

## **“Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]**

Brad Power

March 8, 2023

*“The focus of the protocol was to help people build their muscle mass, bone density, deal with pain, and deal with fatigue, all based on the notion that moving weight in a systematic way can actually help people get stronger during and after cancer treatment.” – Cathy Skinner*

*“My claim to fame, when I work with cancer patients face-to-face, is I'm the queen of modifications. For example, if you're someone who is limited in their movement, because your bone metastases are at risk for falls, I can modify the exercises and make them more appropriate for someone at risk. Or I can take it to the other extreme on how to make them more challenging.” – Cathy Skinner*

### **Meeting Summary**

Advanced cancer patients, especially patients on hormone therapy, want to learn more about how exercise can help treat their disease. Advanced prostate cancer and breast cancer patients on hormone deprivation therapy suffer a decline in their muscle. Their heart is a muscle, and declines in cardio health are a common side effect. Another side effect can be weight gain or weight loss. Exercise is an intervention patients can control to offset the side effects of hormone therapy, and is generally one of the best anti-cancer therapies, strengthening the immune system and resiliency.

### ***What should a cancer patient do? How can exercise be added into everyday life?***

Cathy Skinner, CEO of The Art of Well and NXgenPort, has designed exercise programs that focus on building strength, balance, flexibility, and addressing weight management for cancer patients. Along with improving physical well-being, the program improves quality of life, function, range of motion, and stress management for survivors. Cathy shared ten exercises which can be personalized for cancer patients. You can see the exercises in the transcript or slide deck.

### ***What is Cathy working on now?***

During the pandemic, Cathy had an opportunity to work on a new startup, NXgenPort. This is a smart port that can monitor biomarkers and potentially personalize dosing. It is in an early stage of development.

*The information and opinions expressed on this website or platform, or during discussions and presentations (both verbal and written) are not intended as health care recommendations or medical advice by Cancer Patient Lab/Prostate Cancer Lab, its principals, presenters, participants, or representatives for any medical treatment, product, or course of action. You should always consult a doctor about your specific situation before pursuing any health care program, treatment, product or other course of action that might affect your health.*

# “Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]

## Meeting Notes

*The information and opinions expressed on this website or platform, or during discussions and presentations (both verbal and written) are not intended as health care recommendations or medical advice by Cancer Patient Lab/Prostate Cancer Lab, its principals, presenters, participants, or representatives for any medical treatment, product, or course of action. You should always consult a doctor about your specific situation before pursuing any health care program, treatment, product or other course of action that might affect your health.*

## Conversation Outline

1. Introduction to today's topic. (2:01)
2. Hormone therapy and exercise. (5:44)
3. Dealing with muscle mass loss. (10:48)
4. What is lymphedema and how to manage it? (16:04)
5. Sitting twist exercise to relieve stress. (21:36)
6. How to do modifications for each exercise? (27:41)
7. How to prevent injuries? (33:52)
8. What's next for bone strengthening? (39:20)
9. NXgenPort: Pre- submission to the FDA. (44:21)
10. Challenges of going to market with a startup. (49:06)

## SUMMARY KEYWORDS

exercise, people, cancer, called, hormone therapy, cancer patients, lymphedema, data, physician, lower extremities, shared, port, predicate, squats, kathy, hips, question, hand, patient, knees

## SPEAKERS

Cathy Skinner (58%), Brad Power (9%), Rick Stanton (8%), Russ Holyer (7%), Amit Gattani (6%), Eric Hall (5%), Dale Yahnke (2%), Jeff Krolick (2%), Brian McCloskey (1%), Kevin Fordney (1%).

## Brad Power

We're honored to have Cathy Skinner with us. I met Cathy at the Personalized Medicine Coalition conference four years ago. I was very intrigued by the work that she was doing at that time in exercise, which she will explain. Recently, she's done a pivot and is working on a very interesting medical device, an intelligent port. When people are getting infusions, sometimes they get a port. This port then also measures various vital signs since it's stuck in your chest.

## Cathy Skinner 2:01

I come to the cancer space because cancer came to my house over 20 years ago where my dad sadly was diagnosed with multiple myeloma, and he passed away. His journey inspired me to work in the cancer space. I've done three startups bringing different types of products and

## “Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]

services to cancer patients and survivors. The first one that I started was called “The Art of Well,” and that's what I'm going to be bringing to you today. It's a research-based protocol for cancer patients and survivors. I say “research-based” because of a woman named [Katie Schmitz](#). I call her “The Queen of Cancer Exercise”. Back in the mid-2000s, like 2007, she started doing research on the impact of exercise on cancer patients and survivors. She did a study called the “[PAL trial](#)” (Physical Activity and Lymphedema), which she started here at the University of Minnesota and then migrated it to the University of Pennsylvania, which was a better move because she had a more diverse population of participants. She studied how moving and weight strength training could benefit breast cancer patients and not trigger their lymphedema. (Lymphedema is swelling due to build-up of lymph fluid in the body. Lymph nodes act like a drain in your sink. If the drain is clogged, the fluid cannot drain. It usually happens in the arms or legs, but can occur in other parts of the body.) Lymphedema for breast cancer patients happens in the upper extremities. For prostate cancer patients it can happen in the trunk and the lower extremities. I want to make sure we touch on that today and see if that's an area of concern.

I've worked for over 10 years face-to-face with cancer patients, men, women, all different types of cancer stages in treatment, post treatment, metastatic disease, and I would meet with people face-to-face in their homes or meet with them at a fitness studio, yoga studio, Pilates studio, and do a cancer exercise protocol together. **The focus of the protocol was to help people build their muscle mass, bone density, deal with pain, and deal with fatigue, all based on the notion that moving weight in a systematic way can actually help people get stronger during and after cancer treatment.** There's a whole bunch of research that shows what exercise can do to improve quality of life. In some cases and some cancers exercise can have an impact on recurrence of disease; not all cancers, but on some.

We're gonna do an exercise protocol today. I know some of you are physically active and some of you not so much. Some of you just need a kick in the pants to get going. Before we get started it would be helpful for me to understand from you, what are maybe one or two things that you love about exercise, or you hate about exercise. Where are you at? What are you doing? What's working? And where do you have gaps? Where do you need support?

### **Rick Stanton 5:44**

I can start. It always seems like it's always later in the day. Like today, I think, “I'm going to work out in the morning.” Then with interruptions and laziness, it shifts to later in the day. For example, yesterday, I ended up lifting a few weights. I need to focus. I bought an elliptical machine, and I get on it every three days and do “HIIT”, high intensity, two-minute segments eight times, where 30 seconds is max, and 90 seconds is recovery. It's “[Dr. Kevin](#)” from [Abundant](#). He's engaging; he's fun. During the 90 seconds, the music goes really loud. Then during the 30 seconds, you relax. It gets my heart by the end to about 151 or 155 beats per minute. So I try to get my heart up there. But I'm all on board to listen to what you're going to present. I'm excited about it.

## **“Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]**

Ross is in a frickin' gym. He's lifting while we're talking. He should be super impressive.

### **Russ Holyer 7:06**

I work out a lot. Today I'm going to do the middle of 60 minutes – my first workout. My second workout is 30 minutes, and my third one at night. I'm one of those guys, if I work out late at night, I can't sleep. So my third one's only six minutes.

### **Rick Stanton 7:25**

Way to go.

### **Russ Holyer 7:26**

I've been working out my whole life. It's something I really enjoy. One thing that doesn't get enough attention is the brain benefits, the outlook benefits. When I don't work out, if I stop for a couple of weeks, I start to get depressed; I get blue. When I work out, everything looks brighter.

### **Cathy Skinner**

You're addicted. It's the endorphins.

### **Russ Holyer**

Probably the endorphins, more than the enkephalins (compounds that occur naturally in the brain — peptides related to the endorphins, with similar physiological effects).

### **Cathy Skinner 7:56**

Russ brings a good point to the conversation: that you can hit a threshold where you actually miss exercise. Some of you will be going, “What?” But yes, it can become a habit. And it becomes essential. I have to exercise frequently because I am under a lot of stress, and that's the only way for me to manage my stress. I injured my knee in November playing volleyball, and I was in a dark place because I couldn't process my stress. I was worried about my knee recovery. I had to think differently. There are some challenges out there, and there are some benefits to it.

### **Dale Yahnke 8:39**

How many people are on hormone therapy? I'm 14 months into it. I'm like Russ a little bit. I've worked out my whole life. My doctor told me that weight training is good. But without any testosterone, it's hard to build muscles. I try to do three or four sets of 30 push ups a day. I do planks. I do dumbbells, not really heavy weight. I try to walk two and a half miles on the treadmill each day. I play pickleball, and I play golf, and about 130 years ago I played small college

## **“Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]**

basketball. I played competitive squash. I like to compete. But I have found since I've been on hormone therapy, it's a challenge. I get tired much easier. I still work out, but it's not as easy to do. On top of that I'm 66. It sounds easy to do all those things, but the hormone therapy kind of beats you up.

### **Russ Holyer 9:36**

I was on hormone therapy. Now I'm on bipolar androgen therapy – a whole different ball game. But when I was on hormone therapy, I had muscle loss like you. I started doing something called “[SARMs](#)”, selective androgen receptor modulators. That's very experimental though. When I was on straight hormone therapy I found that the only thing I could do was to break things up. I could work out intensely for maybe 10 to 15 minutes at a time. I'd get wiped out. So if I worked out three times a day, in 15 minute chunks or 10 minute chunks, even. I felt like, “Yeah, I've done something.” And I felt better. Even low intensity, like walking or bicycling, slow bike, made me feel a lot better. I did lose a lot of muscle mass, but I mitigated. I kept a lot of strength, and I kept a lot of energy.

### **Brian McCloskey 10:34**

Dale, some words of encouragement: almost everybody here is on some form of hormone therapy. What you're experiencing isn't unique. Everybody feels that way. But, as you're doing, just continue to fight through it. In terms of losing muscle mass: yes, you'll lose muscle mass for sure. But you can do surprisingly well. Russ is a great example. There are others that are very focused on weightlifting training. You're going to be fine.

### **Dale Yahnke 11:12**

I play golf. Since I'm on hormone therapy, I petitioned my club to hit off the red tees, but I got denied.

### **Rick Stanton 11:26**

I was in your shoes 16 to 18 months ago. I felt fatigued. I couldn't work anymore. I really think I was wearing a lot of my mental limitations. So now 18 months later, after I was feeling fatigued, and, “I can't lift heavy,” or “I just don't have it,” I'm probably physically less fit or just as fatigued, but mentally I think I've stepped up. I encourage you to as well. As I look back, some of it's just in my mind. If I look back 18 months ago, I could have been doing a lot better than I did because of my lack of motivation. I don't want to say self pity or whatever it was, but I wasn't working out as hard as I am now. And I'm not in any better shape. I'm not in a better place, except for my ability to take on more and just start believing I can. So I encourage you to dial in, and probably Cathy's going to inspire us right now.

### **Cathy Skinner 12:58**

## **“Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]**

You are in a different place, Rick. You've made great progress.

**Amit Gattani** 13:03

I have metastases all over my bones, as probably many of you do. Because of that, and concern with the fragility of my bones, I was basically told that any hard exercises are off limits. I used to love skiing and biking. I'm not much of a golfer, but I was told I shouldn't be golfing, because just the swing movement can be impactful. I am curious how others have dealt with bone metastasis issues and fragility or concern around fragility of bone because the last thing we want is some type of a fracture, given our bone structure. I've been limited to mostly walking, hiking, and light strength-band-based strength training.

**Jeff Krolick** 14:08

I'm kind of in the same situation, but for a little bit different reason. I also have familial (or inherited) neuropathy. It has created some significant muscle loss primarily in my lower left leg, so it can affect my balance a little bit. I have to be thoughtful about what I can do. I can bike. I can walk for an hour a day. I can do squats, but nothing really very active, and certainly nothing at all involving running.

**Cathy Skinner** 14:55

Is anyone dealing with lower extremity lymphedema?

**Eric Hall** 15:05

I am not dealing with it currently, but I just had surgery three weeks ago.

By the way, I'm chomping at the bit to get exercising again because I'm a huge exerciser. But I'm worried about lymphedema. My question is more on the preventative side if there's anything to do?

**Cathy Skinner** 15:32

Does any other gentleman on the call have lower extremity lymphedema?

**Kevin Fordney** 15:38

I'm not familiar with the "lymphedema" term. Neuropathy, yes, from a trial that I was on. Sometimes my legs feel good, and sometimes they feel like a couple of tree trunks.

**Cathy Skinner** 16:02

## “Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]

That's good news. It's quite common in breast cancer when you have lymph node resection, but it's not unheard of in prostate cancer. It's a swelling of the lower extremities because the lymph nodes were removed, and they're not working effectively. Protein rich fluid gathers in different parts of the body, and lower limb extremity or lower extremity lymphedema is really hard to manage. If you don't have it, knock on wood, let's hope that that continues.

*Fatigue: Sleepy in St. Louis*

CancerHackerLab

# How to Add Physical Activity and Wellness to Address Fatigue

Cathy Skinner, MA  
ACSM-Cancer Exercise Specialist  
CEO of The Art of Well  
CEO of NXgenPort


Let me take about 10 minutes to present some exercises to you. You're welcome to move with me if you wish. My claim to fame, when I work with cancer patients face-to-face, is I'm the queen of modifications. For example, if you're someone who is limited in their movement, because your bone metastases are at risk for falls, I can modify the exercises and make them more appropriate for someone at risk. Or I can take it to the other extreme on how to make them more challenging.

This deck that I'm going to be going through is available in the notes here and on the website, and you can take as much or as little as you want with the physical activity that I'm going to be describing today.

**“Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]**

Potential benefits of regular exercise


- Improve balance
- Build muscle
- Treatment-related heart health issues
- Chemo-related bone health issues
- Better blood flow
- Self-esteem
- Anxiety and depression
- Social life
- Fatigue
- Weight maintenance
- Quality of life
- Recurrence risk



There are lots of reasons to exercise, and based on the conversation with this crowd, there's no reason to try to convince you that it's good.

Group vs. individual exercise

What is your preference and why?



individual

group

6

But how to do it? How to be consistent at it is one of the challenges. One thing I'm hearing is that many of you are doing activities on your own. Maybe there'd be a higher level of

## **“Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]**

accountability or support if you had a buddy or a friend or a partner to help you meet up and do some kind of a group activity.

Eric talked about recently having surgery and chomping at the bit to get back well, people who really like to exercise and need to use it to manage their stress, or feel like they're in control, which is a beautiful thing, have to make sure that they don't start too soon and too fast and cause damage, or make things worse. So, Eric, start slow and go slow, and you'll avoid an injury, please.

**Eric Hall 18:47**

I'm trying. It's taking all of my self discipline.

**Cathy Skinner 18:50**

Find someone who's going to sit on you and have you rein it in. Or maybe learn something that's brand new that you've never tried before. For example, I shared earlier that I injured my knee. For years, I was a fan of strength training and walking and cycling and doing Pilates. And I'd always thought, “Oh, my god, yoga, that's just lame.” I felt like if I took a yoga class, then I would have to go work out. Well, hello, with a knee injury, yoga turned out to be the perfect thing. But I had no expertise. I had to learn it from the beginning. So that forced me to go slow. And it also awakened me to the gaps in my motor pattern and how one leg was much weaker, and where I had balance issues, and where I had tightness in my hips and tightness in my spine. So now I've become a big fan of yoga. So think about something, Eric, maybe it's yoga or pilates or cycling or something that you haven't done before. That might be a way to introduce you to something new where you have no choice but to learn it, and learn it slowly, and that can be a welcome distraction.

And I want to say the word “distraction” again because I've worked with many, many cancer patients that have metastatic disease. And with the fact that you're looking at a limited time in your life – maybe, maybe not – I've worked with many cancer patients who found exercise to be a welcome distraction. They're doing something that takes them out of their head, out of their daily lives, out of their appointments. And it allows them to do something where they feel competent, and they feel like they accomplish something. I am thinking of one woman in particular, who, because she was dealing with metastatic disease, had to make choices every day where she was going to spend her energy. And she always made exercise – even a modest amount of it – a priority because she knew she would feel successful. That was her purpose.

I'm going to take us through a couple exercises.

**Russ Holyer 21:12**

You mentioned hurting yourself by getting back too soon after a surgery. After my radical prostatectomy in 2018, that was me. I was chomping at the bit to get back two weeks later since

## “Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]

the catheter was out. I found I could do upper body exercises at three weeks, against the doctor's recommendations. I didn't have a problem with those. But then I did squats and deadlifts like a month and a half later. And those opened up the whole thing again. I had to lay off though. I still go lighter on squats and deadlifts even to this day.

### Cathy Skinner 22:11


Here's the plan. And feel free to move with me if you want. But we're going to do a few exercises. I'm going to do them briefly and give you a couple helpful tips.

## Seated Twists

A strong core is key to having good balance and to reducing fall risk and potential bone fractures. This exercise works the muscles of side core. The only equipment you need is a chair without arms.

Sit at the front edge of a chair with feet flat on the floor.  
Twist as far as you can to one side and hold.  
Twist to the other side and hold.  
Complete two sets of 10 repetitions each.  
Breathe and relax through the movement. Try to gently twist a bit further each repetition.

Modification: If you have bone metastasis in your spine, twisting is not recommended. Instead, do gentle side bends to activate your side core muscles.

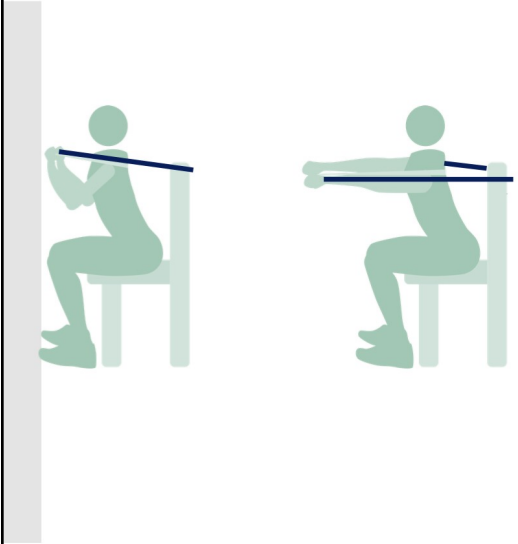


7

Wherever you're seated right now, come to the front edge of your chair. This is one variation, and then I'm going to give you another option. As I shared, I'm the queen of modification. If you don't have cancer in your spine, for compressed discs, what you're going to do is a seated twist. This is really a great way to relieve stress, whether you're an advanced exerciser or a new exerciser. By sitting at the front edge of your chair, you can sit nice and tall. What you're going to do is twist and use your hands to gently draw across and look behind you. Every time I work with someone to do this exercise, I always tell them to let their shoulders down. This is how you know where your shoulders are: bring them up to your ears, and then drop them down, and then twist and breathe through that exercise. Then reverse to the other side. If you don't have any restrictions, keep doing that movement. But if you do have cancer in your spine or issues with bone metastasis, what I'm going to ask you to do is you're going to raise one hand up, and then you're going to gently arch and bend at the side body so you're not twisting your spine, which is acceptable. Oh, my gosh, how many shoulder impairments do we have, people? If you have a bad shoulder, keep your arm down, and then just reach from one side to the other side. So this

## “Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]

means you're not doing torque and twist on your spine. But you're still moving through the side body. Shoulder impairments should be a whole other class.



### Seated Chest Press

Putting stress on muscles also puts (good) stress on the bones which builds bone health. Sit at the front edge of a chair with a tall posture.

Place the center of the band or tube on your upper back (or around the back of a chair) and hold one end in each hand. Start with bent elbows then press your arms straight in front of you like you're doing a pushup in the air.

Move your arms out and in for a count of three using your chest muscles. Complete two sets of 10 repetitions each.

Modification: If you want more challenge, do this exercise while standing

9

Many people like to do upper body exercises, and as was shared by Russ and some others, you can do that, even post surgery. To make sure that you take the lower body out of any exercise, and to not create any unplanned strain, you can take a resistance band, wrap it around your back, kind of like a shawl, and then you can do a chest press and push away. If, for example, this seems too easy, you can convert it to a push up against the wall or push up against the chair. What I mean by that is you can take the chair, and then you can bring your body down and push it away. You can start at the wall, go to a chair, and then move to the floor with your knees down, move to the floor with your knees off the ground. So that's all getting to the upper body muscles. If a couple of you say, “I don't have a lot of time”, if you could do chest press, or some kind of push up, and if you're cleared through the lower extremities, some kind of a squat, you could do those two exercises, they cover a ton of muscle groups. In terms of efficiency, squats, and chest press are where you want to go.

## “Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]

### Chair Squats

Squats have the potential to improve bone health and prevent (or slow) bone loss in the hip. This exercise works the legs and hips. No equipment is needed except a chair.

Start with feet parallel, about shoulder width apart.

Press your hips back as you squat down. Look forward, chest lifted, and weight in your heels. Raise your arms forward with palms together as you lower your hips.

Squat down for a count of three like you're skiing down a hill (rather than sitting in a chair). You may or many not actually sit in the chair. The chair offers a bit of safety if you feel you need to sit.

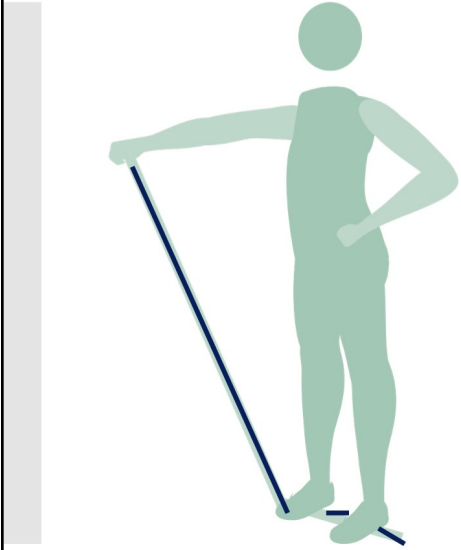
Complete two sets of 10 repetitions each.

**Modifications:** If you have discomfort in your knees, make sure your body weight is in your heels (not your toes). Also, instead of having your feet parallel, turn out your toes slightly so your feet are in a wide “V”.



Here are some helpful tips around squats. You can have a chair or not have a chair, but you want to have an athletic stance. You want to tap your toes because you want weight in the heels. And then from here, you're pressing your hips back because you want to activate your glutes and your hamstrings. You're going to bring the hands forward for counterbalance. Press the hips back, and you're going to be squeezing your backside pelvic floor. So reach and come tall. Now if you want to progress this and make it harder, more challenging, you take weights in hand, and just like grocery bags, and you press your hips back and you stand tall. A couple things that are not helpful: dropping your chin, rolling your back. Hips go back, chest lifts up, and cue your line of sight to look long. By lifting your eyes it helps throw everything else into position.

## “Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]



The illustration shows a green silhouette of a person standing on a grey vertical bar. A blue resistance band is anchored to the bar at the person's feet. The person is holding the other end of the band with their right hand, and their right arm is raised forward to shoulder height. Their left hand is on their hip.

### Standing Shoulder Raise Front

This exercise works the muscles and the bones around your shoulder and the back. The only equipment you need is a resistance band or tube which are widely available for sale online.

Begin with one end of the band under your feet and the other end of the band in your hand. Keeping your arm straight, raise your arm forward just to shoulder height for a count of three. Lower for a count of three. Repeat 10 times. Switch to the other side.

Repeat both sides for a total of two sets per side of 10 repetitions each.

Modification: If you have trouble with balance, you can do this exercise from a seated position.

11

### Cathy Skinner 26:56

I mentioned shoulder impairments. Guys are all really tight through your upper extremities. So you can start with a band, you can start with a free weight, but you can raise forward and you can raise side. Now if you do have an impairment, you can make it more simple, you can just do arm weight forward, arm weight side. You can progress it to make it a little more challenging by using maybe a water bottle or something that's in your house. You don't have to run to the gym. You can start with two hands. I'm working with a gentleman now. I go to his house twice a week. He's got a bum shoulder. So we do no weight in one hand, and a light weight in the other. And that works out just great. So what I hope you'll see is that there's ways to do modifications for each exercise.

## “Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]

### Forward Lunge

Strengthen your legs, knees and glutes with this weight bearing lunge. Versions of this exercise are similar to “warrior pose” in yoga. Doing a challenging movement like a lunge applies weight on your hip bones and helps them stay strong. No equipment is needed.

Begin with feet together. Eyes looking forward. Chest lifted. Hands on hips. Step forward with one foot as you bend both knees and lower the back knee toward the floor for a count of three. Keep the chest lifted. Try not to bend forward at the waist. Return to standing by pressing through the heel of your front foot. Activate the muscles on the back of your leg and your butt (hamstrings and glutes).

Repeat the lunge on the same leg 10 times. Switch to the other leg. Repeat both sides for a total of two sets per side of 10 repetitions each.

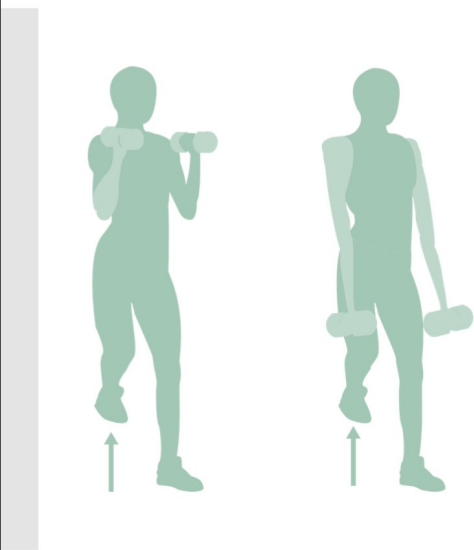
Modification: If you have trouble with balance, you can hold on to the back of a chair or counter top with one hand.



### Cathy Skinner 28:03

Lunges are great if you do them correctly. There's a way to start with doing the form correctly by using a chair. If you have issues with balance, go ahead and grab a chair, and then reach one leg back and bend both knees, you're looking for your head, shoulders and hips to split in between both feet. Then you lift through that front leg. So this is called a reverse lunge where the leg goes back, and you come together. And as you get stronger, you can take your hand off your balance element, reach back and come together, you can make the lunges more challenging by doing a forward lunge. I feel like those are more challenging because people have more trouble with their knees. So you touch down to the front heel, then both knees push back through the front heel. That helps to activate the hamstrings and the glutes again. With all the work that I do with cancer patients, I like to make sure that you're doing the form correctly, because you already showed up, and you're already willing to do the work. So let's make sure that you do this in a way that is helpful.

## “Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]



### Bicep Curls with Balance

This multifaceted exercise works the most important muscle of all — your brain! Building strength and balance reduces your risk of falling. This exercise works the muscles in your arms and your core. The only equipment you need are hand weights. An alternative to hand weights are cans of soup or water bottles!

Hold weight in each hand. Standing tall with chest lifted and eyes looking forward, lift one foot and balance. The knee of your standing leg should be slightly bent, not locked tight. A soft bend in your standing leg activates your core muscles and helps you balance. If you lose your balance, simply touch down with your foot and then lift it again.

While balancing on one foot, bend your elbows and raise the weights to your shoulders. Lower weights to a count of three. Complete two sets of 10 repetitions each.

Modification: If you have concerns about balance, do this exercise with both feet on the ground or seated.

15

### Cathy Skinner 29:32

I want to offer a way to make exercises much more challenging. It's by adding a balance element.

This is for folks that are in a more advanced place. For example, take bicep curls. The easiest way you can do them is seated. You can kick them to the next level and do them standing. Then to add a challenge, you can stand on one foot, and then you do your balance and your biceps. This is doing arms, core balance, and brain. For example, you could do this for bicep curls, you could do this for a row, you could do this for a raise. There are all kinds of ways that you could make the effort more challenging by adding a balance element to it.

There are a few more exercises embedded in the slide deck.

### Brad Power 31:14

I really like those exercises. You've inspired me. I sit at my computer a lot all day. I feel lethargic. I'm going to put some weights near the computer, and during those breaks, or sometimes during a call like this, I'll turn off my screen and stand up and do a few things just to keep me from being sedentary for hours on end. That's been helpful for me. I find that we know what we should do, but we don't do what we know we should do. So figuring out how to work exercise into your daily routines is key. It's like people say they put their shoes by the side of the bed, so they can go run in the morning, or whatever those tricks are – the reminders and just making it easier to do. I'd be curious if anybody here has any other tips or tricks that they found that helped them include exercise in their day?

## **“Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]**

**Russ Holyer 32:11**

I sit in front of a computer like that, too. I have a standing work desk with an exercise bicycle underneath. Now when I'm using my computer, I can just cycle away. I did that when I was on ADT so I could study prostate cancer. I was new to the game then. I didn't know what I was really dealing with. I could cycle away and feel better, get some energy.

**Rick Stanton 33:30**

I have a question about HIIT (High Intensity Interval Training - several rounds that alternate between several minutes of high intensity movements to significantly increase the heart rate to at least 80% of one's maximum heart rate, followed by short periods of lower intensity movements.). I tried to stop doing what I used to do, which was unconsciously troll along, what we used to call “LSD”, long, slow distance. That was in college. I've gotten away from that because I've heard that it doesn't really do much, like HIIT. So now I'm trying HIIT with everything I do. Do you have any comments or suggestions?

**Cathy Skinner 34:09**

Don't get hurt.

**Rick Stanton 34:12**

That's a risk, always.

**Cathy Skinner 34:14**

That's the biggest thing. But there's a lot of research that shows that small bursts of effort have a big impact. So that's a smart way to go. And thinking about, what is that weekend warrior thing that people do?

**Eric Hall 34:32**

CrossFit?

**Cathy Skinner**

Yeah, CrossFit.

**Rick Stanton 34:34**

My daughter's a CrossFit junkie.

## **“Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]**

**Cathy Skinner** 34:37

If you're a weekend warrior, it's an injury waiting to happen. So think about how to moderate it so that you can build up to that. Maybe one thing to really step out of your comfort zone is to find a workout buddy – someone to hold you accountable and to make it more fun when you show up. And if you don't show up, someone cares. That might be a stretch assignment for some people to find someone to work out with.

**Eric Hall** 35:13

I'll add a comment here about injuries. I've been an exerciser for decades also, and wanted to keep up intensity as I get older, even prior to cancer. I noticed I was getting more overuse injuries or tendinitis and joints and stuff. One thing I've done that's been really successful is that I almost always wear some kind of compression gear when I exercise, either tights or even a full body shirt, or heavy knee sleeves, elbow sleeves, something like that, to protect the joints while I'm working out. I'm a little bit more careful as I've gotten older, but that has helped also with just giving those joints support and keeping them warm in terms of injuring things.

**Cathy Skinner** 36:00

The reason that I taught a research-based exercise protocol that focused on strength and balance is if you build connectivity and strength around the joints, then the world opens.

**Eric Hall** 36:16

I really like your bicep balance idea there. As soon as I'm out of surgery it is a perfect way for me to progress again with lighter weights and introducing that stability into it.

**Cathy Skinner** 36:29

Yes, and it's great for your brain.

**Rick Stanton** 36:36

The Indo board and a Bosu ball are good for balance.

**Cathy Skinner** 36:39

Yes. Although I'm a fan of the blue side. People who stand on the black side are nuts.

**Rick Stanton** 36:45

Oh, really?

## **“Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]**

**Cathy Skinner** 36:49

Standing on the black side is like an ankle injury waiting to happen.

**Amit Gattani** 37:05

Besides the presentation that you shared, is there a bigger booklet of all the different kinds of exercises that you would share? How do we get a broader set to pick and choose from?

**Cathy Skinner** 37:22

The presentation I have to share with you has about 10 exercises. Then I'm happy to have a conversation with you. There's also a way to find cancer exercise trainers in your zip code. The [American College of Sports Medicine](#) has a certification called “cancer exercise trainer”. There's a tool called a “pro finder” on their website. There's also a woman named [Andrea Leonard](#), who created a certification called the [Cancer Exercise Training Institute](#). She has trained people around the country. You can use her website to see if there's someone in your zip code. There are people who have this unique training to work with cancer patients.

**Brad Power** 38:17

We're going to have Kerri Winters-Stone in an upcoming meeting. Kerri is a Cathy connection. She's at OHSU in the Portland area and ran a program that Kevin Fordney participated in.

**Cathy Skinner** 38:53

Kerri is a great connection. I shared my connection with Katie Schmitz, who is the queen of cancer exercise. Kerri Winters-Stone is a protege or a second generation. She's a specialist in cancer exercise and bone health.

**Rick Stanton** 39:15

Amit, are you taking [Prolia](#) (a prescription medicine used to treat osteoporosis)?

**Amit Gattani** 39:20

No, what is that?

**Rick Stanton** 39:25

It's for bone strengthening.

**Amit Gattani** 39:28

**“Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]**

Is it the same as [Zometa](#) (zoledronic acid, which prevents problems such as breaks in the bones in cancers that have spread to the bone)?

**Rick Stanton 39:35**

I don't think so. It uses a different mechanism. I helped discover the RANK ligands. (The RANK ligand, RANKL, is a key mediator of bone resorption in normal and pathological states.)

**Amit Gattani 39:42**

I'm on Zometa infusions for bone strengthening, but I'll look into Prolia.

**Rick Stanton 39:54**

Also marketed as Xgeva

**Cathy Skinner 40:00**

It's a drug from Amgen.

**Amit Gattani 40:07**

Is it a prescription drug or a supplement?

**Rick Stanton**

It's a prescription.

**Jeff Krolick 40:15**

Some insurance companies I was exploring said that. My insurance company wouldn't cover Prolia and would only cover another infusion base.

**Cathy Skinner 40:32**

I want to take a couple minutes to share with you what I've been working on since I was doing cancer exercise.

I was working face-to-face with a cancer patient back in 2016. She was telling me that instead of doing better on cancer exercise, she was doing worse. It was confusing. She went to her physician and found out that the drug that was fighting her cancer was also concurrently damaging her heart. She's still cancer free 12 years later, but she's more at risk for cardiovascular disease. Her story made me think, “Look at this chemo port that was implanted under her skin. Why couldn't we know sooner that this drug was impacting her heart?” I had this

## **“Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]**

idea back in 2016, but always knew that I needed a team of scientists and researchers and physicians and engineers.

At the same event where I met Brad in Boston in 2019, I met my co-founder for this company. She and I sat down next to each other for lunch. I introduced myself, and she said, “I’m a scientist.” And I said, “I have been looking for a scientist.” In May of 2020, we launched a company, called NXgenPort. We take a chemotherapy port, which almost always has this much real estate. We take microelectronics and optical sensors and embed them in the body of the port and make it smart. We’re tracking blood cell counts, heart function, and vitals. No one knows what’s going on within a patient’s blood until they drive to the clinic and get their blood tested. Then a “go, no go” decision based on their blood counts for chemo is made. We’re looking at how to measure a patient’s blood in between chemo visits as a way of assessing early signs of infection, and determining readiness for the next treatment. We’ll use the port, use data, and integrate electronic medical records and equip physicians to make decisions. The reality is we’re probably two to three years away from commercialization. We’re in early stages, testing in animals, raising money from investors, and then building out the prototype. I just wanted to take a minute to introduce you to what we’re working on, and see if you have any questions or ideas or connections.

**Amit Gattani 43:52**

Does this require an FDA approval for it to be used? Where are you in the whole cycle?

**Cathy Skinner 44:08**

It is going to be an FDA class II project (The FDA assigns each device to one of three regulatory classes: Class I, Class II or Class III, based on the level of control necessary to provide reasonable assurance of its safety and effectiveness. Class II is moderate to high risk. For Class II devices general controls alone are insufficient to provide reasonable assurance of the safety and effectiveness of the device, and there is sufficient information to establish special controls to provide such assurance.) It’s a 510(k) submission, based on predicates in diet, diabetes care, and cardiac care. (Section 510(k) of the Food, Drug and Cosmetic Act requires device manufacturers to notify the FDA of their intent to market a medical device at least 90 days in advance. A 510(k) is a premarket submission made to the FDA to demonstrate that the device to be marketed is as safe and effective, that is, substantially equivalent, to a legally marketed device.) We have predicates. This year, because we’re doing animal models twice, we’ll have enough design specifications to do a pre-submission to the FDA.

**Amit Gattani 44:32**

What is a predicate?

**Cathy Skinner 44:34**

## **“Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]**

Something that existed before that we can leverage; like pacemakers, because they're implanted and they have a battery, things like that. Anything that's kind of akin because we don't have a direct predicate, because right now ports are dumb. They're not smart. They're titanium and pieces of plastic, and they're a delivery tool. The chemo goes in, blood comes out. That's all that they're leveraged for.

**Brad Power** 45:01

I've got an Oura ring. It's looking at the veins and whether they're pulsing and thereby getting heartbeat, heart rate, and such. How similar is it to that technology or what might be in my Apple Watch that can check for atrial fibrillation and that sort of thing?

**Cathy Skinner** 45:28

The most unique factor that we're bringing to healthcare is the ability to measure blood cells in the body in real time without requiring a patient to go to a lab. Looking at this graph illustrates changes over time and neutrophil counts and looking for signs of febrile neutropenia. Also delivering the things that your ring provides: body temperature, heart rate, oxygen levels. Those are off-the-shelf sensors that we can put on the smart port that aren't patent-protected, or a unique secret sauce. But what it does is create a whole robust data package. A physician can look at blood cell counts, heart function, vitals and put it all together and enable them to make a decision based on the data

**Amit Gattani** 46:22

Can you measure PSA?

**Cathy Skinner**

Not yet.

**Russ Holyer** 46:32

Is it measuring CBC (complete blood count) in real time instead of discrete?

**Cathy Skinner** 46:41

Yes, exactly.

**Russ Holyer** 46:47

I can imagine that would be very helpful, especially how you respond to exercise in the immediate term, in real time, versus a delayed snapshot.

## **“Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]**

**Brian McCloskey** 46:57

Can you measure cortisol?

**Cathy Skinner** 47:01

Not yet.

If you've ever brought anything through the FDA, you want to do the most viable product first. Keep it simple, and then build in complexity from there.

Please let me know if you know anyone who is an engineer, or a scientist or physician that you think might be interested in something like this. We have an ongoing relationship with Mayo Clinic in Rochester, where we meet with an oncologist as a product advisor. We have a second agreement with Mayo, where we're joining their program called Accelerate. That's going to allow us to look at patient records, to query them to understand how many cancer patients are on chemo, how many have ports, how many don't have ports, how many are hospitalized because of febrile neutropenia. And then those data queries will allow us to build the hardware, the software, and the data part of our company.

**Eric Hall** 48:00

You spoke of your connection with Mayo. This is similar to some of the other startup companies we've seen, but none are like this with a smart port. Others are more about genetic testing or proteomic testing or something like that. One of the issues we've seen as patients is a problem with physician interest in using this technology, which is cool and can tell you a lot of stuff. I could go out and do some of these tests myself, but then finding a provider who wants to do something with it is a nightmare. I'm curious if you're working on developing that part of this as you scale up, because a huge part to making it viable is having that provider interest in and approval.

**Cathy Skinner** 48:59

Strange thing: physicians are people too. They don't like to change their workflow, and they're under a lot of pressure. Even in cancer, they have to adhere to very rigid protocols. As we're speaking with our Mayo counterpart, and this dashboard that I'm sharing with you, we really don't want to add another dashboard or another button to electronic medical records. We want to provide the same data points, but they're longitudinal. They're still provided at a point in time. A physician can see an ANC over time, body temperature over time, heart rate over time, which is a data set they don't collect. But we know they don't want the data exhaust. They don't want to be bombarded with another piece of a dashboard, another app, or another data point. Our first go-to-market is being very focused on what physicians already do on the data points they already leverage.

## **“Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]**

**Amit Gattani** 50:03

What is the size of the data set? You need to prove that this is accurate within the acceptable range. Does that mean 100,000 users or a million users? Does it mean lab collaboration? If the data is to be used for medical decisions, there has to be an accuracy band. What does it take to prove that this will have an accuracy band?

**Cathy Skinner** 50:36

It sounds like you should be our advisor, because you're asking all the right questions. Because we're planning to go to the FDA as a 510(k), there's a chance that it could be deemed a de novo, which would mean we'd have to do human clinical trials of 50 patients or less. It's really out to prove efficacy, because of what we're showing around the device.

But your question is about accuracy. What we're showing now with our benchtop prototype, comparing it to flow cytometry and culture counting, is a .85% correlation index. We are already seeing accuracy compared to a gold standard.

**Brad Power** 51:34

Amit, you're an engineer at Micron Technology. What do you do?

**Amit Gattani** 51:47

I'm a computer engineer by training for electronics and semiconductor chip design and development. In the later part of my career I was running businesses and marketing.

**Brad Power** 52:07

We all want to help startups like yours get to market. Just turning it back to you. What are the biggest challenges you face? Often it's angel investors who would want to give some money, such as Richard Anders of Mass Med Angels. Or it could be you have technical questions, or you could need places to test your technology or find your first customers. What are your immediate hot button needs?

**Cathy Skinner** 52:44

I'm pitching to Mass Med Angels tomorrow. We're also in due diligence for a lead investor out of the Bay Area. Finding a lead investor is one of the hardest things you can do in the startup world, especially with the war in Ukraine and interest rates. VCs are gathering up their dollars. The lead investor we're in diligence with is a group that's invested heavily in cancer. And when they found out about what we're doing, they loved it, because – this is going to sound funny – they didn't like remote patient monitoring because people had to wear stuff, or plug stuff in or log stuff, and patient adherence is terrible. When they found out that our device is passively

## “Adding Exercise for Everyday Life and Developing a Medical Device to Personalize Cancer Treatment” (Cathy Skinner) [#47]

collecting data because it's implanted in the body, that's what made them sign up for diligence and looking for a lead investor. Yes, money is always an issue. But more importantly, in very short order, we're looking for a senior lead engineer with optical engineering and medical device experience. So we're putting out in the universe that we're looking for quality qualified humans to join our team on the engineering side.

**Amit Gattani** 54:07

Maybe we can connect offline. I've advised a lot of startup companies to do due diligence and have invested in many companies. And obviously, I have interest in this space, personally.

**Cathy Skinner** 54:24

Brad can connect us.

I appreciate the opportunity to talk about exercise and to talk about technology.

My number and email is here if you need to follow up for any reason. Happy to chat with you.

Thank You!

Cathy Skinner  
cathy@theArtofWell.com  
651-587-5440

