HIT Business Membership - Dr Bryce Lee - How To Answer Questions And Customise Workouts For Clients With Orthopaedic Issues

Lawrence Neal: 00:04 Okay. Welcome, everyone. This is the March, 2019 Q & A with Dr. Bryce Lee. Some of you will recognise Bryce from his appearance on the podcast. And in this Q & A, we're going to be talking about how to answer clients who have questions regarding their orthopaedic issues. Bryce, did you want to just quickly give a short background about you, your expertise, and your bio?

Dr. Bryce Lee: 00:34 Yeah, sure. So I, prior to getting into strength and conditioning, and health, and physical therapy, I was an officer in the navy. And then I made a career switch into physical therapy. I went to Columbia University for physical therapy school, and then moved back to Virginia, where I worked as a physical therapist, for a while, before starting StrengthSpace, which is my high-intensity training studio. And it's also where I see patients, privately. I have some treatment rooms that are available to physical therapists, at-large, and myself included. And my interests are largely orthopedic. I've seen patients in a variety of settings, from the hospital to their home, to outpatient clinics. And I've been fortunate to

work with some really amazing patients, from whom I've learned quite a bit.

And I, of course, like the story goes ... I probably mentioned in the podcast interview, probably about 10, 11 years ago, I stumbled across Doug McGuff's book, Body by Science, and the rest is history. Once you read it, you can't un-know it. It's the rationale behind the approach, and it informs how I train clients, and heavily, how I treat patients. And also informs what I teach students, 'cause I do a good bit of lecturing at the local physical therapy doctoral program, here in Norfolk, Virginia. So, high-intensity training principles are working their way into the curriculum, as much as I can manage it.

Lawrence Neal: 02:07 That's awesome. Thank you for that. That's really good to sort of set the scene of that. So I'm quite looking forward to this, because I thought that your suggestion for this particular kind of podcast was really, really useful. And I think a lot of us who get into high-intensity training, be it a beginner, or somebody who's even been in the game for a while, may struggle with some of the questions we get from clients regarding some of

the more technical aspects regarding orthopedic problems and things like that.

And you're very uniquely placed. I mean, I don't know anyone else who's got a background as strong as you in physical therapy, but then also an interest in high-intensity strength training, and how getting into that has really shaped your understanding of exercise. And I honestly have to say, there's no one else. Do you know of anyone in the physical therapy world who has an appreciation for high-intensity strength training?

Dr. Bryce Lee: 03:08 Not personally. I think that I am getting some traction amongst my colleagues, but people who are passionate about it, like me, probably not. I do know that, actually, [Joshua Trentine 00:03:21] was, once upon a time, a physical therapist before he kind of devoted himself entirely to high-intensity training. But I think he and I are probably in the minority amongst physical therapists who sort of tend to put their focuses on valuable things, but not on the cultivation of quality muscle tissue and strengthening.

Lawrence Neal: 03:44 Interesting, I never knew that. Okay. So you sent me over a bunch of questions, which we're going

to use as the kind of structure for this one. Questions that you have had from clients, or perhaps you've heard from other people's clients, and ways in which you address those. And I figured what we'd do is kind of go through those, systematically, and then I may just kind of ask questions, on the fly, as they arise. So if I could assume the position of the client, and ask you the question, and we can, perhaps, go from there. Does that sound good?

Dr. Bryce Lee: 04:17 Yeah, that sounds great. Sure.

Lawrence Neal: 04:19 Cool. Okay. So these ones are in the context of managing the concerns of a client with a previous knee injury. So the client says, I don't currently have knee issues, but I'm worried that doing any heavy training for my legs will give me knee arthritis, later. Isn't arthritis just about wear and tear on the joint?

Dr. Bryce Lee: 04:42 Yeah. So this is a topic that I'm really kind of passionate about. And I think that it's going to resonate with listeners, because we talk a lot about myokines in the high-intensity training space, thanks to Doug McGuff and others who exposed us to those ideas. What we're finding is

that there's actually a whole host of chemicals on the other side of the spectrum, called adipokines, which are chemicals that are released A., in response to tissue damage, trauma, normal wear and tear, and B., chronically released by fat and adipose.

And so when you talk about arthritis, it helps to know about those things, so that you can explain to your client, "Contrary to what you think, arthritis is not simply about wear and tear. It's more about an imbalance between wear and tear, and repair." Every day, you walk down a flight of stairs, you do something, and the cells, the chondrocytes, the cells in your cartilage in your knee, and in your tissues are going to be under load, they're going to be under stress. And if that stress requires an adaptive response, if they need to be able to heal and recover from that, they're going to release chemicals that are going to sort of say, "Hey, I need assistance over here."

Chemicals like interleukin 6, and others which are also released in response to exercise and things. Chemicals that you want to have occasional acute spikes of in your bloodstream. Where

things go wrong is, when those chemicals are chronically elevated in the bloodstream. Because, then, the signal gets lost in the noise. Your help message that's going out from your knee or your shoulder is lost in the milieu, and your body is not really able to mount a focused healing response because it's systemically inflamed. So it's important to kind of help people understand, if we can metabolically manage your health well with proper diet and with proper exercise, we are enormously stacking the deck in favor of preventing your arthritis.

When you meet your average person who's got arthritis, in their 60s and 70s, many of them are sedentary people. They're not people who climbed Mt. Everest and got arthritis. They're people who got arthritis, on the couch, eating Cheetos, unfortunately. Because what happened was, their body shifted, metabolically, into a direction where it was chronically inflamed. These tumor necrosis factor alpha, interleukin 6 C-reactive protein, these chemicals became elevated, chronically. And their ability to deal with even trivial amounts of wear and tear on the joint went down.

So it's all long-winded, but suffice it to say, that the message to drive home to your client is, or to you, Lawrence, the client, is that if we mitigate wear and tear, as much as possible, by dosing exercise appropriately, and then we do the very important work of managing the diet, managing the lifestyle, to keep inflammation at healthy levels, that really is your best bet. And when you look at it, that way, if you look at it as a metabolic picture for arthritis, which it is, then you could see how appropriate strength training is actually very important. It's really critical, to establish healthy insulin, and glucose signaling, and the anti-inflammatory effects of appropriate resistance exercise that is demanding, really are powerful tools.

Now, none of this means that it's not about wear and tear. If somebody has an ACL injury, a meniscal injury, those things do predispose. But, like anything, it's about risk exposure. You can have a meniscal injury, and that doesn't necessarily doom you to severe arthritis. And you can have no meniscal injury, no problems with your knee, and develop severe arthritis, just due to the metabolic problems I described. So we

want to avoid trauma, which means we want to avoid, when possible, ballistic, explosive, acute stressors to our joints, which is why we exercise properly.

We save the stresses for the things we really care about, whether it's a sport that we love, or whatever. But then we use what we understand about diet and exercise as powerful anti-inflammatory tools, to really help our bodies to mitigate the effects of that wear and tear, by healing appropriately when it happens. And so, hopefully, our clients feel empowered to take control of the risk for arthritis by exercising and eating appropriately.

Lawrence Neal: 09:19 I love that. I love me some myokine talk. So just so I better understand that, 'cause a lot of the stuff you just said I'm learning, actually learning for the first time. 'Cause the myokines is such a vast topic, and I've only really started diving into it, recently. Doug touched on it, at REC 2019, last weekend, and I think Simon Shawcross put a post up, recently, on HITuni, so it's certainly starting to be talked about, more.

Now, just so I better understand this, the acute myokine response you get when you do a heavy leg press, is that essentially causing a lot of the signaling chemicals to actually strengthen the joints? And that then gives you more of a protection against other types of wear and tear, perhaps?

Dr. Bryce Lee: 10:14 Yeah, so it gets really nuanced, because you have chemicals that you would call myokines, that are also released by tissues, in response to damage. And they're also released by fat cells, at rest, just chronically, in proportion to the amount of fat that they're holding. So it's tough to know, is interleukin 6 a myokine? Is it an adipokine? Is it an inflammatory cytokine?

But I think the important thing to think about is, it's just like insulin or any other hormone, or important chemical. Cortisol, as well. These things are supposed to spike acutely when we do eat, for example, a potato. And then they're supposed to go away, and that's the important thing. Cortisol is supposed to spike, to wake us up in the morning, and then it's supposed to go back down to baseline levels. And the problem

becomes when you disrupt the natural signaling, because they're chronically elevated.

And so I'll cue in on interleukin 6 because interleukin 6 is one such chemical that, you can draw somebody's blood, at rest, and measure their levels of it, and it's actually fairly predictive of their incidence, or their risk, of arthritis, five years from now, in their back and in their knee. So if it's chronically elevated, that's a problem. And its elevation also seems to have a relationship with insulin resistance. And so a person needs to understand that they need to do two things to make sure that their body is treating interleukin 6 correctly, or reading it correctly, and to make sure it's not chronically elevated.

But then they actually do want to spike it. They do want to have the acute stress that our bodies are kind of evolved and adapted to deal with, that comes from resistance training and activity. And then they need to eat, and live, and sleep in such a way that it goes back to normal levels, the rest of the time.

It would take multiple PhDs worth of knowledge to probably capture everything that's involved with interleukin 6, but suffice it to say that, it's related to inflammation, and it's an important ... Inflammation is very important. If you couldn't inflame, you couldn't heal from anything. It's when inflammation is runaway, chronically elevated that we deal with problems.

Lawrence Neal: 12:24 Awesome. So if you ... Just thinking about the practitioner, here, who's probably not going to have the depth of knowledge you have about all of that stuff, how would you simplify what you just said, to make it really easy for a client to understand, if they had this question?

Dr. Bryce Lee: 12:40 Yeah. So I think what I would say is that, every day, we deal with, just by walking up stairs, by doing normal activities, our tissues are under stress. And the healthy way that they respond to that stress is, they release chemicals that ask the body to supply them with nutrients, and repair, and etc. If you live a life in which your body fat is elevated, you're not sleeping enough, you're eating poorly, your body's ability to respond to those signals goes down, and then the wear and

tear accumulates. So you want to live a healthy lifestyle, so that your body is sensitive to where the damage occurs, where the stress occurs, and can respond to it appropriately.

Lawrence Neal: 13:24 Perfect.

Dr. Bryce Lee: 13:25 I don't know if that actually is simpler or not.

Lawrence Neal: 13:27 No, it's quite a complicated topic, isn't it? So I think you did a good job, there, of simplifying it. Okay, so moving on to the next question, then. So my surgeon said I'm bone-on-bone. Won't heavy strength training worsen my knee?

Dr. Bryce Lee: 13:44 Yeah. So, imaging is a tough topic, and I'm sure people will have other good opinions on it. But what we see, a lot, is that people go for imaging, and there's a big push to image everything. I'm using MRI. "I woke up with a crick in my neck. I better get an MRI." It's sort of a reflex that we have, and we know, as a society, that we have access to this technology. And we sort of feel like we're being deprived of something if we don't get the full power of medicine at our disposal, to know what's going on.

But when it comes to rotator cuff tears, meniscal injuries, bulging disks, these phenomena are really quite prevalent, and they aren't well-associated with problems and pain. So, in other words, you and I, Lawrence, probably have, between us, a narrowed and frayed rotator cuff, a minor meniscal injury, several bulging disks, and yet, we may be experiencing no symptoms from those things. Those things are just ... In physical therapy, we like to say, when we're trying to calm people down, we say, "Look, those are just wrinkles on the inside. They're nothing to be concerned about."

And I think that goes for a lack of cartilage in the joint. That doesn't mean that that person should take up running, but the last thing that they should do is look at exercise that is safe and appropriate as something that's going to worsen their joint. So let me get into the knee, specifically. When somebody says they're bone-on-bone, A., I wish physicians, physical therapists, I wish nobody would use that language, because that language instills fear avoidance in people. The last thing you want is to get a person to sit down on the couch and never

get up again, and just live a sedentary lifestyle, out of fear, because that's going to, like I talked about with the inflammation, that's going to probably worsen their arthritis, over time.

What you really want is a person to be as strong as possible, as lean as possible. And that's going to put them, both mechanically and metabolically, in the best position to help their joints. So when you have this knee, and they look at it on X-ray, you see that there's ... One of the hallmark signs that we say, for radiographic arthritis, is we say that there's joint space narrowing. When you look at a joint on X-ray, you shouldn't be able to see the cartilage, because the cartilage isn't radiolucent ... or sorry, radiopaque. So what you see is a distance between the end of the femur and the top of the tibia. There's a space. And if that space narrows, then that means that the cartilage is getting thinner and thinner, over time.

If the cartilage ever gets so thin that it can't really do the job of being a friction-free surface for the knee, well, then what's going to happen is, the bone is going to try to protect itself, and it's

going to start to get thicker and thicker, kind of like bark on a tree would respond to stress, or like you would develop calluses on your hand. And that's what your surgeon, or the surgeon, is talking about, or the physician, when they say, "Well, you're bone-on-bone." It's not a very helpful thing to tell a person who's got some knee pain. I mean, better would be to say, "Yeah, you have some arthritis. We need to manage your weight, and you need to eat appropriately, and exercise."

When you say bone-on-bone, it's like Inception, the movie. You kind of put this thought virus into somebody's brain, and it starts gnawing at them, and they don't want to exercise, and they don't want to do anything. But the reality is that, better predictors of how that person is going to do are, how strong is their knee? Because if their knee is strong, they'll be able to control forces better than if they're weak. And then, are they eating in such a way to mitigate inflammation and keep body weight under control? And so if 15 minutes a week of exercise helps them adhere to a diet, and accelerates their weight loss, and keeps their knee stronger, it's very likely to prolong how long

they can function well on that knee before they would need a replacement, if they ever would.

Like I said at the beginning, with imaging, there are a lot of people walking around with bone-on-bone who have no knee pain, whatsoever, and are living their lives, quite happily. And so, because of that, in science, you would look at that, and you would say, "That's not a good predictor, because there isn't a tight correlation. It isn't causal." And there are other people who have adequate cartilage, and yet, quite a bit of knee pain. So the relationship between what you see on image and what is going on in a person's life and subjective experience, is not one-to-one. It's not very airtight. And I just hate when I hear, "Ah, man. My physician told me I've got this bulging disk." It's like, "Well, you know, most of us have those things. That doesn't mean that you're doomed to pain."

So I think knowing that, you don't have to undermine the person's physician. You just have to say, "Hey, look, what do we know about what you're likely to benefit from, over time?" You're likely to benefit from having a really strong

muscular support system for that knee. You're likely to benefit from weight loss. You're likely to benefit from healthy lifestyle, and eating habits, and sleep habits, to mitigate your inflammation. And then, if you do ever end up getting a knee replacement, the stronger you are, going into that replacement, the better, because your outcomes are going to be way better. Your likelihood of getting full range of motion back is going to be way better.

So let's get you strong. Let's work on that side of what we can control. Eat correctly, manage your body weight, and that's the best we can do. You may find that your symptoms improve. And if you do end up needing surgery, you're going to be way better off because of it.

Lawrence Neal: 19:06 Interesting. I did not expect diet to come up as much as it has.

Dr. Bryce Lee: 19:06 Oh, yeah.

Lawrence Neal: 19:10 I mean, I knew there was links with diet to arthritis, but it's really interesting. So just to play devil's advocate, I'm just thinking about that person that comes in with that kind of fear, and

they see a big leg press or something like that, which you're, obviously, encouraging them to use, to strengthen the knee. But what about if they say something like, "Well, I'm worried about a sudden injury."? So they feel like maybe their knee is really vulnerable. How might you alleviate that fear, in the moment?

Dr. Bryce Lee: 19:41 Yeah. So that's something I deal with, frequently. And so I'm a little spoiled. So where my studio is, I have a fair amount of space. I think I have about ... My training floor is about 1200 square feet, so it's comfortable. And because of that, I have a number of pieces. So if a person comes in to me with an extremely sensitive joint, like a knee, and the knee is a common one. I have several people who have started out, one person who was quite young, he was not even 50 and very concerned that he was headed towards a knee replacement. Now he's doing very well.

What I would do is, I wouldn't go to the leg press, initially. And I would say, "Hey, look, at the very least, we can get your hips and calves really strong. Let's do the adductor machine, or the Gluteator, my Dynavec Gluteator, which I love. I

have a Hammer, hip and back, like lying on your back hip extension. Rogers Athletic, the Pendulum company, makes a similar piece called a ... What do they call it? Basically, you're lying on your back, and there's a roller behind your knees, and you're extending your hip to drive the thing to the floor. Calf exercise, maybe a leg curl, because a leg curl tends to be often very well tolerated, even if leg extensions and leg presses aren't.

So I can do all of those things. Maybe before we get to the leg press, or maybe for the first few workouts, and just say, "Hey, we're really going to get your calves and your hips strong, to help compensate, in case there was weakness there and that's why your knee was bothering you." And then we'll say, "Hey, look, it's really important that we start to strengthen these quadriceps. Let's do that with the least weight possible, if you're concerned about your knee. So what we'll do is, we'll get your hips good and tired, first, with these other pieces. And then we'll go to the leg press. We won't need very much weight, and we'll be able to tire your muscles out, without a lot of stress to the joint."

And so, even though we talk about pre-exhaust and whether pre-exhaust is important, from a hypertrophy standpoint, I think it's really, really useful ... No, really. But I think it's a very useful tool, from a joint sensitivity standpoint. I can take somebody whose shoulder just hurts them when they try to shoulder press 225 on the MedX overhead press. And then I can have them do a bunch of other things, first. And now, they can only handle 170, but it doesn't hurt, anymore.

So it's a really useful tool, and I explain to them that's exactly what I'm doing. I say, "We're going to get the same fatigue with less weight," which is what we're all about, here. And once they know that there's, at least, some plan for how to manage that painful joint, that knee, in this case, they're like, "Okay. Well, this guy isn't just some screwball. He actually has ideas about how he wants to address my knee. I feel better," and that helps.

Lawrence Neal: 22:14 Is it also a psychological thing, in that they just seem ... 'Cause once you expose them to this kind of training, in the way of the other exercises

around the knee, that they just develop confidence?

Dr. Bryce Lee: 22:25 I think that's part of it, yeah. Because it's like every successful set is like a victory, in their mind. That they see, "Nothing bad happened to me. And Bryce didn't hurt me," or whoever, "didn't injure me." And so each time that happens, it sort of starts to help the guard come down, especially when you're dealing with a joint that has been painful for a long time. Because I believe we touched on this in our first talk together, but pain is very complicated.

And when you have a joint that has been painful for a long time, you can be certain that a healthy portion of the pain that that person experiences is related to sort of the hypervigilance of the nervous system. In other words, the nervous system is so cautious around that joint, that it sounds alarm bells at the drop of a hat. At any little thing that might be out of the ordinary, they're going to experience pain, even if there is no damage. That doesn't mean that they're imagining anything. It means that their nervous system is really giving them that output, "Hey,

stop that." Alarm bells go off with pain, as a way to keep them from doing new things, because it doesn't trust new things.

And so the more sets and reps, figuratively speaking, you can do, the more times that they can come to the table, work hard, and have nothing bad happen, and especially with muscles that cross the knee joint. Like when you do the adductor exercise, those muscles cross the knee joint. Several of those go down to the other side of the knee. When you do the calf exercise, the gastroc, which is the big superficial calf exercise, crosses the knee joint. So you're getting strengthening across the knee. Then you sort of have to find a way to ease up to the knee extensions and leg presses. But the more successes you can have, the more it's easier for their body to trust you, in addition to them consciously trusting you.

Lawrence Neal: 24:07 Is there also a case for just starting them on something like a leg extension or a leg press, but just putting on a really low load?

Dr. Bryce Lee: 24:16 Oh, sure. And I think that you can find all kinds of ways to make the protocol extremely fatiguing

with the least possible amount of weight. I mean, if you do ... I've seen Discover Strength do this, where they'll have people do a heavy isometric, for a while, and then they'll go into the full range exercise. I don't know if they put you through that protocol, but I've seen them do that on things like a pec fly.

And so you can put them on a leg extension, and just have them bring their foot off of the bottom, like one inch, so that their knee is bent, but it's supporting load. And just say, "Hey, we're not going to move. I just want you to hold it without letting it come back down," and start to impose some fatigue, there. And you can do that for 30 seconds, 60 seconds. But yeah, absolutely. I think there are a lot of times where you're working with a person, and the first four, five workouts, maybe, you're not really sending a hypertrophy stimulus, for those muscles, for the quads, for example. You're just letting them experience the movement and see that nothing bad happens.

And that's very common, especially with older clients who their bodies are so not used to

physical exertion, and especially to the type of exertion where you're pushing into muscular failure. You're going to have sets that terminate long before you know, in your gut, their muscles were really exhausted. And I think that's okay. This is a years and decades journey. We don't have to get them to ... It's not like they're going to prison in six months, and we've gotta get them as big as possible, hopefully. So we've got plenty of time.

And so it's easy to kind of feel like, "Oh, my gosh. That workout, I didn't get her to momentary muscular failure on the leg extension," and that's okay. So long as you're developing that sort of alliance where they really start to trust you, I think that's what we're really after, because that's going to make for years of productive training.

Lawrence Neal: 26:05 Yeah, well said. All right, so move on to the next question. I had surgery on my right knee, last year. It feels fine, but I'm worried that it's not as strong as my left knee. Shouldn't we train it in isolation, so it catches up to my left knee?

Dr. Bryce Lee: 26:21 Ah, yeah. I think this is a philosophical difference in machine design. You have some companies that'll fuse movement arms. You know what I'm talking about? You can imagine a MedX shoulder press, you can't move each arm independently. But on my Nautilus shoulder press, you can. And there's a concern that you might be not addressing one limb if you go to failure, and if the stronger limb carries the weaker limb along.

And so this is tough to try to get buy-in with people, because it is a strong ... I have a client I can think of who makes a deal of saying, "Well, I want to make sure that my right leg isn't weaker." And part of me, without being blunt or mean, I'll say, "Well, you know, we're likely going to have a disparity, there, and that's okay." What we really want to do is get both legs as strong as possible. We'd much rather have both legs be 20% stronger, a year from now, than just your injured leg be 20% stronger, and your uninjured side just kind of be stagnant. The more strength we have, the better. And so-

Lawrence Neal: 27:34 Even if there's asymmetry, which is avoidable?

Dr. Bryce Lee:	27:36	I would say, even if there's asymmetry, yeah. I mean, at the end of the day, we're going to start borrowing from the bank when we're 80, 90, 95, 100 years old. It becomes a war of attrition, and the more strength you ... even asymmetrical strength, that you go into that experience with, in the latter chapter of our lives, the more functional you're going to be. And so I would never shy away from ... Even if I have to look like a hermit crab or something, with asymmetrical strength, I think I would take it. I don't know if you've ever seen the movie Lady in the Water, but there's a reference in there-
Lawrence Neal:	28:07	Yeah, yeah. The guy with the huge one arm, who [inaudible 00:28:11], yeah. Great movie. Great reference, there, Bryce.
Dr. Bryce Lee:	28:14	It is, yeah. And, I mean, that's, obviously, quite an extreme case. But I'll say a couple things to that person, or that patient. I'll say, one, if I train your legs in isolation ... Like, let's say I put ... There's a great machine. Pendulum makes a great leg press called the Seated Squat Pro, and you can choose whether the legs will move independently

or dependently. Did you get a chance to use that piece, this week, when you were out there?

Lawrence Neal: 28:43 I did. I did. I enjoyed the torture on that particular piece, and I was pre-exhausted by leg extension.

Dr. Bryce Lee: 28:50 Oh, yeah. So you can choose to fuse or un-fuse the movement. And what happens is ... Let's say your one leg was much stronger, well now, you have to ... Basically, you're going to work until the weaker leg terminates. Because what's not going to happen is that you're going to fatigue out your left leg, but your right leg is going to be able to keep pushing. The whole asymmetry imposed on your body, you're going to feel too unstable if your one leg puts the weight down, and your right leg keeps pushing. So, really, it's kind of like, as soon as the weaker limb is done, the whole set is done. Everybody is done. It's almost like, do you teach to the smartest person in the room or the slowest person in the room? It's sort of an analogy.

If you fuse the movement arms, then when that ... Let's just pick the left knee, my left troublesome knee. When my left knee has no more gas, my right knee does, and so can keep pushing. But

then that allows my left knee to continue pushing and fatiguing longer than it would otherwise. So you got two choices. You can train the legs fully in isolation, and that just takes time. More time, because it's a whole other set. Or you can fuse the movement arms and do it together, and hope that the bigger muscle, the stronger leg, is going to carry the uninvolved leg into a deeper degree of fatigue.

The other thing that you'll see, a lot, though, is that a person with a troublesome knee ... We'll just keep centering on the knee, is going to actually experience inhibition and anxiety when they try to do a unilateral, a one-legged leg extension, for example. They'll go to try to do it, and it'll feel like they just can't work very hard, they just can't dig in and contract, because again, their body does not trust this, what's happening. It's a very threatening, anxiety-producing experience. They feel like there's going to be-

Lawrence Neal: 30:35 It's off balance, isn't it, almost?

Dr. Bryce Lee: 30:37 There's that, but it's also like their body is on high alert, waiting for the slightest twinge of pain

that might occur. And if that twinge of pain occurs, what do you do? You're still under load, whereas, if you go with both legs at a time, your body knows and you know, but really, I think it has to do with your nervous system's actual perception of the threat. Your body knows that if there's a twinge of pain in the left leg, my right leg has it. Worst case scenario, my right leg can put the weight down. And that comfort, and that ability to trust the exercise, allows them to work very hard, where they might not be able to work as hard otherwise.

And then there's all kinds of issues where, let's say you have a meniscal injury or some kind of problem in your knee, and it's an old injury, and you've been dealing with it. People can kind of have very awkward range of motion. There'll be almost a catch. Not a catch, in that there's a piece of meniscus that's getting caught between the bones and it's getting stuck, but more like their nervous system is having a tough time coordinating the movement of extending the knee.

That seems so simple, right? A knee is a hinge, isn't it? It should just swing up. But a knee is actually a little bit more complicated than, say, a hip, which is just a simple ball-and-socket. There's a lot of coordination that has to go into just straightening your knee, because it has to kind of bring that tibia up and around the front of the femur, and there's a lot of muscles that are working in synergy to make that happen.

And if, for example, your hamstrings are trying to help you by co-contracting at the wrong time, then you can really get stuck. And I've had patients who, I know that they're strong, but sometimes, they'll walk in and they, literally, cannot straighten their knee against no resistance, just sitting on the edge of a table. And then you warm them up, and you fatigue out their hamstrings, so their hamstrings aren't fighting them. And all of a sudden, they can just bring their knee up with no problem.

Lawrence Neal: 32:21 Oh, wow.

Dr. Bryce Lee: 32:21 So being able to have the other leg, to ensure that the range of motion goes smoothly, it can really allow for more effective muscular fatigue on

the involved leg. So, most of the time, I tend to shy away from unilateral training. You know, maybe I'll do a unilateral leg press, sometimes, but I don't like a lot of unilateral, especially, pushing exercises. Really anything. There's very few cases where I'll ... Other than, once in a while, if somebody, if they don't have any kind of neuromuscular problems, like they had a hip replacement, and that was a year ago, and we're really just trying to ... Maybe then I would try a unilateral leg press with them.

But for the knee, I really just like to keep it bilateral, and really get to the deepest level of fatigue we can get. Because, either way, when they hit that point of failure, both legs are pushing as hard as possible. And so both legs are going to get the deepest amount of fatigue we can get.

Lawrence Neal: 33:19 Awesome. Great answer. Cool. Okay. So, number four. Stretching makes my knee feel better. Does that mean I'm tight and need to work on my flexibility?

Dr. Bryce Lee: 33:31 Yeah. So we've talked about pain, a little while ago. We kind of talked about the threat and how certain movements might sound alarm bells. And

one of the things that a joint like that, a chronically painful joint, thrives on is input. Any kind of sensory input that is non-threatening sort of serves to tip the scales away from threatening. So what do I mean? That your nervous system is on high alert. It's looking for a reason to sound alarm bells and say, "Hey, stop doing that in your knee. Hey, stop moving your leg that way. Don't climb those stairs that way." And so the more input you can inject into the system, the more you can sort of get the nervous system to calm down.

This is why people wear knee sleeves when they play sports. Are they actually correcting motion? Probably not, but they feel good, and that's okay. And this is why, when something is sore, your instinct is to rub it, in a non-threatening way, to stimulate the nervous system around that joint. Because the more you do that, the more you're sort of exerting a pressure towards kind of recalibrating the system, so that it's not so paranoid. So stretching kind of falls into that. Exercise certainly does.

But if a person feels the need to stretch, I'd tell them, "Hey, look, our nervous systems crave stimulation. And so if stretching makes your knee feel good, you should definitely do it." I don't think it's helpful to try to stretch really aggressively, and try to feel like you need to improve ... to try to feel like you need to force improve range of motion. If you stretch regularly, and you feel like your range of motion is improving, hey, that's great. I think we're more likely to see good range of motion improvements when we strength train through full range of motion than simply by stretching.

I will tell people, "Hey, look, how flexible you are is largely neurological." If you stretch, and stretch, and stretch, you're not forcing your body to grow more sarcomeres, more muscle elements, to strip the length of the muscle. What you're doing is, you're teaching your muscle that you want it to be comfortable relaxing longer. So the length doesn't really change, but where your body will allow it to relax to, can change, and that's plastic. And so you're sort of saying, "Hey, I want you to tolerate being elongated, a little

closer to your tolerances, to your limits." That's what you're telling your body to do.

So stretching is very neurological, both in the adaptation that you get from it, the improved flexibility, for the most part, and in what it does to calm down your [inaudible 00:36:13]. So if somebody says they want to stretch, I say that's great. You can go ahead and do it. Here's what it's probably doing for you. It's probably calming your nervous system down, which is totally appropriate. And just don't feel like you need to hammer away at the stretching and aggravate anything, because that's more likely to undermine what you want.

Lawrence Neal: 36:30 So what causes people to say they feel tight, in the first place? I don't, still, fully understand that.

Dr. Bryce Lee: 36:36 Yeah. So that's actually an interesting research question that people have explored, is that sort of feeling of stiffness or tightness, and it's very common in the back. It seems to have no relationship with actual stiffness. And when we say stiffness, we're talking about when a tendon becomes stiff and responds to training, where it deforms less, under stress. It's more resilient to

stresses. So when we're talking about stiffness from a material science, mechanical engineering, biology perspective, when we're looking at what happens to the tissues, somebody saying they feel stiff and reporting feelings of stiffness doesn't seem to relate to whether they're actually stiff, in that their tissues don't elongate correctly.

What is more likely is, it's related to, again, that nervous system saying, "Hey, look, right now, I'm not really comfortable letting you move in that direction. And so I'm going to give you some sort of inputs that make you feel ... " In the same way that your nervous system makes you feel pain when it wants you to move your hand off a hot stove, that's an output that it sends to your frontal cortex, your conscious brain, to get you to act. At the same time, you have reflex arcs, that are pulling your hand away quickly. But you sort of get this pain experience, which makes you behave in a certain way. Your nervous system has all kinds of tools like that.

And one of those tools is stiffness, where your body, basically, say, "Hey, you're stiff. I need you to move." And it'll sort of motivate you to want to

get up, and move around, and improve your circulation, and add some input into the system, and kind of recalibrate things. So it's almost like you're ... We don't like to think of it in this way, but we're almost like on the end of marionette strings. And sometimes, we wish we were in control, but really, our lizard brain and our central nervous system is driving a lot of our behaviors. And one of the ways it'll do that is by giving us these sensations of stiffness, and pain, and etc.

Lawrence Neal: 38:31 Cool. Awesome. All right. So, final question. If you've got some time, I might just throw some random ones at you. I really want to be doing some exercise outside of the studio. What can I be doing that won't interfere with our workouts, here?

Dr. Bryce Lee: 38:49 There's definitely a purist approach to this, which would be, "Hey, look, you know, I really want you to be resting, especially your muscles, in between." But you start to see this. I guess this is what Doug McGuff would call the active phenotype, this idea that you're going to have people who are going to start to want to become more active. I am never going to tell somebody

they need to stop doing pushups, in between our work, or stop doing lunges, or whatever it is that they like to do. A., because you just don't want to be a downer on your people, but B., because I really am skeptical that it's going to undermine their training.

If a person is leg pressing, three days a week, heavy, then I'll have a conversation with them about how they might be undermining their results. And if they have a bad workout, and then they take some time off, and they have a good workout. And I ask them about their activities, and I say, "Oh, you mean you did Pilates, pretty hard, four or five days, last week, and you weren't really feeling well, working out? But then, this week, you took some time off from Pilates and you were doing better? Well, then, maybe you were pushing the limits of what you're able to recover from, a lot, last week, and maybe you can kind of think about that." So, rather than saying, "Don't do Pilates," I would say, "Hey, just understand that you have finite resources."

But as far as what they should be doing, I ask them if they walk regularly. That's the first one.

Not because I think that ... I think that stillness is the problem, and I think that where our circulation really thrives on movement, and walking, and things like that. I ask them what they're interested in. Sometimes, they feel like they have this sense of guilt, where they're like, "Well, I'm not doing any cardio, and I know, deep down, that I should be. And so I must be doing something wrong."

Lawrence Neal: 38:49 How do you answer that one?

Dr. Bryce Lee: 40:27 Well, you know, we have a big conversation, an ongoing conversation throughout the training, about how your heart and lungs respond to stress and what kind of stresses they care about. Whether or not they need ... Whether or not there's a difference between the oxygen debt and the CO2 surplus that happens from running up a hill or performing a hard set of leg press. Pretty quickly, though, once people start to get strong enough where they're actually getting out of breath, I think that settles itself pretty well.

When clients are new and they're very weak, some of them have a tough time ever feeling out of breath. But once they get to the point where

they're handling a meaningful weight for their body, they're huffing and puffing, and they're like, "Oh, I see what you mean. This really could be my cardio training, too." People are kind of hip to the idea of intervals, so they already have ... many of them have, in their minds, the idea that brief, infrequent training that makes them out of breath can do the job. And then you can just show them that this does that, as well, but it takes a little while to get there.

But I try to help people understand, the elliptical isn't the thing that's going to prolong your life. It's just being active, strong, and lean. So what are the things that you wish you could do? What are the activities that you miss doing, that you did when you were a younger person, but now you've been too busy working? And I try to encourage them to adopt hobbies and ... Or whether it's tennis, rock climbing, grappling, martial arts, whatever it is, I encourage them to do those kind of things, over and against just ... Now, if a person just loves running and wants to do marathon running, that's fine. I'm not going to try to talk them out of it, too much, maybe a little.

But I will say, "Hey, I think your body's desire to be active is great. You shouldn't feel some deep sense of guilt at not doing 30 to 45 minutes of steady state cardio, each week, because there are much bigger predictors of how well you're going to age and do, such as how lean and strong you are, and your desire to be active is great. Let's be active with something you actually love." Because if I tell you, "Hey, I want you on the elliptical, three days a week," you're going to do that for, maybe, two weeks and then quit. Or you're going to do it for three years and hate me for it. But if you pick up something that you love, you're going to be consistent with it.

As far as actual strengthening exercise, I do try to be pretty comprehensive. If people are really interested in that, or if they have back issues, I might show them ... or shoulder issues, actually. I, really, kind of use this as a pretty versatile tool. I might show them some kind of quadruped exercises they can do, sort of like crawling variations, on the hands and knees. Not because I think there's anything magic, there, but I've rehabilitated my own back, and also had a lot of success with shoulder rehabilitation by

incorporating more time weight-bearing through the hands.

And so, as an adjunct, as a kind of a complement to a routine, I don't force it on people, but if people are really interested, or if they tell me their back's bothering them, I'll teach them just a really simple five-minute routine they can do with that. And I'll check in with them and see if they've been doing it. Compliance is tough. They'll say, "Well, I'm interested in doing something." And so I'll show them this really challenging thing to do, and then they're like, "Well, I did it, once or twice." Some of them stick with it, though.

But I don't think that there's anything super magical about that. I would much rather see them adopt a new, not-too-stressful, but enjoyable sport, that they're likely to stick with. Partially, also, because then, once they find that sport, then it becomes another sort of ... It's sort of self-serving. "I forgot how much I love tennis. I want to keep playing tennis. I want to be strong enough to keep playing tennis." So I can help them with that.

Lawrence Neal: 44:11 Just, whatever you do, don't encourage people to play basketball. It's not a good idea.

Dr. Bryce Lee: 44:18 Is that your ... Have you been paying the price for it, sometimes?

Lawrence Neal: 44:21 Well, once a year, at the moment, I seem to get a pretty bad injury. So I tore the calf December, 2017. And then, just over a month ago, I sprained my left ankle, really badly. And I did it by driving to the basket, was guarded by someone a lot bigger than me, and they kept with me. I faked them, to send them up in the air, 'cause they would block me otherwise. And then I went up and they kind of recovered. But then I had landed on their foot.

So I sprained it coming down, as opposed to moving laterally, or something like that, which meant that, I guess, all my weight was coming down on it, as well. And it felt like it went both ways, side-by-side, so it was pretty horrible. And yeah, I was on crutches for, I don't know, four days. And then all I could think about was, "Oh, no, I can't leg press at REC." And that, literally, was all that was going through my head.

Dr. Bryce Lee:	45:17	I bet it went okay, though, didn't it?
Lawrence Neal:	45:19	What do you mean, the leg press?
Dr. Bryce Lee:	45:21	Yeah, were you able to leg press, after all?
Lawrence Neal:	45:23	Yeah. I was amazed, just how quickly I recovered. I mean, I was walking after ... I mean, I thought I had broken it. Like, in the moment, I actually thought that I had done serious damage. And all I had done is just torn the ligaments, I think, based on the swelling and what the doctor said. And yeah, I mean, I was amazed. Like, I don't know, a week and a half, I could walk. Well, yeah, in a week, I could walk on it, quite well. Maybe even shorter. Maybe it was four or five days, actually. And then, by the time the conference came around, which was about a month later, I could ... You know, if I tilt my foot left, my left foot, if I tilt it, I can feel it. I can feel slight pain. So I just told the guys at Discover Strength, at the conference, I said, "Look, you know, I'm happy to do ... I think I can do heavy loads on my legs, but ... " I just said, "Look, I've had this. You're the expert. You tell me if you think I'll be okay, 'cause I haven't leg pressed, in a month."

And I did, obviously, a leg extension, which was fine. Leg press on the Pendulum machine you talked about, earlier. And then I did ... I don't know what they're called. I called them crabs, but there's probably a better label for them. Where you have a resistance band across both feet, and you're kind of moving sideways in a crab-like movement. Is that what that's called? What's that actually called? Do you know?

Dr. Bryce Lee: 46:43 Oh, I mean, you could call them band walks. I mean, I've seen them called that.

Lawrence Neal: 46:45 Okay. Band walks.

Dr. Bryce Lee: 46:46 But sure, I know exactly what you're talking about. Yeah.

Lawrence Neal: 46:52 So I did that, but again, I told them, "Look, you know, I've had a sprained ankle," so he put the easiest band on me, which I still found very challenging. But yeah, it was fine. I mean, I don't know whether that's a testament to strength training, and how quickly I recovered. I mean, maybe it's 'cause I'm only 31, I don't know. But I was very surprised. Very surprised.

Dr. Bryce Lee:	47:12	My wife sprained her ankle, pretty badly. One of the kids had something on the floor, and she just slipped and rolled it. And it ballooned quite big and swelled. And, again, same thing. She recovered, fairly quickly. I mean, that's an injury that is a pretty common one. People recover pretty well from it. But maybe you and I, what we'll do on here, we'll just clap each other on the back and say it's because we know how to strength train appropriately.
Lawrence Neal:	47:40	Yeah, I'm, obviously, biased, and obviously, going to use that to support what I do.
Dr. Bryce Lee:	47:45	But as far as ... Yeah, it's tough. I mean, I don't try to encourage ... Usually, rugby isn't the first thing I encourage people to go play. You know, I try to say, "Hey, if there's something you already love to do, maybe, why don't you do that, again? Why don't you find a way to reincorporate that?" Maybe it's golf, or tennis, or something like that. For me, I either do rock climbing or grappling, and both of those things beat me up, pretty bad, occasionally. But what are you going to do? You love what you love.

That's why I think it's so negligent. It's really easy to teach a client to love something. And so if you're going to teach a client to love power cleaning, you better be careful, because a person can really start to love it, as they become proficient at it. What did Luke say, that the more you learn about something, the more passionate you become about it. And I see people, all the time, have no interest in weightlifting, and then their trainer teaches them the weightlifting, which is fine. And then they fall in love with it. And then they're frustrated and beat up, because they can't do it, 'cause they're injured. And now they're mad, and they just can't wait to get back at it, again.

And, you know, that's fine. We're all going to find sports, or many of us will find sports. We'll have the itch. We'll have to find a sport. But you just have to be careful what things you teach your clients to fall in love with, because they will. If they get good at it enough, and they learn the technique about it, and learn all the nuances to it, especially if it's a complicated lift, like an Olympic snatch or a clean, it's easy to be like, "Oh, man, this is really addictive to get good at it." And it's

just sort of like there's sort of a burden on the trainer, to be careful about what you want to expose your clients to. I feel that.

Lawrence Neal: 49:24 That's so true. I have a friend who's never really been into exercise, his entire life. And over the last couple years, he's got really into CrossFit. And you've been an ex-CrossFitter, so you can probably relate to this. He's built a fair amount of muscle. He's always the type of guy who's got a big frame, and was always going to be a good responder to that kind of thing, and do well at it. Do well at, such as anything lifting-things-heavy-related.

And I, rather than ... Well, I did, at first, try and take the higher ground and say, "That's great, man. I'm glad that you found something you really enjoy, that's exercise-related." And then I think we had had a few drinks, and then the truth started pouring out of me. And I said to him about high-risk it was, and the injuries. But he didn't want to hear any of that. I mean, he was so ... Even though he's a smart guy, all he could think about was how he could rebut me and continue to have this conviction to do what he

wants to do. Because, like you say, it's something he's become very proficient at, and something that finally he's found an exercise modality that he enjoys.

Dr. Bryce Lee: 50:37 So when I have conversations with those people, I just delineate, very quickly. I say, "Hey, that's really cool. CrossFit is a really cool sport." And I just frame the discussion, and saying, "Look, let's make no bones about it. There are rules, there are techniques, there are competitions. You're competing with yourself. The focus is external. The focus is on how many reps, how fast, this and that. It's not internal. It's not, "Hey, did I get my heart and lungs to X level? Did I get my muscles this fatigued? So it's externally focused, rules, competition, it's a sport, and that's fine. And if that's a sport that you love, that's great.

If you want to get really good at that sport, I bet I've got some tips, and you could come to my studio and you could try this approach, and it might even make you better at CrossFit." You can frame it that way, too. Really. "I mean, if you want to be able to find that low-gear, incredibly

deep ability to recruit muscle under fatigue, there's some things I can show you." And that's kind of how I'd converse with CrossFitters, rather than getting into the ...

And then, after a while, if they ... If you just look at it as an adjunct, as another cool thing to learn about, and you can kind of, of course, be like, "Hey, well, if you're tough enough, we could even do the leg press." Because they're ego people, like we all are. But they love to perform. And I actually have a ... I don't know what will become of this, but I have a physical therapist and personal trainer who has heard about me through a friend, and is interested in coming and checking the studio out. And I'm looking for an employee, and she's looking for some part-time work. And so she's going to come by, but she's an avid CrossFitter, a certified CrossFit trainer, etc. So we'll see how that goes. It'll be a fun conversation, even if nothing ... even if it doesn't go anywhere.

Lawrence Neal: 52:24 Yeah, I love the way you address that, though. That sounds ... That would be far more diplomatic. Bryce, this has been a lot of fun.

Thank you so much. I think you've just given some excellent advice to a lot of the members on how they can address these challenges in their business, 'cause we all get them. And I'm going to be listening to this back, a couple of times, 'cause I just think it's really, really valuable. What is the best way for members to find out more about you, and contact you, and that kind of thing?

Dr. Bryce Lee: 52:56 So I'm trying to become more active, again, on Instagram. We were really active, there, for a while, and then I've just been very busy, the past few months. LinkedIn is also good. I'm trying to concentrate some effort there, as well. You can look me up, Bryce Lee on LinkedIn. Instagram is StrengthSpace, with no spaces, StrengthSpaceVa. And then our website is strength-space.com.

Lawrence Neal: 53:20 That's awesome. Cool. All right. Well, look, thank you very much for joining me, or joining us. And I'll let you shoot off. I know you've got a client coming, and you probably need some time to just get into client mode. But I just want to say

		thanks again. I really enjoyed it, Bryce. And looking forward to catching up with you, soon.
Dr. Bryce Lee:	53:40	Great. Yeah, it was a good time, Lawrence. Thanks so much for having me.
Lawrence Neal:	53:43	You're welcome. Take care, Bryce. Bye, now.
Dr. Bryce Lee:	53:45	All right, bye.