Academy of PHYSICAL MEDICINE

Transcript

Athletes and Sports Injuries With Clive Lathey

Cast List

Steven Bruce	SB
Clive Lathey	CL
Steve Adams	SA

SB: We're going to be talking about sports injuries. We're going to be talking about elite athletes. We are going to be talking about recreational athletes and to do that, to help us understand how they differ, what sort of injuries that they might suffer and how best we can cope with them in our clinics. I have got somebody who is the go to man for elite triathletes certainly, if not all other athletes in the country. Clive Lathey who comes to us from the Putney clinic in London. Clive, great to have you in the studio. Thank you for coming to join us.

CL: Thank you. I'm honoured.

SB: Clive is himself a triathlete and a golfer.

CL: Not a triathlete.

SB: Sorry. Not a triathlete.

CL: A cyclist raising money.

SB: A cyclist raising money for... I do beg your pardon. Well he'd like to be a triathlete. He's a sportsman himself. Let's put it that way. He's done a lot for charities. He's done stuff for multiple sclerosis. He's part of the Lawrence Dallaglio charity foundation and he has a litany of stars to his credit. Are we allowed to give names to all these stars that you treated Clive?

CL: Probably not.

SB: But you've got some elite guys from the stage, from the music industry and so on.

CL: It's a mixture of when I used to work in the West End, a mixture of actors and when I worked on West End productions.

SB: I was going to ask how you managed to attract all these people because actually having the osteopathic or physical problems they might present with are no different to anybody else's, but actually when you can say you treated them for some reason, the public think you must be a better practitioner if you can.

CL: Well, yeah, possibly. Yes. I mean the thing is, when you're treating the acting fraternity, they all speak to each other and it's not long before you accumulate quite a good range.

SB: I didn’t mention in that intro, of course, is you've been an osteopath for over 37 years now. Working in the NHS and various other practices. In fact, you told me only just a few minutes ago, you've only worked in a purely osteopathic practice for four years in that time. Most of it has been in multi-disciplinary or NHS context.

CL: I worked for Barrie Savory in the West End for four years, which is where I got introduced to a lot of the West End productions. And then I worked in Australia, in New Zealand for various osteopaths, osteopathic clinics. But since I came back to the UK, I've been in five GP surgeries. I'm working on Lister outpatients, Lister hospital outpatients with consultants.

SB: I know we want to get onto doing the sports injury stuff, but I suspect a lot of people are really interested in that interaction with GPs, because actually it's quite hard to get to work with the NHS as a chiropractor, as an osteopath. When you say you're working in their surgeries, does that just mean they are renting out a room to you and you go in and never see them, or you're working in close communication and cooperation with them?

CL: When it was fund holding GP contracts. I did have a contract for 10 years when that changed and they were cutting costs. We lost that. But I now rent space in a NHS building, which has 21 GPs, it's a huge building. And there's a private hospital at the top part and we've got the second floor. So we've got six treatment rooms and a gym and a studio, Pilates.

SB: Sounds fantastic, but does that mean that you actually-

CL: Expensive.

SB: Get some communication with all those people as well, so that the people who would formerly have referred to you through an NHS contract are now referring to you anyway, but just privately?

CL: It is quite difficult because the GPs have such short consultation times. We don't get as many referrals as I would like, despite the fact we've spent a lot of time doing CPD for them. Ironically, we get a lot of referrals from GPs outside of our current clinic, but we do get a lot of referrals from surgeons and other consultants. Mostly through insured patients.

SB: Okay. So that's how you made all your connections with lots of elite stars of stage and music. I mean, what about the connection with elite athletes? Where did that start? Because you worked with Liverpool football club haven't you?

CL: Most, as in life, is who you know. I wasn't headhunted as such. Liverpool came about through me treating someone who is the finance director and he introduced me to the medical staff and I spent a season there when Rafa Benitez was the manager and that was a great experience going there every few weeks. With golf it was through a doctor I know who introduced me to Montgomery, because Montgomery had a back problem at the time. So it's really been through contacts and the same with the Saudi Arabian Olympic team. I was treating the president of the team so that gave me an entry into that.

SB: You were their osteopath for the Rio Olympics was it or the London Olympics? I can't remember what you said.

CL: Rio Olympics. London Olympics I worked for the IOC, which was a team of osteopaths and chiropractors working with the physiotherapists in the walk-in medical center. And that was in the village and that was a fantastic experience to work all together in a very cohesive way.

SB: So a lot of people who are watching this this evening, will probably not consider themselves to be specialists in dealing with athletes or sports injuries and so on. Do you think there's a big stretch of one's training experience or imagination to specialize in that way or to adapt one's normal skills to dealing with elite or recreational athletes?

CL: I think that it's an advantage to do further studies. And I did a master's degree in sports medicine and biomechanics, which definitely helped a lot. If you didn't do that, I think just attending plenty of orthopedic conferences, especially on sports medicine, there's a lot of those around. And very often a lot of the injuries you see are just an extension of day to day injuries. Just

there's more load and also more trauma. But you do need to have an awareness of the sport you're treating so you understand some of the forces and loads and what's likely to result in injury.

SB: Is it possible for you to determine where you see most of the injuries? Do they occur more in elite athletes or more in recreational athletes? Because clearly they both have their own...

CL: Yeah, I think depending on the sport, but certainly recreational athletes are more prone to injury overall. Elite athletes have got a massive support team. If they're full time athletes, they have everything they need and they've plenty of recovery time, plenty of all the latest advice and help on nutrition and training and so forth. Recreational athletes have the major problem that most people are working in sedentary jobs and they're compressing their sport. Very often they become weekend warriors, which is a major problem and a lot of people are obviously sitting at desks and computers. So you get this postural and adaptive shortening of muscles and you get injuries that are labeled as sports injuries.

But actually in reality they've been created in the sedentary environment and in the office and they manifest themselves when you're doing sport. And the classic example would be something like tennis where people are sitting on computers in a hunched posture with a mouse and they're doing this day in, day out over a long period of time. You start seeing shortening of pectoral muscles, minor and major. And then you start seeing subscapular muscle dysfunction. And then when they're holding a tennis racket and playing tennis, they end up with impingement syndromes or very often further down the kinetic chain, lateral epicondylitis and other soft tissue injuries. So it is a challenge for a recreational athlete to be able to fit in enough time to get themselves fit and cross train so they don't get injured. And it is difficult and particularly in the sport that I really interested in, which is triathlon, you've got an even more of a problem.

You've got three sports being compressed into short periods of time and people do struggle to try and fit everything in. You've almost got to have no friends and certainly not be in a relationship if you want to try and train effectively and remain injury free.

SB: What's the current philosophy about training for triathlon? I seem to remember years ago people said you had to do two disciplines every day or something.

CL: It depends on which model you've followed, but you certainly need to be doing... I mean in reality you've got to be doing exactly two of the sports every day and you've got to try and fit in time to cross train, doing core work, doing individual strength and conditioning. And you've got to allow enough recovery time and get enough rest and that's another issue. Triathlon is

particularly challenging and particularly if you're doing Iron Man ultra distance stuff, it's very difficult.

SB: Well an Iron Man is basically a whole half a day solid of exercises, isn't it?

CL: It is.

SB: A lot of people.

CL: Yeah, and the build up to that. You've got to do huge amounts of training to get to that point. The problem nowadays, is not content with Iron Man. We've now got these ultra ultra events and I've got someone I'm treating at the moment who does Arch to Arc, which is Marble Arch to Arc de Triomphe. It's a run from Marble Arch to Dover, which is 90 miles I think. A short rest, a swim across the channel and then a cycle to Paris. Well I've done a relay across this channel and I've cycled to Paris. I certainly haven't done the run to Dover and that was hard enough and you try and do that in one go and train that level and it's no wonder people are getting more injuries. There's just not enough recovery time when we're pushing the boundaries and the bell curve.

We're going further and further to the right into the injury zone and there's more and more of these events. They're getting more popular actually. And there's a Norseman, some mad event in Norway, which I was reading about, which is even more punishing.

SB: Which is presumably in the cold as well as long distance...

CL: It's cold and the distances are mind boggling.

SB: So where do you want to start in talking us through dealing with athletes at any level? You want us to talk about the physiology behind it all or?

CL: I don't mind. I think one of the quotes... But let's talk about the sort of physiology because one of the things that most recreational athletes struggle with is how fit are they and how much should they be doing. And people, obviously there's a lot of information on the internet and it's sometimes very hard to sift through fact from fiction.

I think you do need some form of matrix to be able to get a base level of improvement. Fortunately there are a lot of gadgets you can buy nowadays that makes that a lot easier. There's Fitbit watches, there's Garmins that you can put on the bike. When you're running, you can have ergometers that tell you how many steps you're taking, how much load you're putting through the body.

SB: So for the recreational athletes, and I'm talking about the armchair athlete, well not the armchair athlete but the low end, I think someone who just

wants to keep fit as opposed to compete at an international level in Iron Man. Are those things still really relevant?

CL: Well it depends, I think people are faster, they do want to have some idea of improvement. I mean it's obviously instinctive at the very simple level. You know that over a period of time you can speak when you're running and you can have a conversation on a bike going uphill, which you couldn't have when you started training. See you get some sort of basic indicators that you are getting fitter and over time, provide you keep some sort of continuity in your training program, you will instinctively know you're getting fitter. But I think if you want to make it a bit more analytical, a bit more objective, you don't have to have the complex laboratory tests, which is what the extreme testing of the elite athletes. But you can buy, as I say, you can buy gadgets to make it very simple actually.

SB: So what do you see as being the osteopaths or the chiropractor's role in this? Because most of us are not sports coaches. Most of us might know the existence of heart rate monitors or stuff that you've mentioned already. But in terms of advising an athlete at any level or everyone how to use those and what ranges they should be training and do we have a role in that or do we simply have to know who to speak to?

CL: I think if you do want to be able to advise a recreational athlete on what's out there, and if they do want to step up to a kind of club level, then you want to be able to be able to have a conversation with a coach or a personal trainer. I think it's about having an awareness of what is out there. We don't have to be exercise physiologists, but I think a basic understanding about what max VO2 means and what the lactate threshold test is, that sort of stuff. At least you're then speaking the language and then you can explain it to your patient, which is another bonus. You can tell them what sort of things they can do.

SB: So tell me about VO2 max then?

CL: It's just a measure of the efficiency of your heart, lungs and muscles to utilize oxygen when you're exercising. And in an elite athlete it's about 85 to 90% max VO2. And it does give you a measure actually of your level of cardiovascular fitness.

SB: How is it measured?

CL: If you're doing it in a laboratory then it's done with gas analysis. There is a calculation, I think I have it on my slide, which is...

SB: I did see it on one of the slides.

CL: And that's, if you're doing it at a basic level, you can do it based on heart rate. And I don't know if we've...

SB: No, I'm not sure if we'll be able to get this one up.

CL: Yeah. So there are simple ways that you can do that.

SB: Wrong slide. So simple ways. As I recall, it was measuring your heart rate when you immediately wake up in the mornings.

CL: Yes.

SB: Sort of base level-

CL: Before you get out of bed, over a minute, you can measure how many beats per minute you have and that gives you a sort of base level. And then you can do incremental training on a bike. So you can test your heart rate at five minutes, 10 minutes, 15 minutes. And I can't remember off the top of my head how you do the calculation, but it does give you a rough idea of your max VO2, which is not as accurate as a laboratory test but...

SB: But that is in part in your presentation, which of course we'll put on the website for people to look at, at their leisure after we finish this, as part of the recording. Is that the sort of thing that you would provide to a normal, a recreational athlete and say, go and do this? And having done it, now what do they do to improve it? Is it just train harder or would you advise them specifically on what sort of training they should do?

CL: I do. In my presentation it talks about different types of training techniques and polarized training where you basically spend a majority of time training in zone one, which is high fat oxidation where you're going at a constant level. And then there's certain amount of time spent doing intensive exercise to push up the anaerobic...

SB: I think we have one of your slides which shows us a zone one and zone two and zone three. I'm sorry you keep talking when I try and find it because I'm sure I saw it somewhere.

CL: I mean if you're doing 10 hour week training, you'd spend seven hours in the zone one which is the fat oxidation doing for distance and then you spend two and a half hours, intense burst of training and then probably half an hour of zone two which is sort of mixture of the two.

SB: I mean you won't be able to read the writing at home, but we will, as I say, put it as part of the download. So we've got the three training zones, one, two, three and then you've got some typical measures along the top line there which you were telling us about.

CL: I mean it just gives, even the recreational athletes, gives them an idea of varying the training. So you're not just going out and cycling willy nilly and not with any sort of direction. So if you're going out for a long distance ride,

you'd be in zone one. If you're doing a cycle fit class for example, you'd be doing interval training. So you'd be really pushing yourself to a point where-

SB: It says in the subject of column very, very hard. You won't want to stay in this zone for very long.

CL: No. You definitely don't. And you'd probably feel very nauseous and that's really pushing it. But you need that. I mean it depends. If you're a recreational club level then you would need this training because you'd need to be able to sprint finish. If you're doing what I'm doing, which is, I'm almost always in zone one because I'm just raising money and we're just going a long way each day. So I'd stay in that. I do train in zone three just to try and push my fitness up because we do a lot of mountains. But if you're doing at a club level, you definitely need to be training all these three zones. Because if you're competing.

SB: Okay. And then you also talked about lactate threshold a minute ago?

CL: Yeah. That's the point where lactic acid is accumulating in the blood as a result of exercise and it's being removed and being produced at more or less the same level. So you hit a sort of equilibrium. And that's another test which is a good way of analyzing your improvements. So this will be early season, you can see and you using-

SB: Early season is the blue line?

CL: That's correct. And you're basing it just increasing your power wattage, you get to that critical point where the curve projects upwards and then you're really starting to push the lactic acid into the bloodstream. And as you get fitter, you're moving further along the Y axis. And that just gives you another matrix to see and measure your improvements in fitness.

SB: Measured by what method?

CL: If you're doing it professionally, then you'd have blood analysis, which is quite a challenge. I mean you can do it on a bike and running. Swimming's, obviously they do do it, but it's... So they take a blood sample at different stages of your training and do a biochemical analysis and they'd see it that way. When you're doing it on the cheap version, that's again, I think it's on one of the other slides if you've got it on there. Because off the top of my head, I can't remember the process, but it's a...

SB: We'll have a look.

CL: Similar to max VO2.

SB: It's an alternative test it says, for...

CL: Yeah, here's the alternative test. It's another way of doing it. So again, you're using time, distance, heart rate. You'd warm up, you record the heart rate at 10 and 30 minutes. You add the two heart rates, divide by two and that gives you the lactate threshold heart rate. And then you do the average pace over 30 minutes. So it gives you a lactate threshold pace. So this gives you another matrix, which it's inexpensive and you can do that yourself really. And then there's this new high tech methods again, which is some of these gadgets are available.

This one's a led light sensor you wear around the calf and actually reads the concentration of lactate in the blood. I don't know how it does it, but it was quite-

SB: But cheap enough for the recreational athlete or serious?

CL: If you've got enough spare. And a lot of the recreational triathletes tend to be this sort of 35, 40 age group plus and they do like to spend money on bikes and gadgets. So that sort of thing would be quite appealing. And then you've got the smartphone apps, which again calculates lactate threshold and pace and heart rate. So you've got quite a lot of technology which is useful. It does give you the kind of things that allow you to see your progression. And I think that's quite important. Personally I just use, on my Garmin, I just use the heart rate monitor and the power part of it.

Because I'm only going a zone one. I just know I've worked out what kind of wattage I need to be generating and stay in that heart rate safe zone so I don't keel over and fall off the bike. But that gives me, if I'm going a long event like the Dallaglio foundation, we quite often do a hundred miles a day. So you don't want to go off too quickly because you know you've got a long day ahead of you. So it gives you a chance to sort of work out roughly what you should be going at. Of course it doesn't factor in when you're going up mountains, which is another challenge. I don't make sure I'm on my own. Because I don't want to talk to anyone, I can't speak and cycle up mountains.

SB: Yeah, I've always found the idea of cycling in groups quite challenging because I always feel I'm holding up traffic-

CL: It's quite dangerous as well.

SB: Or more likely holding up the person I'm chatting to as well.

CL: Especially when you get up mountains you want to go in your own zone, you don't want to be distracted. I've got a sound system on my bike, which just eases some of the pain.

SB: Yeah. Do you find yourself, I mean, you're perhaps a bit more expert in this than many of us. I mean, do you find yourself in the position of advising people against certain exercise sometimes? I mean if a geriatric like me

comes into your clinic, says, "Right. I'm training for an Iron Man." Do you find yourself saying, "Do you think you perhaps ought to stick a bit more to tiddlywinks?"

CL: Well I would encourage people of any age group to sort of push the boundaries and challenge themself. I think it's great. I have actually, I was treating Britain's oldest marathon runner for a while who looked very much like Sven Goran Eriksson. So the poor man kept getting pursued by people. But no, I think-

SB: How old is he?

CL: I think he was 78 or something. Yeah, the point is, I think you'd need to have an assessment by a physical therapist just to find out whether there's any major areas of concern. And I think if you prepared well, and I would never suggest anyone just puts trainers on and goes out running, I think you need to do some cross training and preparation. Because most of us are going to have some form of muscle deficiency or joint stiffness or something that needs to be worked on before you start running or cycling. So I think if you prepare well, if you've got a professional therapist telling you what sort of things to work on and you want to do at least a six to 12 week run up, most people don't want... That's too long. But actually realistically-

SB: Does it depend on your starting point?

CL: It does. Yeah. If you've not done anything since you were at school and this is your first return to exercise, then if you want to avoid being injured and very unhappy, then you do need to prepare. And I think you've got to get the right footwear. You need to do some form of core training so that at least you've got some fundamental inner strength. And make sure that...

SB: There is a theory though isn't there that actually training for the activity that you want to participate in is going to train the right muscles, and training the core on its own is simply doing exercise for exercise sake. Whereas let's say you're a runner, let's simplify and just be a runner. If you go out running, then the necessary elements of those muscles which constitute the core will strengthen.

CL: Not necessarily. Because when you talk about running for example, it's a sagittal event. You're running in one direction, so you're predominantly using muscles that operate in a sagittal plane. You're not doing anything in transversal frontal plane. And for example, if you are someone who's sedentary or weak, the chances are you're going to have weak gluteal muscles. You're going to have tight hip flexors, and if you've got weak gluteal muscle, particularly glute medius, once you get a critical point of fatiguing, you're going to start getting a Trendelenburg effect. You're going to get pelvic shift. Not only is that going to make your running less efficient, because

you're getting energy leakage, you're also setting yourself up for getting over use injuries.

So I think you want to eventually do targeted training for the event you're in. But I think in the preparation, it's like a pyramid. You want to get that basic foundation and then work up to sports specific stuff. And I think I told you earlier about that bodybuilder. Was a classic example of someone who was referred to me by a surgeon, Mr Great Britain. Recurrent back problems. Can bench press and squat massive amounts of weight. But when I was assessing him, he couldn't do the most basic simple core tests. Like for example, standing on one leg with his eyes shut. He was wobbling all over the place. If I did a glute test, muscles in isolation, he was actually really weak.

And when he went on a core program for, eventually it was about six months, not only did he stop getting recurrent back pain, he also actually ended up being stronger and better at his event. And as Joanne Elphinston said, "You can't fire a cannon from a canoe." So he, being a bodybuilder and power lifter, he thought I was mad telling him to do Pilates, but actually he now incorporates that as part of his program. He doesn't do it at the gym because he doesn't want anyone to know he's doing that. But he does accept that that's made a difference to his performance.

SB: He doesn't want anyone to know he's doing it because he doesn't want to give away a secret of his improvement or because he's a little embarrassed about doing Pilates?

CL: I think it's a culture thing. Bodybuilders are quite narcissistic and it's all about the look.

SB: Ripped t-shirts and mirrors.

CL: Yeah, exactly. And I think they think that's a sort of fairly feminine type of exercise, which of course it isn't. Just about every sport now is doing core work. Whether it's golf, I mean football has 11 plus system, which is 11 core exercises. So we're now, and there's lots of literature on this, we're now realizing that you've got to train in all planes of motion. You've got to activate all the muscles so it works like an orchestra. So all the instruments are playing in harmony and I take your point that you could just run but that's not going to deal with all the other issues that you may have accumulated along your way in your life. Particularly if you take running up later in life.

SB: Would you like to get up from the sofa and talk us through how you might assess an athlete of any level coming into your clinic? So we can see what your process is, how you might do a standard examination.

CL: Sure.

SB: Now, Clive, you've already introduced yourself to our model, our guest athlete this evening. This is Steve Adams. Steve, you're a fairly elite athletes aren't you? Can you tell us about what sort of sporting levels you've achieved?

SA: I'm not sure elite is quite right. I'm sort of an old age grouper and for the last eight, nine years I've been in the GB squads age group level.

CL: That sounds elite to me.

SB: And an Iron Man. Your greatest achievement there is fifth in the world or something in your age group?

SA: I was fifth in the Europeans this year at half ironman and I'm national champion at my age group.

CL: That's elite.

SB: Not elite at all really. Anyway, so that's establishing your credential Steve, is sort of the level of athlete that you are. So now we'll let Clive get on with his stuff and I'll hang on to this mic in case we need to...

CL: You were a sailor before that weren't you?

SA: I was, yeah.

CL: Yeah. So I would do a pretty standard physical therapy assessment. First of all I would do a mobility test and then we'll look at some muscle testing as well. So I'll take a look at his general posture. One thing to note stands out is this slight wing of the scapular and the rotation forward of this right shoulder. And I know talking to him earlier that he does get some impingement post swimming, particularly freestyle. A day or so after event you get some long head of the bicep and supraspinatus tendon obviously. And so that sort of stands out and he's got a little bit of a slightly bow legged there, but serves him well. Right. So what I would do to initially is assessment of the spine. So I'll get you to lean to your left side. And then down to the right, we're looking at the lumbar spine. And then I get you to lean backwards and straighten up and I get you to bring the left knee up towards your chest. Okay. And down. Now the right one.

Okay, great. And then I'll get you to put your arms out in front of you and then rotate round to the left. We're looking particularly at thoracic spine as a swimmer, we want to have good mobility through this thoracic area. And then round to the right and straighten up. Because you have coupled motion between the thoracic spine and the shoulder when you're swimming. If you let your arms down. And as the shoulders rotating through in the swimming stroke, the thoracic spine is going to rotate in the opposite direction. So if you have a lot of stiffness in the thoracic spine, you often see that in

recreational swimmers spending all week in the office, their shoulder sits forward and this is stiff, and that sets them up for impingement syndrome.

SB: Is that specifically for freestyle?

CL: It is particularly problematic in freestyle, yeah. And backstroke, you're going to have the same sort of thing. You don't do breaststroke in triathlon, but it's more of a freestyle problem.

Right, while you're standing, we just do an assessment of your muscle balance. So I'm going to get you to get this pole here. I'm going to get you to hold that above your shoulders at shoulders' width. And I just want you to do a few half squats for me and then we'll do some deeper squats. So what we're looking here is tells you a little bit about how tight the calf muscles are, how much dorsal flection is able to perform, and also the trunk's flexing forward. So there's, it looks as though there's going to be quite a lot of tension in the hip flexor muscles and maybe a little bit of glute weakness.

SB: Okay.

CL: I'll take that from you. And then we will-

SB: Am I right in thinking, and again, I'm not a specialist in athletes at all, but watching a guy who is actually supremely fit, I'm surprised at what looks to me like quite a loss of control in the internal rotation of the hips as he's squatting.

CL: Absolutely. We see this even in elite athletes and there are various reasons why this can happen. For example, you can have arthrogenic muscle inhibition if you've had back pain as Steve has had, and if you've had back pain, you're going to get inhibition of transversus abdominis and glute medius. So you're going to get these changes even in elite athletes. And recreational athletes see this a lot.

So I'm going to get you standing on your left leg now and then with your arms out in front of you, do a few half squats. Okay?

SB: That's not so successful, is it?

CL: Okay, well he has been on a watt bike earlier. Let's give him his... And then switch legs around. So this tells you a lot about the neuro proprioception and the ability to control. Obviously there's quite a lot of collapsing and Steve does do a lot of cross training and reformer work with Pilates, so that is, that's something that you're continually working on.

SB: When you say, what sort of bike did you say Steve had been on earlier?

CL: You were on a watt bike earlier, weren't you?

SA: Yeah.

CL: Yeah.

SB: What's one of those?

SA: It's a bike which predominantly measures your watt output, hence the name of the bike, but these days it measures a whole series of things in terms of the amount of load you put on each of the pedals, the rotation of the pedals.

SB: So this is a high tech piece of static bike.

CL: Yeah, quite a lot of Germans have watt bikes.

SA: Yeah, this one's specifically designed for triathletes.

CL: So if you turn and face me, we'll do a few little lunges. So with your arms above your head and then again going into this forward position, and what we're looking at is to see... If you do that once more on this one. Okay. Drop down. We're looking at how much deviation there is and... Come up again, that's good, and switch legs around. It just gives you... You should go into a sort of proper lunge. That's it. Go back to where you were and then kind of drop forward. That's it. Perfect. A bit more, that's it. So again, we're looking at the ability to control being in a neutral position. Ideally, the patella should be at between the first and second metatarsal. He's dropping a little bit on both sides, actually.

Okay. Is that, if you wanted to extend from that, you could do things like jump, star jumps. You could jump off a block. If you've got something like dart fish or some of the other video apps, you can use the patient or the recreational athlete's phone and then you can do video analysis. You can freeze frame it and slow it down. That's very useful because again-

SB: And then you were star jumps and you were jumping off a block. What are you looking for?

CL: Again looking for the ability to land in a neutral position and maintain control, where they're collapsing in, and it just gives you an idea of muscle function and potential areas of deficiency. So if we-

SB: Going back to this, you said that Steve's been on a bike earlier on, so he's tired. Is that not a good thing when you were assessing this because he's not as easily able to control any deficiencies? You're probably seeing a truer picture of what's going on in his-

CL: Well, if you've been complaining, for example, if he was running for more than 20 minutes, and started lateral actual knee pain, and I want to be more accurate in the diagnosis. Obviously, when I assessed him when he wasn't at

fatigue level, I'm not going to see or be able to identify what the tissue causing the symptoms is. So I think this is one of the problems when you put someone on a treadmill for a short period, you're not really seeing the true picture. So I would send you off and get you to do a run. In fact, we have in my gym in my clinic in Putney, we have a treadmill and we do get people to reproduce what triggers the symptoms. You've just been training, so this is not necessarily the most accurate way of assessing because you're probably a bit fatigued. So the answer is, I would test you when you're fresh and not fatigued at this stage.

Okay, so if I get you to come and sit on to the table, first of all, we're just going to test the hip flexors. I'm just going to get you to put your arms behind your back and I'm just going to get you to bring your left knee up towards your chest. I'm just looking at the ability to maintain your lordosis and you do drop slightly into a flex position. And then same on the other one. That's good, okay, and down. So that gives you some idea-

SB: So what would you see? Will you see flattening out?

CL: There is a slight flattening out, so there's probably a little bit of hip flexor tightness and some hip flexor weakness. In someone who had perfect control, their lordosis will be maintained equally. It's not actually bad because Steve is doing cross training. He is doing reformer Pilates. So he's probably addressing some of those things. And then we switch into a modified Thomas test. Actually, while you're in that position, I would also try and test the power individually as well, so if you could keep your arms folded, I'm just going to push down. Just gives me some idea whether you tilt laterally at all. That's good. Actually, that's good. So I can tell-

SB: Which way is he going to tilt and what would that indicate?

CL: Well, if I'm pushing down and he tilts that way, he's compensating for a lack of power. So if your ability to maintain the trunk is, if you're perfectly upright and there's good resistance, then there's good engagement, good recruitment. And then we move into a modified Thomas test. So I get you to come and sit around this way.

SB: Can I get you around this side of the table because you're blocking the lights over this way.

CL: Okay. So I'll get you to sit right on the end and then I'll put a pillow under your head. Lie back. I'll get you to bring the left knee up towards your chest. And we're just looking here for whether the knee sits below the asas on the pelvis. If it were up here, we'd know there was tightness in the hip flexor. If we bend the knee... Just bend the knee for me, bend that knee, and then drop down. So we see a bit of tension in the rectus femoris. So that helps us to differentiate. And then we switch around. So on this one, and on this one,

the hip flexor actually isn't too tight if you bend the knee. It's not as tight as the other side. There is a little bit of lateral shifts, so there's probably a little bit of tightness down the iliotibial band on this side.

Okay. And if I get you to come and hop up a second, I'll get you lying face down. And this is a fairly subjective test, but it does give you some idea of glute recruitments. So I'm testing the glute maximus and the hamstring. The bigger muscle should engage first, so we should see the gluteal muscle contract before the hamstrings. So I get you to lift this leg off, Steve. That's pretty good, and down. The problem with this is it is very subjective. You can get 10 people getting 10 different answers, and again. But just give you some idea. That's good, and down. And then same on this one. Okay, this is slightly down. He actually has been working quite hard on this, so in a lot of recreational athletes, you really see the hamstring tensing up quite considerably before the gluteal muscle.

SB: So how do you address that? Because lots of people talk about activation times for muscles, but how do you actually retrain the muscle?

CL: Well then you'd start doing some individual glute work. Now there's the hundreds of exercises out there ranging from cable systems where you're standing on one leg. It's better to do them with balance as well. And then you've got bands. You can do the crab walks.

SB: How does that address the firing pattern there? Because the glutes stronger, but does it also at the same time retrain them to fire earlier?

CL: Well then you'd try and do co-activation. So if you did bridges, for example, then you're working the hamstring and the gluteal muscles in unison. So you'd start incorporating co-active exercises. You're not just... You start off isolating it and then you build in more complex exercises.

Okay, and then while you're in this position, we can then do the glute maximus test. So I get you to lift the leg up and I'm going to push down and look for the resistance. Okay, that's good. We'll do the same on this side. Lift up. Good. Great. And then I'll get you lying on your side and we'll test now glute medius and minimus. Okay, so in this position we bend this knee up. We'll have that leg just about there. Okay, that's good. I'm testing the anterior fibers now of glute medius, so I'm going to get you to just push up against me. Okay, that's good. Again, it just gives you a rough idea. We don't know what happens when you reach fatigue, so if you want to be really accurate, you just do this over and over, lots of repetitions. And then forget posterior and go to here. And then same thing. Just push up and that is slightly. Okay, that's good.

SB: Slightly.

CL: It felt slightly, initially a little weak, but he quickly engaged us and that's fine. Right, and then I'll get you lying onto your back. And if you wanted again to do a little test to see how well he's activating his glute, but basically do a bridge movement. So lifting up, lift your bottom off the table and I'll try and get you to lift one leg up. Bend the knee up and hold it there and just try and hold that position. And what you're looking for here is the ability to maintain the table pose. I can tell he's been doing quite a lot of work on this. You've done quite a lot of training, haven't you on on this?

SA: Yeah.

CL: And then switch legs around.

SB: Are you finding that it's a little challenging doing this?

SA: Not this one.

CL: No, he's been doing this on machines. So he's, no he's not had any problems with that. That's good. Okay, and then down. Right, we could also test... Another way of testing glute medius is to, in this position with slightly off the table, I get you to try and push your feet apart. That's it. Good. Again, people who have got obvious weakness, they really struggle with that one. And again, Steve is pretty good at that. Right, because we also want to have a look at his scapular control.

Can I get you to stand up for a moment? And then get you to come and stand over the wall here. We're going to look at a fairly simple test to see how your subscapular and trapezius muscle, whether the lower and intermediate fibers are working properly. So if we start off with this, we're just going to do a one arm press up. So we do it with the left one first and I want you to sort of lean feet slightly further back. I want you to lean forwards and try and, that's it. Good. And come up again, and once more. Good. And then switch around. We're just looking for any obvious differences. That's good. Does one of those feel... Does one feel more difficult than the other or?

SA: No, not really.

CL: Not too bad. Okay, we can put it slightly further out. That's it. Do it again. The further out we have it, the more we're testing the pectoral muscle. You want to also move it in further to try to check the tricep. And then again. And you've had some little bit of issues with impingement on the shoulder so that scapular control is probably not quite as good as the other side. Okay. Can I get you lying onto your back for me? I'm just going through the, again, the mobility test. Having done a standing assessment, we'd now look at going through the whole joint kinetic chain, so I'd start off with a subtalar, checking the subtalar joint on each ankle, seeing if there's any joint restrictions and we go through all the individual articulations in both feet.

Then move up into the knee and a joint that often gets neglected is the upper proximal tib fib joint, which is quite an important joint for distributing load. So I would... If it was stiff, I'd try and work on some soft tissue and manual therapies to try and release that, test it on each side. Same on this one. That's often, this is actually quite tight. Does anyone work on that for you?

SA: Not recently, no.

CL: You've had work on that in the past, I suspect.

SA: Yeah, calf muscle.

CL: Yeah. Okay, and then we'd move into the knee joint, just do the Apley and McMurray tests. Check for any meniscal pain and then check patellofemoral. So it's a standard sort of physical therapy assessment which we're all aware of. And then we look at the hip, putting it in various positions of flection, internal rotation, and then the FABER test to see if there's any signs of femoro acetabular impingement or any hip pathology. Do the same on the other side. And then working up to the upper thoracic area. Can we get you to put your fingers together behind your neck if I take the pillow away? Actually, you're quite good. Most people who sat at desks, computers have their shoulders coming right forward because there's so much shortening in the pectoral muscles. That's good. So just to give you an idea of that. Pop that under there. Let your arms down. Then we do it again at the beginning just to shoulder assessment, checking for range of movement, internal rotation, external rotation. Do the standard sort of tests. And then it's the cervical spine.

SB: Do you use any of the textbook tests, empty can, full can, all that sort of stuff on the shoulders?

CL: Yeah, I didn't do it, but we do a Hawkins-Kennedy Test and so forth. And just looking for impingement. In recreational swimmers, supraspinatus and looking at the bicep are probably the two biggest causes of impingement and the oldest one is it can be arthritic changes in the chremicovicular joint and then calcification in the tendon. And often that, sometimes that obviously needs some decompression surgery, but hopefully you can improve things through manual therapy and often actually working on muscle balance. If you can release a lot of the tension in the pectoral muscles and then get someone working on subscapular control, very often you can change the position of the glenohumeral joint sufficiently to improve the subacromial space and actually avoid any intervention. I've seen that in a number of occasions. So again, because he swims freestyle, I'd just make sure there's a good range... Do you breathe both ways?

SA: Yeah.

CL: That's good. If you're able to breathe both ways, that certainly improves the biomechanics of your swimming style, because if you're always breathing to one side, that does develop muscle asymmetries and muscle imbalances. You're in good condition.

SB: So now you've done a full screening test of Steve here. Would you do that just on every athlete who comes in or is that you just demonstrating the range of things that you would go do?

CL: Because it doesn't take very long to go from, to do the whole thing, you can do the whole thing in probably 10 minutes, 15 minutes. So I would do that as a sort of standard assessment with joint assessment. And you get a functional test. There's plenty of literature on lots of... I didn't do many complex functional tests. You can add all sorts of things. If you know your anatomy, you can really sort of make up a lot of the stuff. You can add a whole variety of different things. It just gives you an overview of how everything's fitting together.

For example, I had a rower that kept having injections into lateral epicondylitis and a problem and no one's looking at the biomechanics of it, and I got her coach to send me a video of her towards the end of a race and we could see her shoulder was dropping forward in the last sort of couple hundred meters. And that whole scapular control was the reason she was getting this kind of kinetic chain effect. So she was on a program, cross training, and it's sort of the problem. Often you see this with typically with patellofemoral problems where you're getting tracking problems. If you're correcting the mechanics further away from the site generating pain, you can often improve the condition.

The problem is I think as physical therapists we are in a good position to do that. We can have a more holistic overview. Having worked with a lot of, or continuing to work with a lot of consultants, they're inevitably quite reductionist and they will use some sort of intervention to work on the problem locally. And it's quite interesting doing talks to surgeons and some of them really are quite surprised. They've never been taught that kind of connection of how things all interconnect. So I think we are in a good unique position as physical therapists to do that.

SB: We've had a few people ask you just to explain what you meant by arthrogenic back pain.

CL: Well, that's the work of Hodges and Richardson, Australian researchers who showed that when you had pain in the lumbar spine, how it interfered with the firing of transverse abdominis and then the oblique muscles and how that slowed down the firing. Because obviously, we know that if you're moving a limb that these muscles engage in the lower limb about 110 milliseconds

before we actually even make the movement. It's pre-programmed in our motor cortex. The same when move your shoulder, it's 70 milliseconds.

Now when you've had pain and you've had inflammation, that interferes with that neural drive, so that can be a delayed onset. And if you don't do something to address that, there are many people caught in a cycle of pain and reinjury because they have the problem treated. As soon as they start feeling better, they go back to normal life. They don't do anything to address that arthrogenic muscle problem and Hammerford talks about how that's a major problem because a lot of people are recurrently getting injured. So it happens in the shoulder. It happens in any joint actually, and vastus medialis in the knee is another example. If you've got a knee with a sign of itis, you will within 24 hours, even less, perhaps, you can get inhibition of vastus medialis and until that swelling goes down and that muscles re-educated, it won't function normally. So you'll then start getting patella drift, lateralization of the patella. So arthrogenic muscle inhibition is something that whenever you have any swelling in the joint, you're going to get a neuromuscular consequence.

SB: Steve, can I get you to sit up for a minute so you can answer a question, because we've had somebody ask, have you seen a difference in your performance since you've been doing Pilates?

SA: Yeah, significant actually. I'm 64 now and last season I set new personal bests both in swimming and cycling, and that was two years after I started doing Pilates. So the way that it actually stabilizes your core and the ability to be able to maintain a running stride when you're fatigued, your ability to maintain an aerodynamic position on the bike when you're fatigued, is greatly enhanced by the ability to stay steady within your core. And people think, okay, you're on bike. It's all about the power. You can drive to the pedals, but unless your pelvis is sitting stable on the bike, you can't do that.

CL: You lose that piston effect. If the pelvis is rocking and you haven't tried dumberg effect you start to lose power and you're also more likely to get injured.

SB: And a lot of our audience will have seen Karen, your Pilates instructor, on our program because she's been in and done some demonstrations of Pilates exercises for more general clinic problems. I think the nice thing about her is that she's pretty good at what she does, isn't she? And she's got all the equipment needed to help you with stabilizing your core.

SA: Yeah, I mean she's a force of nature on her own, actually. Anybody who's ever met her-

SB: And I'm not saying that all Pilates therapists couldn't help any patient, but you probably need to, if you're at an elite level, you probably need to find somebody who's got the-

SA: Yeah, she's exceptional and she's got all of the... We use a range of reformers and not just the basic one. We use reformers that you stand on as well and even when you're exercising parts of your body that you wouldn't necessarily think relate to a full reformer, by standing on them and then creating a movement in the reformer, you're actually improving your core balance as well as working on the particular item you're looking to strengthen.

CL: That's important because you're challenging the proprioceptor system as well. There's a lot of physical therapists, particularly the physiotherapists, are doing what's called clinical Pilates, which is taking the Pilates concepts and integrating the medical knowledge, and that's quite a powerful combination. And I have a physiotherapist working in my clinic who does clinical Pilates, just integrating the medical side with the rehabilitation concept.

SB: We pointed this out to our audience before where Karen's actually one of the main players in the local CPD group that takes place down at the spinal consultant's offices near here. It's great to have a multidisciplinary team like that. He's bringing in not just the osteopaths and the chiropractors, but also physios and Pilates service and hydrotherapists and others.

CL: Certainly when I qualified, I was never, we never spent much time learning about rehabilitation and I think that really is a game changer. I think that's what, everyone should have some form of rehabilitation. In my clinic, there's a three stage process. Get people out of pain, get them moving, and then getting them stronger again. I think that applies to what, whether it's a shoulder injury or knee. It doesn't matter. And that's often missing. And I think that's a contributing factor to people getting recurrent injuries.

SB: Shall we go and sit down again and talk some more about that. Steve, have you got your clothes in here or have you left them in the green room?

SA: I've got some here.

SB: Do you want to put your shirt back on and come and join us?

SA: Yeah.

SB: I'll take this over because Steve's not wearing a microphone, not surprisingly. So in that examination that you've just done there very quickly of Steve, are there things that have come out of that where you would say that he should be focusing his effort, or Karen should, or his osteopath sports therapists should be focusing effort?

CL: I think you can tell that he's obviously done, corrected, and he says himself-

SB: Come join us, Steve.

CL: He says himself that he's noticing an improvement in his performance. So I think they were quite subtle, and don't forget he has been training before he came on and so probably might be getting slightly skewed results as a consequence. But I think I would say you do probably, I don't think you can do enough glute work, put it that way. And I think it's good to experiment with different types of glute work because there's a lot of different variants, but the shoulder was the thing that probably stands out, is that slight... It's not a winged scapular as such because he can, actually during a wall press is not losing control.

SB: This a legacy of a fall you had from a break at some point a couple of years ago I think you said?

SA: Yeah.

CL: He didn't have any neuropraxia or any neurological damage, but it's been more of a functional thing. He's not had the full range of movement for a while, did you, initially?

SA: About three weeks after the crash, well, your guys were looking after me. I had barely any movement in the shoulder at all and the scapular had almost winged out to be perpendicular to my back.

CL: Yes. It takes an awful long time and it can take 12 months to really try and reprogram the, to get those stabilizing muscles of the rotator cuff and the subscapular muscles operating properly. I think in a lot of shoulder-

SB: Pilates has a lot to answer for and that just never... Because we've seen a lot less of you since you've been doing Pilates.

SA: It's just not good for your business.

SB: But in the studio, Karen's had you doing external rotation exercises and other sort of machinery.

SA: Yeah, exactly. Yeah.

CL: And quite often I see people not doing enough scapular controls or single cable retractions and low pull downs. You really got to try and get the lower trapezius and the serratus anterior muscles activated because they have major control over the scapula and that's your kind of platform the shoulder operates off, so a lot of shoulder problems, and I see this with surgeons, they've quite often operated on someone when they haven't been put on a rehabilitation program that might have got rid of the biomechanical problem, might've avoided them having injection therapy, for example. If you've got a lot of pathology and you have subacromial space is calcified and there are

obviously cases when you have to have surgery, but subacromial decompression is quite a fairly straightforward orthopedic procedure, but the recovery takes, in my experience, up to 12 months because it takes a long time to get that muscle balance back.

SB: I can't quote figures, but I'm fairly confident that the evidence doesn't suggest that it's hugely more effective than manual therapy in many cases, as well.

CL: That's right.

SB: Once you get the manual therapy right.

CL: Yes. There were a couple of studies. There was the shoulder and the knee was the similar sort of thing about meniscal pathology that when you looked at the long term studies, actually rehabilitation had as good as if not better outcome, so I think working on the biomechanics, certainly in terms of helping prevent injuries and that's, again, going back to what you said about screening people, but when they want to take up the sport, if you can spot things that could be a problem later on, you can prepare people so they are less likely to get injured.

SB: Right. Got some questions here. One of them is does Steve see an osteopath or a chiropractor? Well, you have seen osteopaths in the past. You've also seen sports therapists in the past, haven't you? And now, of course, Karen the specialist Pilates instructor. Have you seen chiropractors as well?

SA: No, no chiropractors. I've been see, well all of my physiotherapy, whether it be osteopaths or sports therapy has always been in your clinic. So your-

SB: I picked up your file before we went on air, actually, and the old file has been uploaded to our electronic notes and I was quite shocked to see, actually, I was the first person in the practitioner practice to see you, or at least the person writing the notes on you, anyway.

SA: You were.

SB: Some time ago.

SA: That was to sort out my lower back.

CL: Yeah, lower back problem. Yeah.

SB: Sam has asked, what were you palpating when Steve was flexing his hips while standing? Lumbosacral or sacroiliac?

CL: Both, actually. I didn't do it on air, but that's what I would be doing. You do it dynamically and then you do it passively. Both prone. I didn't do it. I usually do springing prone and then the other way around.

SB: And do you use any of the old established tests, Stork test, gossip test?

CL: Yeah, we didn't have time to-

SB: But you would use it. Most people would be aware of them anyway. And I don't, I'm not sure I follow this question, but Ian has said, "Clive, is there any evidence regarding muscle weakness in gold plated crowns?" Does that make sense to you?

CL: Talking about temporomandibular problems.

SB: Well, it's not further defined.

CL: Matt Wallden would probably have to answer that one.

SB: Okay, well he's on, he's on next week or next time.

CL: Because he did a talk about temporomandibular joint.

SB: Temporomandibular joint.

CL: Yeah, and how it affects the whole connected joint.

SB: If he wants to follow that up and be more specific with the question.

CL: There are people who specialize in, bite I know in football, and football is always prone to this. If someone comes up with something that no one else is doing that is new and could make a difference, they all rush to it, and I saw that at Liverpool. But there are people who specialize in TMJ problems.

And say that's the source of just about every biomechanical problem. I don't know if there's enough evidence on that.

SB: I'm growing more and more cynical as the years go by. And it seems to me that anyone who specializes in anything always says that that's the cause of all the other problems.

CL: I don't think we can be sure. I think there are things ... You have to be holistic. As I said earlier, you have to look at everything. As we know, with MRI scans, you can look at things that look terrible on MRI, but actually they're asymptomatic. So you're trying to decide what is pain generating and what isn't. But temperament of the job, maybe.

SB: Yeah. We've actually kind of asked then answered this question already, but Sacha's asked whether you actually have any pain or problems, she having now seen your spine and your mobility. I mean obviously your idea of a problem will be different from the average couch potato, but I mean are there areas that are particularly challenging in sport or everyday life as a result of all this?

SA: No. I mean in fact quite often when I come to see yourself or Claire, and I've got a problem, in normal everyday life, you wouldn't bother to go and speak to anybody but because you know that it's inhibiting your ability to train at the level you want to train at, you go and get it fixed.

SB: And is it the lower back that's more commonly the problem with now?

SA: Yeah, and also around the hip flexor areas and muscle release around there. I mean Claire's used acupuncture before on my left side to get those to release because it causes distortion in the pelvis.

CL: Yeah, you did say that most of your symptoms are post exercises. Steve's not getting pain when he runs, for example, in the lower back. It's the day after, isn't it? Or a couple of days later. You're feeling stiff the day after training. So probably a low grade sign of itis and the lower facet joints. And the same with your shoulder. You said that it can be sore after.

SB: Aren't you training every day?

SA: Yeah.

CL: Okay.

SA: And it's, as you say, sometimes twice a day.

CL: You mix it up there, don't you?

SA: Yeah, I mix it up. Never try to swim, bike, run in one day in order.

CL: How often are you doing pilates, actually? Out of interest.

SA: Coached, once a week. And then I do some of the exercises that Karen gives me post training event.

CL: Yeah. You do. Okay. How many times a week would you be doing that on your own then? Is that three times a week or ... ?

SA: Well I'll use her stretch regime after every session.

CL: The stretch. What about the core exercises? Are you doing those? Are you carrying on the stuff? I know you haven't got a reformer at home, but are you doing some basic core exercises in between the pilates reformer sessions?

SA: Not really, to be fair. Mainly need to do some squats and some activation around the glutes, but other than that, not really.

CL: Because that's one of the things, which is difficult. I mean everyone's time pressured but I try and get ... We use a video exercise format and I'll give someone no more than four exercises. If you give anyone more than that, they won't do them, and they certainly won't do them well. So in someone like Steve's case, I'd get you to do the core stuff maybe three times a week, even if it was just for 15 minutes. I know that's another pressure, but very often I have patients who say, "I can't understand, I've been going to pilates for a year now," and when you question them further they're often in a big class, they're not really optimizing it. And once a week isn't enough anyway. So I think if you're talking about building up type one endurance muscles, it's repetition.

SB: I think most people watching this will be thinking, "If only our patients were as compliant as Steve is." I mean you're a very focused guy. You want to be good at this stuff and you'll do what the-

CL: Well this is what's nice about treating sports people. They genuinely want to get better and they want to perform better and they don't want to be injured. So you know the bio-psycho-social part of that is quite enjoyable.

SB: Okay. I've got a great question. Well it's not a great question, it's just the way it's written, it amuses me. It's coming from Fiona Cockings Hamstring Injury Mason. But Fiona Cockings-Mason is an osteopath and wants to know about hamstring injuries. Apparently she started a triathlon last year and seems now to have a chronic hamstring retinopathy.

CL: Upper hamstring.

SB: What do you think could be the best way forward and is it treatable?

CL: It depends on the site of that. If it's an upper hamstring tendinopathy or whether it's sort of upper third. I mean quite often, I mean they are difficult, and the upper hamstring tendinopathy, like all tendon problems take a long time. If it's in the muscle belly, which it probably, it can't because it would've healed some time ago. I think if it's upper hamstring where it attaches on the ischial tuberosity, they are notoriously slow. I mean orthopedically they would probably inject it under ultrasound, which is controversial, because you certainly don't want to weaken the collagen fibers. But if you've got chronic inflammation then you're not going to get repair, so you probably got to do something, some kind of intervention to knock out the chronic inflammation.

From a biomechanical point of view, there could be a number of issues, it's hard to say. But very often weakness in the gluteal muscles is a driver for hamstring over activity. But then you've also got neural considerations. If you've got something, referred pain from the lumbar spine, whether that could be neurally driving the hamstring to be over active as well. But if its gone on for a long time, then I think you've got to ... I don't know whether she's got access to diagnostics, I don't know if she's had an ultrasound or an MRI scan.

SB: Do let us know, Fiona, because it'd be interesting to find out.

CL: Yeah.

SB: Yeah. And if so, what diagnostics should she be going for?

CL: If you've only had it tested clinically then it helps to actually see it and know how much tissue damage there is, and then you can make a decision based on that.

SB: Can you do that with ultrasound or would you prefer MRI?

CL: Ultrasound doesn't go quite deep enough. If it's an upper hamstring tendinopathy, you'd need an MRI scan. Obviously the disadvantage is you can't be moving it and seeing what the dynamics are. But unless, I may be wrong on this, but I don't think the ultrasound goes quite deep enough. Certainly the consultants I use, I've got a couple of pain consultants I use for persistent upper hamstring tendinopathy, they nearly always do MRIs out of choice.

SB: Okay. Tish Reid has sent in a question about competing. She says that she was an elite international athlete competing at world level in the 80's and 90's, with no option but to be a recreational athlete as they were all amateur, "Most of us holding down full time jobs." Biggest issues were coming down with flu or post-viral syndromes, et cetera. So actually it's an observation, not a question, but I remember hearing on an MSC sports therapy course. And actually the problem with athletes like yourself, Steve, you're right at the edge of the envelope and you don't need very much to tip you over into being ill because you don't have many reserves left. Whereas, in fact, couch potatoes like me, we've got plenty of reserves and can cope with bugs better.

CL: Well this is what I was saying to you earlier, Barbara at Oxford university who studies sleep, for example, says that in sort of 50, 60 years ago, we were averaging between 8.5 and nine hours a night's sleep. Well the average now is somewhere between six to seven hours.

SB: What do you reckon you get?

SA: Nine and a half.

SB: Nine and a half?

CL: Nine and half? Excellent. So in order to get repair you need adequate amount of sleep to go into a non-REM, non-rapid eye movement sleep, which then will activate growth hormone, which will then help mobilize any tissue repair. And it also reduces cortisol levels. So again, this is particularly problematic in a triathlon, where you're trying to compress three sports. A lot of the athletes I see have got stressful jobs. They're running on sympathetic nervous system and high levels of cortisol, and that's a massive contributor to them getting injured.

You've got to be really disciplined, I think, and try and make sure you're getting adequate rest and sleep, and that is a challenge. I feel for her because that is probably the biggest problem. I think as manual therapists we need to be reinforcing that side of it because if our athletes we're treating, whether they're elite or recreational, are failing on that front, they're going to get injuries. So you're not getting that repair process and that's really important. And that kind of ties in with the nutritional approach as well, which is not my area of expertise. But ...

SB: No. But you obviously take an interest in it because you're dealing with ... What do you do about advice on nutrition for most athletes? Do you simply refer them to a nutritionist?

CL: We did have a nutritional therapist in our clinic. Ironically, she didn't get busy enough and has moved on, but we still refer people to her. People are reluctant to go to a nutritional therapist because they say they can get enough information off the internet. And the trouble is the internet, as we know, it's a blessing and a curse, and there's a lot of misinformation there. I think nutrition is a key part of it and there's obviously a lot of controversy about supplementation and so forth, but I think that's a very important part.

And equally, I don't know what you do about fueling up when you're riding, but do you have just water or do you have electrolyte drinks or what do you do with that on that front?

SA: I have a nutritionist.

CL: Oh, excellent.

SA: And I think, in addition to pilates, that was one of the key things that helped me get a lot better.

CL: I'm sure.

SA: Yeah. Because the physical training, you'd experimented with most things. The other thing to say is that if the nutrition program is right, it tends to make you sleep better because your digestion system is working properly.

CL: Eating at the right time as well, isn't it?

SA: And how many times you eat, and what you eat. And we have a conversation every week where we discuss everything that's going through, how that's linking with the training.

CL: So you're well-prepared then.

SA: At this stage I'm taking as little in the way of supplements when I'm training as possible, because part of the winter training is to not use a carbohydrate burn to train on, but to use fat burn to train on, so that when you come into the race season, you start introducing the carbohydrates, they burn much faster, much more efficiently, and you get a big lift in your performance.

SB: Really?

CL: Yeah. And your premium fuel is the carbohydrates and fats aren't they? Not proteins.

SB: I'd be concerned, I'm sure many people are, about finding an adequately qualified nutritionist to refer people to you. Because I've got the sense over many years now, that nutritionists are on a very wide spectrum with the sort of Gillian McKeith at one end, and then some really expert people at the other. So how did you find yours? How do you determine what's a good one, what's not?

CL: Well, that is a problem because it's not a regulated profession. It's a bit like psychotherapy has the same issues, there's many different standards of training. One of my patients is Patrick Holford who has written many books. So I was lucky to be able to have someone referred by him. But no, we would vet, we'd look into someone's CV and we'd hopefully get someone who is adequately trained, because there is a problem. So I think until it's regulated it is a bit of a lottery.

SB: Yeah. How did you find yours? Is this by chance or was it by recommendation or ... ?

SA: I found it really difficult to find one, to be honest. I mean the first person I approached was a referral from your clinic, and most of the nutritionists I was trying to find were just too busy.

SB: Really?

SA: And I just got really, really lucky with this guy. He works in sports science.

SB: I was going to ask if he was a specialist in athletic nutrition.

CL: Yeah. The person we were using was involved in research and did talks to university and had a ... So I think if you can find someone from that background, that's going to be a lot better. It's the same problem with personal trainers. They also are very variable. They can have a sports science degree or they can do a very short course. It's the same issue, really.

SB: Yeah. We've been asked by a couple of people, I believe, for information about kinematic chains. Now I think I saw something about that sort of thing in your presentation, didn't I? Fascial trains and ...

CL: Yes, I mean ... I think it was on one of my presentations, it's really about optimal joint function. It's based on the kind of work of Punjabi, which is about ... Going back to Grokovetski, sorry, who talked about the gravitational pulse, about how we harness our gravitational field, and how we can maximize the efficiency of that if our muscles are all working in a proper sequence, if our joints are operating in a neutral zone. So we're dispersing forces through the joints in a neutral sort of position.

So yeah, the kinematic chain, really, is just how everything interconnects. So a perfect athlete would be someone that has an efficient muscle sequencing, so no energy is lost, no torque. And joint movement would be pretty much biomechanically perfect. Obviously that doesn't exist, but that would be the kind of computer model. And it's about the summation of forces. For example, if you're a tennis player, it's your gravitational forces coming with your interaction with the gravitational field, and the force is coming through the body. And as your mass decreases, the velocity of your limbs increases. So this is why the core area is so important. It's that, leaving from the Grokovetski thing about the spinal engine as being the engine room of motion. And it's about having that flow of movement and kinetic energy.

SB: Here's a question which appeals to me. It's one about stretching. What do you advise on that, in that regard, in terms of ballistic stretching, static stretching, pre-, post-exercise? And the follow up to that is what do you actually do?

CL: Yeah. I mean stretching came in for a sort of negative review following that Australian rugby league study, which basically showed that it didn't reduce injury. I think anecdotally we know that if muscles are operating in a shortened range, they're going to be less efficient, and certainly I do recommend stretching. I do recommend ballistic type stretching. I made the terrible mistake with Montgomerie once when I first went on tour with him.

SB: Is it Colin Montgomerie, the golfer?

CL: Yeah. I did a sort of stretching which was not ballistic. It didn't recruit the global muscles and help generate viscoelastic properties. I did the reverse. I managed to relax all his muscles, and he went out and the first tee he was

like one of these floppy dogs, so that was a bit of a mistake. But my view is that you should stretch ballistically before, and I do encourage people to stretch afterwards. I know the literature is very mixed on whether that is a good or a bad thing.

SB: There's a psychological component in it though, isn't there? Most sportsman and athletes believe in stretching, and therefore if they don't do it they probably won't perform to their best.

CL: Yes. So I think that's very true. And certainly, I mean what was it, to Olympics? If they see someone doing something they're not, they're going to do it because it was the same with K tape. Everyone was covered in K tape at the London Olympics because if they saw someone have it, they've got to have it. And the same with Rio, was with cupping. Everyone was covered in bruises because they all wanted to have cuppings. So my feeling is that stretching is important and I do think the ballistic type stretching is ... There's obviously lots of different types.

SB: But again, after warmup, not straight away.

CL: Yes. Yeah. I do a lot of muscle energy work on patients, because I do a lot of soft tissue work, as well as doing mobilization and manipulation. I use a lot, actually, in soft tissue techniques.

SB: And so your stretching routine, do you have one?

SA: I do. I don't do much pre-stretching. I concentrate on warming up properly to make sure that when I do start to attack the session, that the muscles are ready for it. But I wholeheartedly believe in the need to stretch post exercise, for no other reason that ... It might have something to do with my age, but were I to get up the following morning and try and train, the muscles that I hadn't stretched out from a previous session, it would be really difficult to do.

CL: Same for me.

SB: Right, yeah.

SA: And I'm not sure that is necessarily an age thing, but just putting the muscles back to where they were before you started the session just seems sensible to me.

CL: Yeah. I think the warmup bit is very important. I think sitting there doing passive stretching if you're going to go for a run is not the right thing. Like you said, a warm up, running on the spot, and doing more ballistic stuff. And then the more passive, gentle, slower stretching afterwards.

SB: Okay. And what about your favorite problem in recreational or other athletes, which is plantar fasciitis?

CL: I've had plantar fasciitis. Ironically, I've been to a sports conference and plantar fasciitis was one of the topics. I'd been sitting all day, when I got home, I went for a run and I managed to tear my plantar fascia. So I experienced it. I mean the research literature says, the American Orthopedic Journal of Podiatry, which I was looking at recently, said that no matter what type of treatment modality you adhere to, it's nearly over six and nine months for recovery.

I mean, personally, when I get people with plantar fasciitis, the first thing I do is try and reduce the pain. So I would do things like give them very gentle ... As long as you're sure its not been ruptured, you give them gentle stretches.

SB: Using what? Golf ball or what should you put your foot on?

CL: Well I get them to put it up against the wall and do the knee flection towards the wall to stretch out the plantar fascia. It's a good stretch. I'd also do, following on from the kind of fascial concept, I would get them stretching further out. So I get them doing like a calf stretch and hamstring stretch on the stairs with both legs. And I think going into that sort of flection position, you stretch the whole posterior chain, which I found, when I had that, works very well.

SB: Steve's nodding. Is this something you've suffered as well?

SA: No, but I recognize the stretching regime.

CL: Yeah, but I also, to again, get rid of the pain, I think two things that really do make a difference is ice rolling, So rolling the foot on ice. You could take nonsteroidals although the evidence is not that great that it helps. But I think one of the things that I found really helped was strapping. And you can buy now, plantar fasciitis straps, actually, you can get. You just unwrap it and wrap it round. I mean effectively-

SB: Sounds like a little bit of low dye taping.

CL: Yeah, you go from the heel to the metatarsals, and then you wrap around as well, so you hold the whole thing up. So that gets you out of trouble, I think. Then longterm you want to look and try and understand why its happened. So you might want to see a podiatrist or get one of the physical therapists to look at your biomechanics and your feet, and look at your-

SB: Are you a fan of orthotics?

CL: I've got them actually. I'm lucky to have a podiatrist who doesn't sell them to everyone that comes through the door. I'm a bit cynical when every person

who goes to a podiatrist comes out with a set of orthotics. So I think they do help if they're used correctly.

And then I'd also get someone working on rehabilitation. So I think an example of that would be a bit like Achilles tendinopathy, doing a lot of soleus and calf work. I mean the research evidence is that it does really help the ... Certainly the tender Achilles, and I think it also helps the plantar fascia as well, if you can get that soleus, gastro into strength.

SB: I was talking on a series the other day. I've always thought that part of the problem with the plantar fascia is that with any injury you kind of want to rest the tissues while you're rehabbing them. And it's to rest the plantar fascia.

CL: It is.

SB: And if you can stretch the calf muscles, that's going to help. But I think isn't that the theory behind a lot of insoles or even proper orthotics, is that you can actually take the strain off it.

CL: Yes, it can. But I think, if you were a triathlete for example, and you have plantar fasciitis, and this is important psychologically, you wouldn't say rest completely, what you'd say is, "Steve, this is a really good opportunity. Rest your foot, get to the pool more, work on your core stability, do more cycling, offload the plantar fascia," so you don't lose momentum. Because there's nothing worse than being told not ...

I had a girl recently who's got a labral tear, which you know, very often they're asymptomatic. And she was told not to do any more sport, not to do any running, it was an NHS patient. And we've got her back running. And psychologically, she's in a different place. She'd been really depressed to be told, catastrophizing it. So I think you modify the training, and if you're a triathlete and you got an injury, if it's your shoulder, you keep training, you don't stop training.

SA: Yep.

SB: Got a question from June here, about diet. And it says, "Do I train on any carbs or just good fats ... " Actually I think it's saying to you, not me, because I eat any old bloody thing, I do. "Do you train on any carbs or just good fats in the quiet season?"

SA: Good fats, always.

SB: What's that mean?

CL: Not lard.

SA: Not lard. Not saturated. And I mean the type of good fats that you want to be taking in are the sort of things you get from nuts, and not the sort of fat you get from meat. So eat very lean meat, take your fats through nuts. Getting the fat level right, in balance with everything else you're doing with the carbs and the proteins, is really important.

CL: You have olive oil? Things like that as well?

SA: I cook with olive oil but I don't actually eat it.

CL: Yeah, and I think you're right about the vegetable fats, particularly.

SB: Steve Bass coming in with an observation here about a Fiona Cocking-Mason's question about the hamstring problem. He said he's had good results using carefully prescribed dead lifts in the same situation. "It takes time to build up safely, but the results make the effort worthwhile."

CL: Yeah, that's sort of eccentric training, which is a recognized way of helping muscle rehabilitation. I think you want to make sure you understand the pathology first before you do eccentric training, because obviously if you're lengthening the muscle under load and if there is an undiagnosed partial tear or something like that, you run the risk of-

SB: Dead lifts is one of those exercises as well, which you can easily get wrong if you don't do it right.

CL: The technique is critical, yeah.

SB: Getting the weight right, and not trying to overdo it.

CL: Yeah, you really want to start with getting the technique absolutely right. And I go to a local PureGym with my wife and kids, and I have to close my eyes sometimes, I just can't believe what's going on. So yeah, the technique is really important.

SB: Young people, they can cope.

CL: But Nordic hamstring curls, where you're fixing your feet under the object and then letting the trunk foot go forward, is another eccentric training, which the research evidence shows is as a really powerful way of helping to rehabilitate hamstrings, particularly.

SB: This is actually a very good question because there may be people, lots of people who don't know what it is. Elspeth has asked, "What is ballistic stretching?"

CL: Well that would be a bit like you were doing before, during lunge type stretching, and dynamic training.

SB: As opposed to sticking your heel on a table and just leaning forwards, which is a static stretch. It's actually movement incorporated-

CL: Well you could turn that into slightly ballistic if you put your foot up and you're flexing the trunk. You want to be careful not to get injured. But no, ballistic is, as the name suggests, there's a bit of velocity in there.

SB: And as I understand it, the evidence is much more in favor of ballistic stretching, movement while stretching, such as the bouncing you were talking about there, as opposed to static, but you do have to be careful. I don't know, you probably remember this, but for years, certainly in sport, we were all told don't bounce when you're stretching your hamstrings. But of course that's because people do uncontrolled broucing and drop their whole trunk weight into the hamstrings, and they're likely to cause tears. Actually, if they do it properly, they'll get better stretches as a result.

CL: And tendon injuries require load to ...

SB: Someone's asked about the book that was mentioned earlier. "Can you let us know the name of the author?" Sorry, they're not sure what book it was. Well I think it was Jo Elphinston probably.

CL: Which I never ... Its got quite a long title.

SB: Yeah. So, all right, we'll put that up on the website.

CL: Yeah. It's a great book. And I've heard her speak and she's-

SB: And she was a great guest as well.

CL: Yes, yes. I saw some of the videos. She's very good.

SB: Robin's got one about returning to training. "Clive, do you have any advice regarding the classic problem with getting athletes to rest during recovery and then graded return to training, especially where weights are part of the training protocol? He tends to get his to do pilates in yoga and low weight, slow form work on the weights, but struggles to restrain some of them from overloading too early."

CL: Yeah, I mean that's always ... You've got to be pretty firm, I think. And that's patient management. Yeah. I mean you've got people who don't want to do the exercises and then you've got some who are just a bit overzealous. So I think you've just got to explain that if you don't follow what I'm saying, you're going to end up remaining injured.

But if you're doing a mixture, and depending on the injury of course, but I think going back to exercise as early as you can is definitely what is the recommended in the literature, pretty much whatever injury you've got, just

the right time. I think pool work is good as well, going into a pool environment is very good.

SB: Which is great if you're dealing with a triathlete who likes swimming, but how do you feel about it when a therapist says to you you've got to back off from the exercise? Do you accept that advice readily and think, "Well, it's going to help in the longterm." Have you ever been in that situation?

SA: No, I've been in that situation and fairly recently. I think because the therapists that I've been working with, I've been working with over the last seven or eight years, I trust them. I'm paying for their expertise and if they tell me to do something, I'll do it, because ultimately I just want to get back into training at full fitness as quickly as possible.

SB: Yeah. When's your next event?

SA: I've got a few running races and stuff like that, which just kind of helps you keep on track with the endurance side of things, particularly in the winter. But my target races are not until the summer. My goal this year is to make sure that I got qualified for Bermuda next year.

SB: Which is what? Ironman?

SA: Oh no. I'm dropping down the distances a bit to ordinary standard distance, and going back to doing the ITU World Championships.

CL: I think it's better. I think half an Ironman is a safer bet, really. And I told you earlier about the ultra one. I mean you already are pushing the bell curve to the right if you're ...

SA: I think with ... I mean I've done Ironman, and I've kind of retired from Ironman, but I'm much more interested in racing now.

CL: Yeah.

SA: And the Deca triathlons and the NG Man, and all of those things, they are what they say on the tin, they are exercises in endurance. And actually I enjoy racing much more. And I think the distance that you can race effectively to without killing yourself is the 70.3. I think it's the loveliest of all of the triathlon disciplines, because it's long enough to know that you've been in an endurance event, but you can race it right from the start to finish.

SB: Okay.

CL: Yeah, absolutely. What's great as well, in the older age group you get to be able to keep fit and keep active. And if you can't run you can do duathlons of just cycling and swimming. I mean all the literature about the benefits of exercise, overwhelming aren't they?

SB: Well Steve, thank you so much for coming in. Best of luck for the races, and for Bermuda, and for everything else.

SA: Good to meet you.

SB: And Clive, many, many thanks for you coming in as well, sharing your wisdom.

CL: Thank you, honestly.

SB: If we do get any late comers questions and perhaps you'll let me send them on and we can feed the answers back to the audience.

CL: And if you want any of the slides, we didn't really get a chance to look at them.

SB: No. But if you're happy for us to put them up on the recording website ...

CL: Yeah, sure.

SB: Then we'll put them up there and people can work their way through those, and maybe that will prompt even more questions as a result.

CL: Or if anyone has any ideas help me as well, that will be good.