathways? And so that's published in 2020, so I'll definitely make sure that's available as well. And then there's another great work specific to lung cancer by researchers in Salt Lake City, Utah, Chris Barnes is the main author there, and he's a PT and they've been able to integrate PT into the lung cancer trajectory in their inpatient setting.

Dr Kristen Campbell (33:31):

And so that's been really interesting to see kind of how it could be integrated, you know, funny conversations about this, the space, like there's literally nowhere in the oncology setting the clinic, it's got six rooms and the oncologists are booked in at like 10 minute intervals. And there's not even a space a PT could talk to someone because that room needs to be used and you need to move on. So just troubleshooting things like that, which you think really this is the main barrier, but it is the barrier. So I'll definitely make reference to that. In terms of continuing education there is efforts probably at each professional organization at each country around, you know, getting cancer on the radar and getting PTs and exercise professionals kind of upskilled in cancer in Canada. There is the oncology division of the Canadian physio-therapy association, and there is some educational courses that are run through that. The American PT association also has a very active oncology division, and I'm sure that's similar across the world. That's where the majority of the continuing education has come from. There's not one standard course, there's not one certification I would recommend. And there's a few textbooks that are out as well, which I'm happy to provide. They're mostly from an exercise professional standpoint rather

than a PT, but there's a new PT textbook coming I hear. So I'll make sure that any of those resources are in the show notes for anyone who's interested.

Dr Pat Camp (34:47):

That's a great set of resources because pulmonary rehab are run by physiotherapists, nurses, respiratory therapists, exercise specialists, with the kinesiology backgrounds. So people are coming to it from a lot of different kind of basic baseline expertise. So all of those resources, I think that's going to be fantastic for people to dive into. So thank you so much, Kristen, for taking the time to talk to us today. You've really provided us with a great amount of information in a short period of time. And if you want to hear more about Dr Campbell's research, I encourage you to visit her laboratory website and I'll put the link in the show notes and you can read a few more of the papers and all of these resources that we've talked about today. I'll certainly make sure that they're all well detailed and laid out in those show notes. So thank you again for joining us today Kristin.

Dr Kristen Campbell (35:40):

Thank you so much. And if I can put one last plug in, I mean, I think people always think that I mean all chronic conditions have their own ups and downs, but people are really concerned about working with cancer patients. They think it's going to be sad and depressing and you know, there are all those things with any clinical group, but I think the one thing that I've taken away from this work is you definitely see all the benefits that exercise can have for this group that has just been under utilized. And I think if you can get people together that have a similar experience and they can talk amongst themselves about their own experience ,and I'm sure this is similar for COPD, that is so valuable. And I think giving people that opportunity is kind of why, you know, selling, selling the, the exercise during cancer piece. So it's really rewarding.

Dr Pat Camp (36:23):

That's fantastic. I think that, you know, we have to add more options for lung cancer patients and pulmonary rehab professionals could certainly be that resource in the community. And it sounds like there's tons of overlap between the two types of rehabilitation and maybe just a little bit of extra learning will allow you to create a safe and effective program for lung cancer patients. So thank you for adding that. So we're going to say goodbye now. Thank you again, Kristen, for joining us. Thank you very much for having me and until next time, keep moving everyone. Bye for now.