

340- Neurological Testing with Jake Cooke

Steven Bruce 21:53

Well, good evening, I'm here we are, again with the penultimate show of the year. Next Wednesday, lunchtime is the final one. That'll be a case based discussion. But this evening, however, we are looking at neurological testing, and I'm joined by chiropractor Jake cook. Now Jake has specialised in neurology and neuroscience since 2012. In fact, he finished a master's degree in neuroscience and a couple of years ago. And I asked him to come in because well, first of all, lots of people have asked us to look at neuro testing. But also because I suspect that deep down many of us want to be sure that we're getting it right. You know, that we're testing efficiently, and we're interpreting the results correctly. So Jake, welcome. I'm hopefully you're gonna be able to help us all out with that sort of thing. I think very much having your fresh from huge success at the BCA conference. You told me a couple of weeks ago, did that go down?

Jake Cooke 22:39

Well, yeah, I mean, I had access. But yeah, it went down very well. We're talking about wider headaches and migraines progressed from being episodic to chronic. So why would someone go from having, say, to tension headache headaches a month to 15 headaches or migraines a month, right? So a huge thing we're seeing in clinic, right? So if we can, if we can meet someone and, and really quantify how many headaches you're having, you can predict where they're likely to progress and have more headaches, or migraines, or whether we have a window where we can help them regress the other way,

Steven Bruce 23:06

it sounds like we could do another show on that. We've done we've done some work on headaches before. And there was a great study called the headache study, which I think came out of Edinburgh University. But there are a lot of osteoporosis involved in that. And yes, we nicely around the headache route at some point. But that's probably not for tonight to lose. This is a neuro testing. Yeah,

Jake Cooke 23:27

or the interesting thing with it is that they have such these, these overlaps between pain in the body and pain in the head, so that the pain systems are not separate. So we know the anatomy might be at the point of insertion separate, but when it gets up into the cortex, you get these blending. So if someone has more points of pain in their body, or multiple points of pain in their body, they're far more likely to develop chronic headaches. So when you say chronic, I'm gonna say whenever I say chronic today, we want to try and get away from thinking chronic as time we want to think chronic in terms of pathophysiology. So you could develop chronic low back pain in a week. So it doesn't have to be I've had it three months. If you have a severe onset of pain, then those main processes happen very, very quickly. How are you

Steven Bruce 24:10

getting on with convincing the NHS to use that terminal not well.

Jake Cooke 24:16

But it's so there's kind of two things that really affect the onset of chronic pain, or the pathophysiology of chronic pain, and one is the severity of onset. So whiplash, for example, we know that people have whiplash, 50% of them go on to develop chronic neck pain. It's a big statistic, isn't it, you know, you have a little fender bender, and you think it's not a big deal, and one or two years later, you're still experiencing neck pain. So these these, this pathophysiology happens really, really quickly. And as as manual therapists, there's a short window where if we can get involved, we can try and divert them from going down that long term pain pathway. Or if we miss it, or or we treat them incorrectly, we can push them down. So it's trying to try and to get your assessment to be as accurate possible.

Steven Bruce 25:00

And finally, the whole question of whiplash is so fraught with difficulty, isn't it? Because neither you chiropractors nor we osteopaths are allowed to say in our marketing that we can treat whiplash. But of course, we know we can, just as physiotherapist cameras, well, we're not allowed to say that we can. But also we had a show not many weeks ago now by a concussion experts. And she was saying how you don't have to have a particularly hard impact in a car to generate not just whiplash, but also concussion symptoms, which can often go unrecognised, because it's not like a rugby impact where somebody stamped on your head or whatever, you know, it's just that movement that does it. Yeah, absolutely. What are we going to run this evening.

Jake Cooke 25:40

So I thought, first, we could talk about that. Take some of the fear out of the science behind it. So we'll talk about how that chronic pain can develop, how you can assess for it, and then how you can track whether you're actually making a difference. So we don't want to be in a position where we're just seeing patients for years and years and years. And I'm sure we've all got to meet those patients, but we don't want someone who's been coming in for years. And their back pain is still just as it was. And they kind of feel you're just holding them together, we really want to have this plan in place. And we know we're moving them back towards a pain for your healthy lifestyle. So if we were to look at the slide over here, when we're looking at pain, we've got a nice picture of of someone putting their finger on a pin. If we were to change that, and we were to make it a little bit more dramatic, rather than a little little pin, let's imagine that you took my finger and you briefly tore it off. So it's a really painful experience, we're going to get a huge barrage of pain signals coming from the finger through those pain centres, up through the nerve into the dorsal horn and spinal cord. Now, don't worry, it's not going to be a big anatomy lecture. That's about as complicated as it gets.

But the first thing that's going to happen is we get this huge barrage of pain signals of electricity, it's going to come into the second into the first or second first order of the First Order neurons, it's going to try and tag the second one, you're on us to go and get that signal to come up to the brain to say ouch. So normally, these pain signals are being activated all the time. So if you were to squeeze your own finger, that is painful, right? So if I squeeze my thumb that's generating pain, but hopefully, I should have to squeeze my finger pretty hard before it says, ouch. Yeah, now I gave you my thumb to you. And I said squeeze it. Because there's a little less trust there. I'm gonna say, yeah, so we call that pain pressure threshold. So how much pressure can you take before it's painful. So when you do it yourself, there should be a very high pain pressure threshold, because your brain trust, you're not gonna hurt yourself. During the summer, we went on holiday. And there was this South France, beautiful place and they had a pizza oven. So it's the whole authentic thing, you have to chop wood and do all that it's really fun takes like an hour to be able to prepare an app and just it's a complete waste of time, waste of words, not ever worth it. And it was very fashionable during COVID. But it's just not worth it. I got this monster a splinter in my thumb, I got to the point where I was drawing blood. And I would genuinely say it wasn't painful. Without trying to be tough, I would say it wasn't hurting, it was bleeding. My mother in law was amazing responses, the moment I gave her control suddenly was agony. That is that pain press threshold that that descending inhibition coming from our brain. So when we look at the brain here, what should normally happening is we have a huge amount of descending pain inhibition coming down to say, don't worry about it doesn't matter. Even just standing on your two feet activates pain. So your brain has had to evolve to be in a state where it can constantly say don't worry about it. I know I know scenario, that's not painful. Normally, we have 10 times more pain inhibition at the level of spinal cord, then we have pain excitation. So I put my finger on a little pin, actually, it takes quite a lot of pain for my brain to say thank you, I recognise this as an abnormal sensation versus just standing my feet. So if we went back to my slightly brutal analogy and tore my finger off, we get so much pain coming in. But the pain inhibition is no longer going to be sufficient. If the signal is very, very strong members electricity, so electricity is going to come in, it's going to cause changes in that second one neuron. And basically that second one neuron is going to become more pain efficient. So it's gonna put up more receptors. So imagine if this is a nerve, and normally we had like one pain receptor and said that second one neuron is going to grow five or 10 or however many over what period it didn't happen within hours. Right. So there's been some interesting studies with rats, which is maybe sad for the rats but beneficial for us. Were the whiplash a rat. They have two rats, they whiplash both of them in one rat, they don't do anything. They just wait for hours before going in and putting lidocaine painkiller into the cassette, and the other day do it immediately. In the route that immediately has the painkiller, it doesn't grow, develop any chronic pain at all. The route that doesn't have it for just four hours. He's on to develop all the hallmarks. So the way you assess that, and erratic, again, is putting pressure thresholds. So that rat won't put pressure on its poor anymore. So one of the interesting things is we you know, all this anatomy, you know, like sci fi down with MC six, MC seven RT rats are the same as us. If I injure the C five, for set preset, I'm going to get hyperalgesia or more and more pain sensitivity in the L in the C five demo. So that's something we'll go through later is how do you assess for this, so what we see in rats is they'll no longer put pressure on that, that dermatome even though the injury was in the neck, making sense so far. So when we have this barrage of pain, we lose pain inhibition, and we gain pain, excitation. So instead of having 10 times more pain inhibition, literally, we lose. You know, in the brain, every every one neuron is connected to about 10,000. Others was the same as in the in the spinal cord, you have one group of neurons and all their buddies kind of saying, Do it, do it or no, don't do it. Don't do it. So when you have pain, what happens? Is those those guys saying don't do it kind of drop out. And the guy saying do it grow, enhancing research? So they reverse the number, but that they become much more like? Yeah, so

now the pain is so severe, that just touching it is painful. So we've all had the patients where you palpate them really gently and they're going, Ah, it's really sore, then you're like, yeah, come on, just touched a little bit, or you do the best adjustment you've ever done in your life. And they walk out the room still rubbing it. So it's really showing like how that was perfect. I couldn't have done it any better. What happens is those pain signals become so strong, it doesn't matter what you do, it hurts. You may have seen patients where you can't touch them, you know, they've got such generalised body pain now that doing the lightest of palpation. How it hurts? Yeah. So it's tempting to write them off as just kind of a bit pathetic. But actually, there's some strong physiology. They're

Steven Bruce 31:58

good. Well, we'll hear later, I hope how you deal with those patients. Just before we go any further here, you talked about your mother in law, pulling out a splinter that be more painful, is that the same mechanism but in a shorter timescale than the central sensitization which we talk about in maintaining chronic pain?

Jake Cooke 32:16

Really good question. So we have peripheral sensitization that always occurs in any injury. And we have to have that. So imagine if I tore my supers notice, I want more pain there so that I don't let you poke it, I don't move it around and keep irritating it. So Prime peripheral sensitization, the other term that we've used in conjunction with the primary hyperalgesia, so the primary site of injury becomes more pain sensitive, you're gonna see that in any pain site. Primary hyperalgesia doesn't mean that that chronic pain process is present, it just means that you've got local inflammation, that the nervous then sparking, and it's enough to get your brain to pay attention to it basically. If the pain is very severe, once onset, Splinter isn't enough, but finger on fire is. Whiplash is you know, the sudden, sudden savage destruction of the neck, we sprain these rich, the innovative for set joints, that process can occur very quickly. So we know that in the rats, less than four hours is the thing that we're not rats, they got a high metabolism. But for ethical reasons you can't do on humans, right, I can't whiplash you and then you have whiplash your twin and see, see what happens if I inject it. But that pairing process probably does occur in in days. Now, the other thing that happens is, let's say that's been to six around for a while and it gets infected and it just doesn't heal up properly. If I have a slow kind of drip feed of pain, that can develop chronic pain too. So it makes sense in terms of when we talked about chronic pain being three months, that's fine when we're talking about those things where my low back started hurting. And I didn't see my osteopath. It was misdiagnosed and six months later is still hurting, that can develop slowly as chronic pain. But if I, if I destroy my back to and lift my arguing three rolled out of Bath, he doesn't want to get out of that it can develop into chronic pain really quickly. And then there's a whole bunch of sensitivities and factors that that affect that. Right. So one of the big ones obviously be depression. So if you're a depressed person, Farmer later that chronic pain because we lose that descending inhibition, yes. Anxiety, same thing. If you live in an anxious world, your brain is kind of looking for problems, you have a lack of inhibition, you have more excitation, your brain wants to know about the

Steven Bruce 34:30

same mechanism. The mother in law, is the brain saying or it's something else to worry about now, which is that she might hurt. Exactly. I've got no control over exactly so and she's my mother in law she's likely to there's

Jake Cooke 34:39

a trust issue there. Yeah, yeah, she can resolve five years of seconds.

Steven Bruce 34:46

Okay.

Jake Cooke 34:48

So yeah, there's a whole load of factors that involve involved with it, including developmental stuff. So we know that if you were to have history of physical abuse or neglect or sexual abuse in your childhood or teenage years, that's a risk factor for chronic pain. So, in those scenarios, it's literally an independent risk factor server. And sadly, a lot of studies are showing that a scary number of women have experienced some kind of physical sexual or neglect in their childhood or

Steven Bruce 35:16

even a number of shows on the on this topic. It is, it's quite alarming that the fact that that certainly in my training, we were never told even to think about asking questions along those lines. That's, that's a psychologist or counsellors job not ours. Yeah, absolutely. But it matters, doesn't it, it really

Jake Cooke 35:33

matters. It's an independent risk factor for it. And so we can meet someone who maybe is quite sensitive, and just think you're annoying, you know, so sensitive, there's a statistically there's a good chance that something happened in the past. And that basically Prime's them for that, that pain to literally see, we've got these little supporting cells because astrocytes, they literally become primed. They're like, ready to pump out information and your immune system is ready to pump out information at the first time, the threat. That pain system can become so savage that we have spontaneous discharge pain, so you could have patients sitting on your desk, or not sitting on your desk, that'd be weird patients sort of sitting on your bench. And they could just say out, you know, you could have palpate the neck and five minutes later that oh, God, I can really feel that. It's because that that synaptic cleft from the first organoids a second on your is so sensitive now that if there's any new adjustment that just happens to be floating around in, it just bumps up against second one you're bound, it hurts. Whereas normally you just have this barrage, right, you just have loads and loads and loads of it. So you can have spontaneous pain where patient gets written off by their GP or something as just anxiety or more attention seeking, because they're saying it hurts when doesn't hurt when it shouldn't have. Yeah, so we have that real allodynia that

Steven Bruce 36:48

Daniel uses asked the question. He's asked whether we understood correctly? Are you saying that medication in the early stages after injury will negate the chance of ongoing chronic pain? And can you say the same for the early post injury intervention with osteopathy or chiropractic?

Jake Cooke 37:04

Excellent question. And so the research in humans isn't there to say whether because he can't do that that clinical trial. But I would say that based on the physiology, if if you were to ring me today and say I've just had a whiplash, should I take some painkillers? Absolutely, you should, as long as they say for you, you know, as long as you can tolerate I prefer and stuff like that. But we want that inflammation to come down as much as possible, even though there's just taking paracetamol. But yes, we want to reduce that barrage of pain as quickly as possible. And if that's painkillers, great, I would definitely make the recommendation. You can also do it. The difficulty is with whether you're doing it with a manipulation, let's say with whiplash, because that's such a good example. If the joint is screaming pain, because it's just been sprained. We don't want to do an adjustment close to that,

because anything that's going to sprain it more is only going to fuel that fire. We do know with manipulation, we get global analgesia. So absolutely, if it's my neck, do you want to adjust my thoracic? absolutely go for it. We know we're going to get a reduced, we're gonna get increased pain inhibition. So that would be a good a good way to do it. I think sometimes, certainly in my profession, traditionally, traditionally, there's been a a hesitancy for recommend medications that we want to avoid them. Well, yeah.

Steven Bruce 38:26

We can come from a background where we don't want people to take medication. Yeah, sometimes it can be helpful.

Jake Cooke 38:31

Absolutely. The research on this in in the short term is they're effective in the long term, they're not. So same with with back pain, we know that if you're taking it, if you've had pain, pain for three months, there's no point taking your your painkillers on a daily basis, they're not going to do anything. But with acute pain where we've had a whiplash or something like that. Absolutely. I would say you want to take something to reduce that pain in the short term.

Steven Bruce 38:54

Right, where do we go next?

Jake Cooke 38:55

So if we were to look at rather than these kind of more severe on sets of pain, like whiplash. Instead, if we look at something more like this, when we're actually looking at the neck and the head. The reason I like this, that diagram is not because of all the fancy labels, but if you look at the greater occipital nerve, up through here, can you see obviously, you got some, some kind of fascia there, but you can see how just below it passing through muscle. So we have that all over the place in the body where nerves are passing through muscles and fascia. Even if they're not passing directly through the belly of the muscle, they might be passing through a tunnel between muscles. So another classic example would be the brachial plexus, where we've got all these nerves C five c, one passing out through the scalenes down onto the clavicle, under pec minor down to the arm. So what's going to happen is when we have hypertonic muscles, changes in posture, changes in posturing of a joint. We can compress these tunnels, compress these nerves, and the first thing that's gonna happen was when you touch a nerve, it's gonna is not reporting some pain. And if we leave that there, it's gonna come pain sensitive. So you will have seen with a brachial plexus for example neurogenic, break neurogenic Thoracic Outlet Syndrome. So you touched gently here. And the patient immediately says Ouch, that shouldn't really be the case. So if you imagine if you try to drown me, you shouldn't stick my head underwater and 10 seconds later, I'm dead, right? I should have a few minutes in me before my brain says okay enough, it should be the same nerves. So if it was compressing nerve at the carpal tunnel, the brachial plexus, you shouldn't immediately say, oh, I can feel it in my arm, or are my arms gone numb? When we have that scenario, we know that there's probably already some level of compression. When we compress a nerve, we reduce his blood supply, we reduce its ability to get rid of waste products. So we basically get a Deema. So when we press it, the nerve is already little bit starved, and I put a little bit more pressure and it goes on that. So we have that throughout the place throughout the body. And obviously the brachial plexus is a great example. But if we come back to the, if we come back to the head, we have all over the place. When we're talking about chronic pain Earlier, I talked a little bit about dermatomes. So let's say I sprained see five, what you're going to start seeing is that I'll initially say it hurts at C five. And then at that stage, a

centralization comes in, now I'm going to have pain to my shoulder. So now when you come and touch my shoulder, I can say it sensitive but it should only be in C five. If you come down to the C six, seven times it should be fine. When secondary hyperalgesia occurs, or we have that potential pain sensitization, CPS, if you want it in your notes, and PBT is paintbrush thresholds just in case I start dripping with lawyers, I might start drawing them, what will start to happen is the pain sensitivity will spread down through the downtown. So they first see five hurts, and then we're going to get painted see six, then C seven C eight D one. Now the patient will will complain of pain in those areas when it gets severe enough, but initially, they might just have more peace of safety. So you'll come down through these areas. And as you squeeze them, they'll say why? Yeah, that's actually really sore. Now we're not just looking for it's a bit tight, we're looking for Ouch, that hurts. Or, yeah, that sore too. And we'll we'll show that later. That is literally what you're looking at is you're seeing the physiology of pain spreading down through them times. And unfortunately, it goes all the way down. So you could have someone who has whiplash, and now they have pain all the way down to their back, you'll see these reduced pain pressure that goes all the way down through the legs. So you can squeeze anterior TIB in someone has whiplash, and they'd say out the same way they would with their shoulder. So we're seeing that pain progression. The beauty of it is that when you treat them if you're doing a good job, you'll see it regressed too. So they'll start saying no, not so much. Not so much. No. Or, yeah, that's still way down there. And then hopefully, a few weeks later, you can get back up into the shoulder. So hopefully we should literally see is it reducing? Now it's interesting from a diagnosis point of view, because how many patients do we see with radiculopathy. But their sensory motor and reflexes are all normal. But based on the symptoms, you've got neck pain you've got radiating our pain must be radiculopathy. The question is, is there actually any nerve involvement there? Are we compressing the nerve at all? Or is it just they've hurt their neck? It's been painful while now they've got this particular pain? Whether it's easier to treat or not, is the question because chronic pain is not. You know, it's not something you just switch off.

Steven Bruce 43:22

If you've got a sort of a rough idea of you've done a successful manipulation that see five, how quickly will this all start to regress,

Jake Cooke 43:32

if you can treat the primary sites of the pain that can have remarkable changes, say there was another study where they took a bunch of chronic whiplash patients, I talked about whiplash a lot because that's where it's chronic low back pain and a lot of chronic pain researchers and whiplash the two big ones, they did an interesting one with whiplash where they basically put, again, lidocaine into different preset joints, if they could find the primary site of pain, within an hour, the patient's symptoms, or those secondary sites of pain reduced, like 80% reduced. So went from my whole right side hurts to Oh, yeah, this is still a bit tender. But actually, this is much better. So if you can really find the primary site and significantly reduce it, it really a lot of that physiology changes very, very quickly. So it's good. Exactly, yeah, it's, that's why we do all the patients is the, the difficulty is finding that primary site, and making that significant change in one game. So by the time you've seen them, if they've got all that secondary pain, we're gonna see changes in movement, changes in behaviour, all this different stuff. So you might not be able to do the adjustment the way the way you want to do it. And that pain reduction has to be significant. So it can't be I do the injection and if there's a little bit better has to be doing the addition with an hour. Wow, my neck feels much better, although secondary signs change very, very quickly. So if we can do things where we can really make significant changes quickly Then then absolutely. And we know that all of us have had some miracle case like that where a patient comes in saying I've had two years of pain. You know, unfortunately,

you as much as we may not like it, but tick tock and YouTube is full of these kind of wonder monitoring was right. Someone walks in or crippled one justement they've do handstands on the way out every patient that expects us. Exactly. Yeah, yeah, exactly. But when those do occur, and that's because we have this drastic reduction in pain efforts.

Steven Bruce 45:28

Can I put a couple of points through from from the audience, Pip says that she thought that the more recent advice was to avoid anti inflammatories in the first 48 hours, because inflammation has a function in the healing process.

Jake Cooke 45:39

It does, I would go on the severity. So if it's, I was lifting my kid out the bath, and I tweaked my little back my low back, and it's it's painful. And we don't suspect you know, he's just airlifted out no problem. If it's I've had a car crash at 30 miles an hour, if we think of the physiological processes involved, that drastically different, if you think so one of the you know, what the leading cause of accidental death and injury worldwide after car crashes and motorbike accidents is

Steven Bruce 46:12

to be cheeky as a chiropractic intervention. Falls, right. Yeah.

Jake Cooke 46:18

So literally falling over. So historically, falling us trees while trying to gather fruits or catch monkeys or whatever was falling, chipping downstairs, all these kind of details. The reason they fall so devastating as the physiological stress on the body is far more than we can achieve by lifting up a chair, or, you know, you'd have to bash me in the head with a mace or something to get that. So absolutely, she makes an excellent point. The inflammation is an important part of that process. But if the pain has been very severe, then we know that pain processing is occurring very

Steven Bruce 46:51

quickly. So I seem to remember from years ago, the research that certainly the research that was being fed to osteopaths was that the anti inflammatory slow down the healing process, but actually, in the long term, there is no difference in outcome. But if the in that first Medknow, 48 hours, few days, whatever it might be, you can provide enough pain relief so that people can move more easily or more normally, then that's probably helpful because the movement is as important as anything else. Yeah, absolutely.

Absolutely.

Rob has said the engagement of the GABA system is helpful.

Jake Cooke 47:22

Yes. What's he talking about? Pain inhibition. So basically, just kind of calm things down. But there's a very clever, was a very clever neurology geek, who's who sent in that that question, Rob is very clever.

Steven Bruce 47:36

I know which Robin is, that's not.

Jake Cooke 47:37

That's not a comment that comes up in day to day conversation. But that's fantastic. So again, I think a lot of what we do is pain inhibition. So we know that just having that conversation with the patient, no disrespect to GPs. But if you have five minutes with a patient, and they want to tell you everything that's happened in warehouses, how it's affecting them and out the impact on their life, you can't really do that in five minutes, I can just say, What do you want, okay, I can do that. And rule

Steven Bruce 48:05

a rule out the things that are going to kill you, and then give you overproof, it seems to be the always the cause. But, of course, what they have to do is rule out the series.

Jake Cooke 48:14

So just listening to someone, and having that connection with them is going to increase that pain inhibition. We know the frontal cortex has literally a hotline down to the spinal cord that inhibits pain. That's why, you know, Joy is a great pain inhibitor, because as you start to experience joy, it's hard to feel a lot of pain and depression. So any scenario where we can only just touch right, you know, these days, we've so, so closed and and professionals are not the right word, but just physiologically, just touching the skin on skin has a big impact. You know, holding hands with your partner has a big impact. You know, hugging your child, you know, all these things that just a few minutes a day of having contact with someone. So I think whether intentional or not just putting your hands on a patient and just listening to them attaching it, you are helping that pain admission, you

Steven Bruce 49:05

your professional mind, we're both told, but probably for different reasons. But I mean, communication is very important. And all those things are part of communication. And I've always thought that you're a hiding to nothing as a GP because by the time a patient has been told to wait, however many weeks it is before he can get an appointment or she can get an appointment and then speaks to a very unfriendly receptionist and sits for an hour or two in the waiting room. They're in a really bad place by the time they see the GP for their five or seven minutes, whatever it is, and that can't be helping with the overall healing process. And my point there is that the whole process with us starts from the moment they go to your website, speak to your receptionist speak to you, you know, how long do they spend in the waiting room? Is it a nice waiting room, all that all those things are going to help with this inhibition process? I would imagine Absolutely.

Jake Cooke 49:52

All the pressure is on the receptionist, you know when they when they arrive, that's where it starts. They want to feel welcomed, and this is a warm, friendly place and we're glad you're here. What's some cold? You know, whatever, take a seat I

Steven Bruce 50:03

think in the NHS world too often certainly in days gone by receptionists were told, you know, your gatekeepers your to stop people coming in rather than to welcome them and empathise with other. Absolutely.

Jake Cooke 50:15

So my my waiting room, we have things like this lovely essential oil mix that just, it's just subtle because I have I have a lot of migraine patients and headache patients and we can have a lot of olfactory sensitivities. So we have it just, it's just there, it's in the background. And every few days somewhere as well as lovely in it, you think great. It's just all these aromatherapy things, you know, just that, even if they don't consciously you were aware of it just to get them in that kind of state of almost like a spa, you know, you go into a spa, I genuinely think all the joy of a spa is that you give yourself permission to relax and be there. So it's not that the spa isn't really that special. It's no better than a hot bath, really, whenever I go to a spa, maybe once a year with my wife. And every single time we just end up sitting in the jacuzzi and having a chat. You've got all these amazing different therapies. Actually just sitting in juicy and having a nice hot bath is the best thing. But at home, we don't give us permission because we're so busy. And when patients come into our office, they're giving themselves permission to kind of say, this is about me, I'm going to I'm going to invest in something.

Steven Bruce 51:16

We're getting off the topic of neuro testing here. But just do you feel that there is a danger? Obviously not in your own practice, you wouldn't do it. But if you make your reception area, your practice your treatment rooms to spa like then it detracts from the patient's impression that you're there to help them overcome their problems.

Jake Cooke 51:33

They are professional. Yes, yeah, there is a line isn't there is a grey, grey line. But there's a line somewhere between a fuzzy line Yeah, yeah. It'd be like if you if you practice from home, just trying to have that you don't want your picture of your kids on the wall. But you've want to show maybe your your a family orientated person, but you're not trying to say, you know, I've just put up a bench in my living room and on my wife's watching TV over there, it should be, you want that professional might be very welcoming to be seeing at your home. But it should be a professional setup. So when we're coming back to things like this, where we're looking at this, this diagram here, and whether we're looking at this one here, or whether we're looking at the brachial plexus, one of the things that really influences this, these muscle compressions is again that that descending pain inhibition. So if I have chronic pain, we lose that descending pain inhibition, and what will start to happen as well as muscle tone will start to increase. So talking of homes, my my wife works from home most of the week. And her office setup used to be that when I walked into it, I'd be facing the back of her head. And I could tell just from a posture, whether I should engage in conversation or whether it's just back away slowly and pretend I never came in as because the stress system just activates posture changes body language, right? I mean, it's so basic. But I think that's something sometimes we don't pay enough attention to is these these subtle sensory motor cues. So when muscle tone increases, it tends to compress rates and a lot of muscles are going to run across at least one joint or multiple joints. And when they can contract, they're going to compress. So if you now chop my head off, for being a terrible gas, and you cleaned my head straight off, my body wouldn't just kind of like relax into its place with it, all the muscles would would tighten up those vestibular neurons in the spinal cord would say, No, I think sometimes when we think about the brain is I want to close my hand and a signal goes from my hands to his muscles say turn on, when actually it's much more complicated that the first one your hands want to do this. Sorry, the cortical spinal tract, those lower motor neurons want to do this is the upper motor neurons that saying, Hey, chill out, don't don't do it. When we have chronic pain, we have chronic stress, anxiety, depression, we lose that descending inhibition of those lower motor neurons. And they're allowed to come to a little bit more tension. Now not enough that my arm suddenly goes into spasticity, but enough that every muscle is tighter,

often is going to be that flexor system. So think of someone who's stressed at work kind of hunched behind the computer. So when we come back to this diagram of the brachial plexus, we're going to increase that flexor time, we're going to compress these these nerve compartments. So again, if we're having this constant trickle of pain, where these nerves are constantly getting compressed, we may not have had a whiplash or sun disc herniation. But we kind of just have this constant compression where this this pain system is trickling. And now actually what used to be some tightness in my neck and shoulder has now developed into my arm is sore and my whole right side of my back is sore. If that pain process goes on for long enough, it starts to mirror. So initially, I might say the whole of my right side is painful. And then we can say actually it's mirroring onto the other side. And then from there it becomes something like fibromyalgia we have this kind of widespread pain. So when we're looking at these pain points thresholds, we know that someone who has a single episode of low back pain will be able to take more pressure than someone who has recurrent low back pain. So I hurt my back a few times a year, they'll take less pressure before they say ouch before someone who's hurt their back was someone who has chronic mild low back pain will take less pressure before they say out to someone who had recovered. And it continues to say someone with severe low back pain takes less pressure than the mild and some were Fibromyalgia has less pressure than than all the others. And

Steven Bruce 55:32

you said we know this on the basis of good quality evidence,

Jake Cooke 55:36

good quality correlational studies where they basically take different pain syndromes. Have you seen a algama term? Where you basically input see how much pressure? Yes, so what we have witnessed you do not? That's exactly so basically, they'll just make sure that the the person has put in same amount of pressure, each time for controls, and then basically look at what how much pressure everyone else can take. But there's been quite a lot of research on onto it. So it's not a lot. It's a new new thing that I've come up with. But it's no

Steven Bruce 56:12

and I wouldn't mind if it were a lovely new thing that you come up with. But of course, when we're trying to explain things to patients, we want to make sure that we are telling them stuff, which is based on evidence, you know, it's in the chiropractic code, it's in our osteopathic practice standards. And of course, if we want to talk to other health care professionals, we got to make sure that they don't say, Oh, this is just your theory about pain. And you would say that because you're in manual therapy today. Yeah,

Jake Cooke 56:35

you always got more more to pray for him. I quite like

Steven Bruce 56:38

those those numbers, as I'm not sure they were called, he was calling them ergometers. But they're I mean, they were they were Power Pressure tools. But then we also had the same physiotherapist came and demonstrated some really good Bluetooth devices for measuring movements as well. So you could do rotation of the head side bending of the head and flexion of the limbs. And of course, it gives you a fantastic objective answer to just what difference Have you made to this patient after one session or when they come back in at the next section? Yeah,

Jake Cooke 57:06

absolutely. And that is something we should see is you should test before and after your treatment. And so with chronic pain, obviously, we're very unlikely that we're going into treatment or they're getting up and all that stuff has gone. But we should see if these secondary hyperalgesia is present, that there should be an improvement. So let's say I had pain all the way down to 70, squeezing my finger off that is really sore, you then do the treatment. And hopefully, you should then be saying, Oh, actually, that's not bad. That's fine. Fine. Oh, yeah, that's all. So we should see this, this regression. We all see the kind of instantaneous change in motor rates. So someone came in like this, you do your treatment, and suddenly that is all nice and soft. That should be the same as his nerve. So if we've if we've compressed the brachial plexus, and they've instantly got pain in their arm, we should do our treatments, and hopefully, see that even if it's not resolved, it took two seconds for me to say I can feed it my arm. And now it takes 20 seconds for me take them out and let me know that the nerve is already a little bit more alive. So I think we see these changes. It's just about recognising formalising it basically, and sometimes with patients with chronic pain, it can be very hard because it you know, it can be for six weeks before they start to see a significant improvement. So if we can show them over that four to six weeks, I know it still hurts. But look at this improvement in movement, you know, like, exactly, you can move your neck and now you can or look at this pain improvement in pain. So I know your neck still hurts. But can you see how it's gone from your whole right side to really localise. So if that pain can regress, then then communication is the key thing. They know that nothing worse than a patient that you can see huge improvements. And by the fourth trim, they say it's not working. There's nothing nothing worse than that. You're looking so much better. Like how do you not see this, you look so much better. And yet, because they live with it every day they don't, I always think it's like driving a car. If you using the brakes every single day, you don't notice them getting soft. And then when you have them replaced. First time you put your foot on the brake, you kind of go straight to the window. It's like that if you've had pain all the time. So if we have the incremental improvements, you may have been nice for six weeks. Yeah, we've

Steven Bruce 59:15

done quite a bit of the background on this, you want to give us a bit of a demonstration on how you go through the testing process. So we'll go over and we'll meet our model grace. Thank you. Grace, thank you for joining us this evening.

Jake Cooke 59:30

Say I don't need to teach you how to palpate but I'm sure everyone watching has a good sense of how much pressure I should be able to put on before before Grace's out. So naturally, if I suddenly put all my weight into it, she's gonna say ouch. But equally, she shouldn't be saying ouch with as much pressure. So when we're looking at when we're doing palpation Absolutely. We want to look at what's the mobility of the joints and muscle pain and stuff. We also want to say to a patient can you say tell me if it's painful? And then, yeah, so you can feel us a little bit tender. So let's say she's my whiplash patient. If she has pain here, what you'll start to see is it will start to spread down to the shoulder here. So then we do the same amount of pressure through here, she'll start say ouch, as well. Now, it's not tender. You'll see that out. Yeah, that's all. Now, primary hyperalgesia is that we have pain in the injury site. So I'm going to change scenarios. Let's have torn this muscle. So primary Hubbard uses this is painful, but the muscles around it are not pain and not more tender. So oh, that saw? No, that's fine. Yeah, secondary hyperalgesia is where the tissues adjacent to it or below it start to have more to. So Grace is a tennis player. She's injured this muscle. And let's say two weeks later, I palpate her and she does or really saw to me, that's not great news, it probably

means there's some aspects of that centralization occurring. And then we come down into the currencies, five dermatome. And she says, ouch, ouch, ouch. And then you want to really go for the belly of the muscles? And you basically say, is that solar? Yeah. And here, okay. And then we're going to come into the sixth, again, you're going to try and get right on to the belly of the muscle. So that no, not so much. Yeah, a little bit. But it's not like and that's a really good point that grace is making. When it's the dermatome, it's not going to be all that sore. But that's not it's that saw that saw that saw Oh, yeah, hour or so what we see with with Grace is more more likely to be as a peripheral issue, mechanical, neuro mechanical issue, however you want to describe it. But that doesn't mean she's in chronic pain state, right? So it'd be the same. Let's say she's got pain from C one. And we see C two, C, three, C, four, C, five, C, six, C seven, all this is saw, if you could just turn around a little bit for me with grace, that's great, thank you. Let's say that pain has now spread all the way down to kind of, let's say, T seven. So she's saying or are all all painful. And then this is all fine. And then we get to the low back, and she starts saying Ouch. Again, the physiology does not jump areas of the spine, right. So what it means is that we have central pain sensitization in the upper quadrant, then it stops at T seven, and then she has a low back issue as well. So when we're doing a treatment, we want to treat low back, but, but know that that's not part of the same thing. So when we're doing palpation, it's, it's that kind of that much, right? So it's just the tip of your finger starts to go a little bit a little bit white, it shouldn't be that your whole knuckles start shaking. And I'm teaching you guys that the obvious things is the same when you come into the brachial plexus. When we compress. It shouldn't be that we're, it shouldn't be that we're really squeezing it if Grace if you tell me is that tender? Doesn't go down your arm? No, no, that's good, right? She shouldn't be saying yes, straight away. And we should be able to hold from sight. So does that start to go down your arm template? Basically, let me know does it start to get a bit on your back? Okay, so that's interesting. So when we're looking at all these nerves, the physiology I said earlier, we'll go down through the downtimes. So if we have a situation here and compressing here, and she's complaining, it's going down her back, that's not the brachial plexus coming down the arm, right? So instead, we have different nerves like the dorsal scapular nerve. So again, dorsal scapular nerve is going to pass under Levator scap and upper traps, it's going to get compressed between the two. So if we have someone who's a little bit stressed and kind of holds their shoulders like this the whole time, we compress these nerves and realise that so when I could squeeze in here, again, she shouldn't within 10 seconds or 20 seconds, not saying it's going down my back. It means we have enough I'm a little bit pokey grace from mind. Is that a bit tender in there? Yeah. So if we're looking towards the scapula there is this beast comes down the back of the medial border, scapula and it branches, branches, branches, branches. So a lot of patients when they're saying they have this horrible Burnie pain around here. These things is obviously is it a rare visit, it's joint but sometimes we need a little bit higher and look at these nerve entrapment sites. So we can have that all over the place. One of the reasons I love that that diagram earlier with the with the occipital nerve is if a nerve goes upwards, so we compress somewhere and she says it's going up into my head, or maybe I compress around here and she says it goes up into her ear up into her face. Central pain says the nation goes downwards. It just goes down to the damn time. So if pain goes upwards, it almost certainly means you're hitting a peripheral nerve. Right? And luckily, peripheral nerves are pretty, pretty simple to to treat, we find that the entrapment site, myofascial release works really well. So there's good research for looking at myofascial release with a median nerve at the elbow. So whether you're doing manipulation trigger During myofascial work in particular seems to have good research for it, whether you're losing using things like low level laser to get it going. But anything you can do where we will see pretty quickly that we compress it not paying us now, you will find a laser. Yeah, I have I have a low level laser. It's a bit murky the research on it, because there's, it's like having pizza, there's so many different pizza types. And there's so many different ways you can make a pizza, that you really need

to look at the research and say, Does this device have the research back yet? And I think there's some great, great devices and there's some waste of time. What's so

Steven Bruce 1:05:35

good, again, to interrupt before you go on, Lawrence. So this is about radiating pain. What about referred pain?

Jake Cooke 1:05:41

It's been saying it's in my mind. Yeah. Same thing. So referred, if I'm compressing peripheral nerve, it's gonna refer into that damage. So like with with grace, here, we compress this now that refers into its into its sensory distribution. But if I, if someone has referred pain to their arm, that for me is that pain sensitization? Do you claim that second secondary pain sensation, and that is the root of your pain. So when we see a patient that says she's got this C seven radiculopathy. If there's no sensory changes, and there's no motor changes, reflex changes, I think there's a very strong argument to say, it's not a nerve compression radiculopathy. It's a pain sensitization, which is, perhaps very good for the patient maybe doesn't make such difference that to them, but it does to us. I think this is where you would have seen the research on MRIs and it's a very poor correlation between what you see on an MRI and pain. I think that's where it comes from. So you have this you know, it's happening less and less Now, luckily, but in the old days, you go in, you have an MRI is a whopping great big disk. That's the only operation. What do you mean, your pain is worse? Well, the pain is worse, because you already had this fire of pain, screaming pain, and then you went in and cut it, you know, basically tore my finger off, right? You took a system that was already super pain sensitive, and just set it on fire. And so the patient comes out with with more pain. So that whole failed back surgery syndrome. I read a study once it said, when you look across, it was a meta analysis, they said tend to a systematic review, sorry, it was 10 to 40% of patients going in for back pain surgery come out with the same or more pain and they went in with this probably because that pain sensitization is very active.

Steven Bruce 1:07:22

Interestingly, for ones, though, patients going for surgery will almost always think on the positive side, they'll say, Oh, well, that means that 80% of people go better. And I'm going to take that risk as I've got this raging backpack. Will you sell me wants to know about Hoffman Stein? Will you get onto that at some point? Yeah, okay. Yeah, absolutely.

Jake Cooke 1:07:39

So first, we talk about the low back, the passing flow back is a little bit was exactly the same, but just make sure we all know it. So if you've just added yourself a little bit more grace. All right. That's great. Thank you, if you cross your arms over your chest, Yep, perfect. So let's say we're looking at the low back and she starts complaining of pain here. When we come down through the hair, the only difference you can make is it's quite good to assess the patient with them sitting, I'm just gonna fill the top you like him. And we're just gonna work through the dermatomes. So you basically just say same thing. And again, it's not going to be it's a bit tight, because I went for a run yesterday, it's out. And you're basically just work through those times. Not about and then you're basically just gonna walk all the way down onto the top of the foot and then onto the bottom of the foot. So you're literally going to go l 2345. S one, S two. So you're linking back up the back of the leg, s one s two, you don't need to go to s three is four because it gets a little bit awkward.

Steven Bruce 1:08:39

Does the research show that there's fairly good reliability about the dermatome maps? Because I've seen books where they are vastly different? And you said it'll go right to the edge of the dermatome. And then it won't into the next day. And so but where is the border between? They

Jake Cooke 1:08:53

are blurry? Yeah, yeah, they are blurry. So yeah, you don't have to be. You don't have to be in your mind. Similar particular. But as long as you're. So we're grace, as long as I see that pain is is regressing back through a general downtime assistant. Yeah. Good question.

Steven Bruce 1:09:09

But yeah, you said earlier on, but this won't grow up with so you might get a problem at sci fi, which will eventually work its way down there. If you've got a problem with the numbers, it's not going to work its way up just fine.

Jake Cooke 1:09:20

The only scenario where that occurs is if the pain develops in something like fibromyalgia. So if the pain is really severe, and then we start getting cognitive changes, behavioural changes. So remembering that Fibromyalgia is like brain fog, changes in sleep, stomach issues, all these different things, then then it can but that's you. That's your outlier. That's your extreme. It's kind of the everyone's sad expression, but it's the thing that proves the rule. You know, I don't understand why that expression is a thing, but that's the scenario where someone has, has developed into Fibromyalgia rather than just rather than just pain.

Steven Bruce 1:09:54

Okay. What makes with Greece so

Jake Cooke 1:09:59

The number of pain sites is an important one. So if grace comes in to me, and she says, I've got neck and shoulder pain, I've got some low back pain, I've got knee pain. She is someone who's at far more risk if you sit back from him. So we want to look at some areas that are richly innovated and one of those is the jaw. So if we're talking about headaches, for example, we know that the number of more pain sights we have in the body, the more likely we are to progress into headaches. So if Greece comes in, she says, I just have headaches. And then twice a month, she's super safe. If she starts saying I'm having 10 to 14 headaches a month, she's in a high risk of developing chronic daily headache, or chronic migraines where it's 15 headaches a month, or more than 15 headaches, more than eight migraines a month. The problem with that is that migraine can last 72 hours. So you could have someone who basically for three days at a time is having, what 24 days a week, 40 to 24 days a month is having a headache and migraine. So the jaw is important one to look at as well. Richly richly innovated. And is that a result? No, not really good. And I'm just gonna have you open your drawer for me, please. And again, open? Yeah, great. Now, it's been some interesting research with this pain. So what are you palpating you're just looking at your feeling for clicking, popping, and then obviously feeling the pain around the masters. And then the other place we want to look at is around the temples. So is that tender there at all? No. Good. And hear? No. So there's been some interesting research looking at. When people have temporomandibular dysfunction. What is the likelihood that develops, there's a strong relationship between TMD and headaches, and TMD and body pain. So when we talk about this pain system as being distinct, you know, pain from the head and neck is gonna go into the trigeminal system. But actually, when one system is on fire, the other system senses are smoking as well. So I think osteopath do quite a lot of work on on Jaws as well. I

think there's a lot of credence and or credit to it, I'd say that one of the criticisms of chiropractors is that we often think that it's kind of see wonder. And then if we miss, if we miss the stuff above see one, then you've you've made some issues. So when we're looking at neuromuscular examination, the big things that I think both professions could do better is looking at iron, iron head movements. So we've got the visual system, we've got the vestibular system. So the brain uses your eyes, ears and feedback from the body. So visual system, vestibular system, proprioception to the sensory maps of your body in your environment. So to understand who you are, where you are, and how you interact with things, you have to have these systems working well. Your brain uses these systems to compare kind of what is the sensory environment now. And I compare that to my previous experiences to make predictions about the future. So if we have changes in the visual system, or vestibular system, then we know we're gonna have changes in spinal time. So when we're looking at new mastery examination, if let's say aggressive, you just slumped forward for me. And just rounded shoulders, you obviously have lovely posture and don't have your own shoulders flex and forth like that. When we see a patient is from a mechanical point of view, it can be very easy to say, oh, okay, you've got increased flexitarian, reduce excessive tone, and you know, bad posture, we just need to try and make make you do this, but we can adjust her back every day of the week. But if we don't recognise that maybe she has a vestibular issue. So the vestibular system is your chief extensive time. And so a lot of our patients are going to be here and if we ignore the fact that we got poor visual system or vestibular system, then they're going to keep keep something now

Steven Bruce 1:13:40

strangely enough, my my guest on last Monday, two days ago was was talking about vestibular rehabilitation. We're running a course on it next year. Yeah, because of course, there's a real skill as being able to analyse that vestibular system before you even get on to the rehab. Yeah,

Jake Cooke 1:13:53

it's a it's a big thing I do actually a bit a big part of my work is chronic pain, chronic dizziness. So if we were to look at dizziness, if you've got just get your shoes off me. So I said dizziness, we'd only have to talk about this has been just talked about postural control. So if you stand up for me, please put your feet together. Okay. You're going to close your eyes. So normally, the first thing you're going to do with the assessments is what someone walk to have healthy gait. You have to have a good muscular system, skeletal system, sensory motor integration, good visual system, vestibular system, all these different things cardiovascular system. Now we don't have the space to do it here. But open your eyes. What's lovely with braces. When we're standing eyes closed, there shouldn't be a big difference between eyes open eyes closed. The control your balance is the ability to keep your centre of gravity over your base of support. So if I bring the base of support very narrow by having my feet together If my control of balance and posture is good, there shouldn't be a difference. If I have my eyes opening closed, there will be a slight difference, obviously, I'll have a little bit more, but it shouldn't be drastic. When most of our chronic pain patients, you'll see as they shut their eyes, they'll start really moving around. When we have chronic pain, we often lose proprioception. So the next step will do is ask your chest and you're gonna stand up onto your right leg. Good. So with patients, when they're standing on one leg, we want to see how they got a hip ankle strategy. And with chronic pain, what you're going to see is an ankle strategy. So because the back is painful, the intrinsics maybe aren't working. So well. The extrinsic start bracing, compressing peripheral nerves. So now when grace is sending one foot, this is all tense. So you can't make these subtle adjustments to control a balance, right? So if you stand on your right leg, and everyone in our clinic should be able to do 10 seconds eyes open. When you close your eyes, your balance, you know, unfortunately

falls off a cliff. So eight into that, how are you 1616. Okay, so we don't actually have the data for her. So 18 to 39, increase your ace 18 Close your eyes for me.

Okay, try again, I would say one error with neurological testing is people take the test once and then base their diagnosis on it. So we want to always give someone a benefit of doubt. So if you were to thank you just relax for a second, if you were to hit a reflex, and it's a bit brisk the first time, that might just be they're anxious, and they've not had that done before so that they're tense. So hit it a few times. Equally, if it was normal the first time and it dies off. That's not good either. So I would say in my field, there's a big issue with if you've hold your hands out like this, eyes closed, if we do a finger to nose, so you can touch the index of the tip of your first finger onto the tip of your nose. So that was Demetrius, so she was hypo metric, she stopped too soon. If I do at once, I can now say, Hey, you got a cerebellar lesion, you know, you're doing to a life of misery. Do it again, eyes closed, you see how she improved second time. So I realised that we have something called efference copy. So efference copy is every time I do a movement, my brain predicts what that movement should feel like. And then it monitors what's happening in real life to what that prediction is. So the first time when grace does it, how often does Grace spend her time with her eyes closed touching your fingers, who knows? Not that regular. So the first time she comes in a bit short, if her brain is healthy the second time, she should now update that that efference copy. And it's

Steven Bruce 1:17:33

smoother. Which is why I think when we're asked to do that test, people are asked to do it several times, absolutely and different. Opening because I embarrassed myself,

Jake Cooke 1:17:41

yeah, and different copies, different versions of it. So if you put your hands up, so first you do eyes open and eyes closed, and do it a few times. So go, I suppose first thing, your left hand, and then come back first thing, your right hand, and then come back. Okay, we do that a few times, then we say open your eyes, relax his hand, do this hand, you're gonna touch your nose, then touch my finger is open. Now, keep going. You're gonna do a few times on the same target. And then we're going to start moving. So when it comes to all assessments, I think there's that we want to look at static. And we also want to look at dynamic. And then the hard one grace is I'm gonna keep my fingers still the you're going to close your eyes. So do a few eyes open. And then close your eyes. And this is a really great test because we're kind of monitoring her ability to update really quickly. Anyway, I've digress. If we're looking back at balance and pain, if she's got chronic back pain in particular, we tend to see a reduction in balance. So the worse the back pain gets, the worse the balance gets. So as she stands on one leg, you'll start to see the ankle doing a lot of the work because the back muscles is super stiff. As her back pain goes down, you'll see change the movement pattern. So now she starts to make such changes. And she does really well. So if you cross your arms over chest again, let's go on to the length of time. And then eyes closed. So you see she's maybe not finding it. She's not super easy, but she's still making these subtle adjustments which is great.

Steven Bruce 1:19:15

Good, so you're happy with subtle adjustments? That's good. Yeah,

Jake Cooke 1:19:18

we want to see we want to see adaptation. So if you have a I've got a patient who is a national level gymnast with dizziness is bizarre that a guy who says he's Dizzy can then go on to those tumbles for your relief and do all these things. And yeah, he says, although in day to day, he feels dizzy. He's

trained that pattern so well, but he can still do these main things. And it's hard to work with because when you do these tests for him, he looks perfect. You know he's actually stable and yet he still has this perception, isn't it? We got spacey, haven't you? So static balance is great, but we want to make it dynamic. So if you're walking this way you can do eyes closed. Let's do eyes open. Sorry, that was cool. arms across your chest. You got to walk kills to grey. So you're gonna make sure that you touch your heel to toe every single step, don't let any gap between them. So she's going to do 10 steps, the way we're going to measure an error is if her feet separate this way. So whether there's a gap between them, whether they're not perfectly in line, or whether she crosses her arms. So that's very good, come back this way. And the eyes closed this time, please. So that's why they're

great and relax. So that's not easy. It's very hard test. If people are homeless, try it, do it in a safe environment, we're gonna see a relationship

Steven Bruce 1:20:39

through shoregroup. She's not abnormal. Okay,

Jake Cooke 1:20:42

so out of 10 steps, eyes closed, we expect three errors. Marissa is a hard test. The core features of gait are gait with stride length and speed. So gait, which should be less than 10 centimetres. So when we see someone walk into our office health and receive chronic back pain, they walk in with their feet wide apart. Again, it's because they're not got these micro adjustments anymore. So they can't keep their basic grip their sensory support over their basic centre of gravity over their bases, boards. So instead, they start to widen the feet. It's a bit like if I was to walk across a frozen lake, I'm not going to do it, you know, just like this, right? I'm gonna hunker down and really kind of keep my feet on the floor. And that's what we see with one of our our back pain patients. So they have this slow shuffling gait. When we do tandem gait, it's such a hard test, because we've made the, the gate with as narrow as it can possibly be. So now my my control of the muscular system has to be perfect to keep me out. And then we've really slowed it down. Do you know what are the biggest risk factor for falls or in one of the best biggest risk factor falls is is slowing your gait down. So bit like riding a bike, pretty easy to cruise along at 10 miles an hour, but one mile an hour is really hard to keep

Steven Bruce 1:21:48

pace with people who feel unsteady, it's instinctive to slow down. Yeah.

Jake Cooke 1:21:52

So they go wide base. And then they want to keep the reason they slow down, right is they're trying to keep their foot on the ground as much as possible, you sometimes see something called a magnetic gait, where their feet literally, a patient last week said, she said, I think I have gecko feet. Because I just cannot seem to get my foot off the floor. And what's happening is subconsciously, her brain is saying, I've not good muscular control here. And I'm not gonna let you lift that foot off. Because when I'm when we're walking on one foot 90% of the time. So to have a healthy gate, I have to be able to step onto one foot beyond that foot for about 9% of time before I fall onto the other foot. So with that patient, her brain has I don't want to fall, so I'm not gonna let you get it off. Good. Any questions? Yes. And if

Steven Bruce 1:22:35

we've got a question that goes back to Lisa, which we can deal with in the moment, we were talking about Hoffman sign a minute ago, I was thinking about your routine for just basic neurological

testing when someone comes in, you know, what the what are the cues to do that? And what are the best ways to do?

Jake Cooke 1:22:52

So let's say, grace in your patient, the first thing she's going to do is walk when you walk me to just take 10 steps

Steven Bruce 1:23:00

that have to be little otherwise you go scream? Yeah. So

Jake Cooke 1:23:05

let's not worry about those kind of weird steps you just tried to make up. Let's just try and do five normal steps. Okay, so just come back this way and take imagine that no one's watching and you're walking to the bus stop. That is still a very nervous nervous steps. Although I

Steven Bruce 1:23:18

do think that whenever you say to somebody, could you just walk normally if we they know they're being watched? Yes. Like walking past a crowd of kids at a bus stop. Yeah, they're all watching me.

Jake Cooke 1:23:26

So in your orgy, the magic number is 10. Yeah. So for any particular reason, why not? It just comes up all the time. Yeah. So when asked if I have asked a question, and you don't want the answer is, if the audience wants to guess 10 is the gonna be the answer. So the research says 10 metres, who has 10 metre clinic, you know, 10 metres long way. So a more risky thing is 10 Snap so intense that you can see see what non gated, so we can see with her there, she narrowed her gate width, because she's, you know, everything's tight. And we've been talking about a lot, she really reduced a stride length to speed. That could be how a back pain patient presents, you know, this kind of like really, but still, it's an anxious and anxious gait. So what we want to see really is a nice step. Now there is normal ranges for this stuff. But if you've ever been to an airport or a supermarket, I mean, in fact, even grace is a great example. We all know without measuring it on it on the floor, we know that her stride length was too short. Equally, if you take comically long steps for me, please grace. That also looks strange. So without me getting a measuring tape out and saying oh, I should be 120s element. So as stride, this is a step. The stride is this foot to this but again, so there are normal ranges and I tried to connect for a while with a measuring tape down the road. And eventually I was like, This is ridiculous. I can just put stride length is reduced is never increased. No one ever walks doing a kind of Monty Python type.

Steven Bruce 1:24:52

I'm just thinking here that I don't need most of my patients who've got back pain to do this to know they've got bank back because they've told me they've got back so While you're doing so,

Jake Cooke 1:25:04

when we're looking at neuromuscular control, the movement should look effortless and pamper, like, right, so it should look really smooth and easy. So if if your back patient patient comes in, when they say back pain doesn't really tell you anything about that physiology. So if I had two patients, one is both sitting down, one is dying and what's commit suicide because the pain the other is like, it's one out of 10, less than 10. We want to class them. So when we're looking at gait and movement, it helps us understand this patient has got significant issues, it's going to take a while this patient's

going to be, you should be able to say to a patient and then at the end of the initial consultation, in two to four weeks, you can be feeling so much better or wrong, this is going to take two to three months, or I need to bring in a psychologist and all these other people engaged is one of those things. So when gate when grace is walking we have if we see changes in gait with, we know she's got a change in balance. We don't know why. But if back pain, you'll see it go wider. Could you come to somewhere in the middle here. And if you face that way. So there's been loads of different assessments where they look at different types of Balanced Assessments now, standing heel toe or selling wrong bugs is not a hard enough test. So we have to do standing one leg, there's another assessment we can do which is quite nice one called four steps square test. So if we were to put two bamboo sticks on the floor and a square, what you would do grace is going to step forward onto this step sideways onto this one backwards onto this one sideways into this one and then reverse that order. Okay, so we go loads of research looking at the timings on this, but using this you can differentiate between Parkinson's not Parkinson's, Ms. Not Ms. Seen all gays, all these things. So we're gonna have a name, I haven't heard the four step square test for subscribers. very imaginative, sexy name, where it's

Steven Bruce 1:26:54

a much easier thing to understand that when someone says rom bugs or Hoffman's or whatever, and you've got to think, Okay, what was that one?

Jake Cooke 1:26:59

Yeah, yeah. So when we're looking at chronic pain, we want to look at these patterns. And you do make your point and I was what's the point? The point is trying to understand to that patient, what does it what that you, you understand what they're going through, and that you understand how long it's gonna take you better. If we see, let's say, Grace, if you turn this way, for me, let's say go we go back to that palpation. And she got this pain down the entire right side and it's now spread all the way down to the leg. That's where we want multidisciplinary approach. So if you work in a clinic where you have osteopath, chiropractor, physio, maybe a psychologist, I would say that I work on my own and one of the weaknesses working my own is that you tend to try and take on the whole but workload recently, I was invited to team up with a what not team up but join a group of vestibular rehab specialists. And then now they've got vestibular audiologist, neuro physios, psychologist, you name it. And I hadn't realised how stressful it was walking on my own until I could say to a patient. I don't know this bit, but I know someone who who does. And then off they go. If we go back over there, there's a little bit of this on PowerPoint. I'll take you through

Steven Bruce 1:28:05

that now. Oh, okay. Now, yeah. Okay. Interesting what you say there, because I think a lot of people, especially newly qualified are very hesitant about saying they don't know something to a patient. And yet, we had a very eminent spinal consultant in here some time ago. And he was asked a question, he said, I don't know that. It's not my expertise. And he had no qualms about this. And it's really refreshing because there's not much that man doesn't know. But he's perfectly happy to admit it when he when he doesn't.

Jake Cooke 1:28:36

Yeah, absolutely.

Steven Bruce 1:28:37

I think that comes with confidence, isn't it? Yeah. Which we all like when we come out of college and possibly for some of us a lot longer? Yeah.

Jake Cooke 1:28:43

So one question, I think it's an interesting one is when we ask people, how do how does the Aussie how to ask you about help. So how do you guys reduce pain? Actually, same with chiropractors. I think people know the general idea. But actually, if you were to ask, what does it actually do? Not a lot of people can actually put their finger on it. And one thing I wanted to show you is if we look at this diagram here, if we're looking at the simulate the nerve root coming up from spine, they got the ventral ramus and the dorsal ramus. And on that dorsal ramus, so the one that's going backwards, we're going to have a medial and lateral branch. So that medial branch new neurosurgeons do like a nerve block. Yes, that's what they're doing right? Because the medial branch is upset. But if you look at all that muscle, all those intrinsic and they make all those extra mix. The nerves are passing through them. So when we're talking about those nerve compressions earlier in this development, chronic pain, if we have a scenario where the intrinsic aren't stabilising the spine very well. And now the extrinsic saw are being recruited to help or we have chronic stress. So now we're increasing muscle tone all the time. We start to compress these peripheral nerves as they go through muscle. So that's where you're palpating patients back and they're saying out it's really tender, or, frankly, patient eyes on the bench and you can see their right to spine is standing out off the bench. You know, it's going to hurt when you touch it, it hurts because these nerves have become super sensitised. So when we do our adjustments, I think part of what's happening is as we stretch those muscles, and we have that relaxation associated with it, decompress those nerves, and other things that we can use for that. Vibration is quite a nice one. So vibration is going to improve that proprioception. Now the research from vibration shows that it's short term benefits. Not many long term studies say that it has you know, that it has a long tail of changes. But it's a nice one to use in your clinic week. And let's say you're so sensitive, I can't touch you very much vibration sense should go through the proprioceptive pathways. So it should be painless. Now, if these are very sensitive, it can hurt so but when we do patients, you shouldn't be using vibration thinking. I'm going to like push this down to your back and loosen up these muscles. We want to use vibration and get the speed up nice and high and use it as a proprioceptive input.

Steven Bruce 1:31:03

What do you use for that?

Jake Cooke 1:31:05

I have a I have a thing.

Steven Bruce 1:31:13

Screw that I've asked your question and then go straight over your head. Yeah, we use a Thumper in my clinic, which is, it's quite a nice massage kit. Yeah, with little lumpy bits that actually go up and down. Rather than rotate, I used

Jake Cooke 1:31:25

to have a I used to work at a clinic, they had a Thumper machine, and the one I have now is just a single head, the speed isn't as important as you think the important bit is that the patient feels it as vibration. So like you said, the lumpy kind of rolling once, that's not going to have the same effect, right, because it's not activating the same pathways. So we want to do vibration, because we want to really kind of activate this proprioceptive pathways. When we're asking grace to balance, if she

has really bad bouncing back pain, it's because we losing that proprioception because all those intrinsic and extrinsic, so just hypertonic. We talked about laser, that might be a good option now, because you can see how these these nerves, they start very deep, right, but they're coming up into these very peripheral areas. Now haven't got a diagram for you today, because I don't want to overwhelm us with too many diagrams. But these are giving sensation to the skin. So what you can see in this diagram is all these little branches poking through the skin. Yeah, so I think part of the reason that things like low level laser work is you're, you're, you're hitting these peripheral efference desensitising them, yes, and then giving you a window. And so I would often do laser first. Before doing an adjustment depends on the pain sensitization though,

Steven Bruce 1:32:35

we've had a few people ask about which low level laser you recommend, I mean, maybe maybe recommend is the wrong word, you have one that you use.

Jake Cooke 1:32:45

So there are so many different brands, so many different options, I would say that when you look at the research on it, we've got the 400 to 700 nanometer wavelength. So when we look at all lights, it's all on a on a long, long spectrum of wavelength 400 700, the energy is absorbed by the mitochondria. So that the the energy producing parts of your cell absorbs that it remember how proteins work. So you have like these misfolded proteins, they can't fire. What happens is the when mitochondria, they when they're compounds on there absorb absorb the energy, they go back into a better shape, and they start producing energy. Again, I think the reason that low level laser with a 400 to 700 nanometer wavelength works is because we know there's mitochondrial function go down COVID was a great example of that. So COVID your you have this infection and your mitochondria shut down. And basically become a little bit like an immune cell, you have a reduced energy production. So let's say I have the flu, I don't want to be producing a bunch of energy, I want to just, you know, dedicate more resources to getting better. But we know that a lot of medications cause mitochondrial function, chronic pain, unfortunately, it can cause it depression, you know, all these different things that can affect it. So when you have the 400 to 700 nanometer wavelength, what you're doing is, is up regulating the mitochondrial function in producing more energy which allows the nucleus to produce like a signalling cascade Mr. Lee to say, hey, we're in better shape. Let's show up. Thanks.

Steven Bruce 1:34:16

So in answer to the question, unless you were looking for 400 700 nanometers, rather than, say, a particular brand,

Jake Cooke 1:34:21

if you go 800 to 1000, you're moving more into the the wavelengths gonna be as well by water. So we've got water and obviously all ourselves. So as the water absorbs energy, it starts vibrating more as it vibrates more it creates heat might be super low level heat, but there's heat there. And then what's gonna happen is blood flow is going to come in to disperse that heat and that blood flow is gonna bring with it energy, proteins, carbohydrates, all that stuff which will help. So they both have their camps. So you if you have an 800 to 1000 Fantastic. The only only reservations with with the 800 The 1000s is there, even though it might be super low heat 1000 is infrared. So you're going to heat production there. So you want to have a little bit of think of what's the injury type is. So I see quite a lot online of people doing 1000 nanometer on concussion, they've only got like three lasers on someone's head. I would be a little bit hesitant about that thinking, it might be low heat you're

putting in but do you want to heat up brain tissue, same with nerve injuries. So if I've got a raging carpal tunnel, is it helpful to heat that up while some lasers have both, so some will have like a 600 nanometer wavelength and 800 nanometer wavelength. And the last thing to say on it is, whether it's a real laser, or when it's an LED, so a True Laser. If you imagine we're sitting this in the studio, and we put an LED light bulb above you, we see all of you. But you probably also see some of me and we see some of the TV because that LED scattered, it would bounce off, you bounce off me and go to the camera so people can see us. So you see you in clear. And you see these kind of murky shapes around led bounces. It's not all in one line. Whereas if I put a laser above you and shine it onto your head, everything else we darkness, and we see this little laser point on your head, because laser all works in exactly the same is exactly the same, exactly the 600 is exactly the same. So the idea with laser is that the the energy output is exactly one wavelength, and it's absorbed much better, right? That there is not going to bounce off your head and then hit me it gets absorbed by your skin. So the idea is that with LED, you often need higher wattage is or higher milliwatts to make up for the fact that the energy is not being absorbed as much. So you have to, but the problem is with more more energy, more wattage, you get more heat. So it's a complicated subject. In my realm, I work with a lot of concussion patients stuff like that. So I have a laser that's at 630 was at 410 and 630. So I have very low and it's just like a blue, blue light and ultraviolet light and a red light.

Steven Bruce 1:37:11

Okay, just going back to what you said earlier about vibration, Kathy has sent in one word, she says hypervolt.

Jake Cooke 1:37:17

I thought, yeah, that's it.

Steven Bruce 1:37:19

Thank you, Kathy. You might do I'll give you a name. I didn't read out surnames, generally just so people can be feel free to say whatever they like. Yeah, that's great.

Jake Cooke 1:37:27

That's that's exactly what we'll have. Yeah, good for five years and hasn't broken.

Steven Bruce 1:37:34

So you've got more certainly, so I have a few questions for you, which might take us off this topic somewhat. Or you might be 15 minutes left. So now

Jake Cooke 1:37:42

there's not a huge amount more to that. But if we're looking at this, again, you can just visualise the idea of when we're going down through the spine. As we're palpating each of these different dermatomes you're gonna see that pain in different areas. And so just try to when we look at your anatomy, you want to get to a stage where you can look at a patient and have this slightly weird thing of seeing them and then seeing the pathways as well. And so when I'm palpating impatient, it's not just Yeah, okay, CSL here. I have this kind of weird representation in my head of, okay, at the level of the C seven spinal cord areas, all syndromes and stuff. So I'm going to focus the treatment that I know, osteopaths are very holistic as well. And there's, there's a lot of advantage to that. But we really want to focus in on getting the if you can, whatever the primary site is, as much as possible. That's going to be the best bang for the buck, rather than focusing on Oh, you know, back's a little bit tight. Let's do half an hour of massage, when really the pain is much higher. Yeah.

Steven Bruce 1:38:41

S f g, I don't know who SFTS is, what courses can you recommend progress in neurology?

Jake Cooke 1:38:46

So my, my first my post grad diploma was with the Carrick Institute. So they're American basically out of them.

Steven Bruce 1:38:56

I haven't until I looked at your bio. Yeah, so they're,

Jake Cooke 1:39:01

originally were a chiropractor who started Professor Carrick, but now they have all kinds of intermediary learners with them. So they're a great I still would say that they are probably the hallmark for Borat. Yeah, I'd say in terms of the best of the best, they probably still have the gold standard. And then there's courses here as well. A lot of them are online. So they do have some guys who come and teach but I'd say a lot of the better material now is online. Especially the stuff with people like David trust. Nate Kaiser, cherish Mo, they're already kind of world class. When you listen to the speak, they are fantastic on cardiology Fastpasses on your orgy fantastic. You know the the Impressive, impressive jobs.

Steven Bruce 1:39:49

Yeah, good. Okay. Interesting one here from Jason. Jason has asked what the link is with trigger points.

Jake Cooke 1:39:57

So trigger points I find an interesting topic. And I've wondered for a while really what is a trigger point? You know, is it it's not like there's a physiological lesion you can point to right. So we know it's tender. And we know it's saw. And we know it refers, I think there has been some interesting studies where they've with cadavers, basically peel back skin, and the guy is actually doing the, the, whatever the dissections and stuff, they will often find where the nerves are by palpation. So they'll look for trigger effectively trigger points. And when they find where the where this tight bettors and they know they found a nerve, and it's often where it's passing through fascia. So for my mind, when we talk about trigger points, I think probably what you're looking at is a peripheral nerve passing through muscle, or fascia. It gets impinged there, we get a buildup of a demon, it swells the actual nerve itself become swollen. And that's why you can feel it. You'll see with headache patients, that when their headache is really bad, you'll be able to palpate the nerves on the head. So like copper, so you'll come you come around here, or you come around here, if you just run your finger sideways. classic one is if you try it yourself now, you guys try at home. If you come here, the supraclavicular just pops area, if you run your finger back and forth, you might just get a slight sense this kind of flat thing. So sometimes when patients report pain coming into their chest, if you palpate that you'll feel it feels like copper wire. So nerves generally should feel quite flat. When they're inflamed. They go like copper. And I think often when you find trigger points, it often feels like that you feel this like little nodule, and then when you work on it, you're stretching the fascial stretching the muscles, you're really relieving that edoema And it goes. So I have I don't get a whole bunch of hate mail from from trigger point therapy people I think probably it's a it's a peripheral nerve that's becoming trapped through through I wonder if

Steven Bruce 1:41:49

that's why Jason asked the question. I mean, we've run a number of courses here. primarily about dry needling, but dry needling all focused on trigger points. The two experts we've had one is an osteopath, Simeoni Alaska, the other is Professor Bob go. And he's an American neurologist, and a very eminent neurologists from the Johns Hopkins in Baltimore. Yes, they've defined what they mean by trigger points. But also, Bob has come up with some recent research showing that yes, they do exist the council all the naysayers who deny that that trigger points exist. And of course, it's not it's not completely cut and dried. But certainly the needling that they teach and practice is effective in dealing with the referred pain patterns from those and Simeon. Together, we have developed a 3d app trigger points 3d To show the pain patterns. And it is a phenomenal app.

Jake Cooke 1:42:43

So I've I've seen some other things where they will look at those pain batters. And then if you were to look at some of the peripheral nerves, it is remarkable how often those pain patterns those referred pain follows the nerve. So you'll see you know, like your palpating, around like the QL. And you'll see it Pam paint, paint that input into the, into the, into the adapters. We've got like the gen two genitive femoral nerve that passes through a bunch of fascia and the comes into it. So it's I find it very interesting. And it's not saying that they're not their own in independent thing. But I think quite often you'll see, if you were to then pull up a map and look at look at the nerves, you'd be like, Oh, that really? So with Grace back there, you read something say that was a trigger point, referring pain and back. There's also a whopping great nerve that runs down. So I suppose the answer is you treat it and if it goes away, that's the most important bit really, rather than that. That's

Steven Bruce 1:43:38

the point of what they do as well. As they're teaching. They're teaching you find a trigger point or tend to point in a taut band of muscle, you treat that trigger point. And suddenly all those referred pain areas cease to be painful. And they stay not painful as well.

Jake Cooke 1:43:51

Yeah, one thing if we've got time, I was just like showing this last diagram. So if we're looking here at, we've got the visual system, we've got the vestibular system, bringing it up on the screen for you. Alright, so we've got the visual system, we've got the vestibular system, and we've got spinal cord. So what's happening is when we this, if you look at the name here, this medial launch, you have sickness, that actually is an outdated term now. So mele MLF just see me saying that over and over, actually goes into the spinal cord and up to the eyes to help me move my eyes opposite to where their eyes move. Or to link. I'm saying that to me, let me say that again, if I'm looking at you, and I look to my left is my MLF. That connects, create enough six and three, right? So when we have MS or something like that we the MLF is is richly innovative. So the reason I'm harping on about this is it's one of the first pathways in the entire brain to modulate and it's one of the most densely myelinated that isn't by chance is because that information has to get from the ears the eyes extremely quickly. So if I was you know, hunting you down, as we're running through the woods, and we're doing all this I need my eyes to stay on you because if you're wearing camouflage as my head moves, if my eyes move off you then as I look back you've got you have a very vivid imagine moving anywhere. When I'm teaching, I literally will talk to me like if I shove a spike through my ears, everybody shut the heck anyway, in this thing, the reason this is an interesting diagram is they call this the MLF going down to the spine. So the idea is we get this signal going from the vestibular system down to the spinal cord, largely extensive time. This is our data. So now we call it the vestibular spinal tract. The reason that anatomist used to call it the same thing is because it's also incredibly densely

myelinated. It's also one of the first things to modulate. So when we're talking about posture and pain and things like that, we talked earlier about how people we can look at their tummies just thinking cracking their back until they straighten up. But if we've got a loss of vestibular spinal activation, you'll always hear slumped, think of old people, right. So as you get older, you will have to be start to step forward. So when we were chiropractors, and osteopaths, we want to absolutely make sure things are here. But in terms of, if I've got too much flexitarian, it's gonna be really hard to get out of pain. So we want to start looking at him. And, you know, maybe the lessons that people learnt from the vestibular rehab, I think, are critical to try and get them to strike now.

Steven Bruce 1:46:04

We could go on for hours, I'm gonna give you two questions, and you've got about 30 seconds on each given the time we have left a little bit more than that. Stu says, regarding postural hyper kyphosis is the Ponto medullary medullary reticular formation inhibited

Jake Cooke 1:46:19

everyone other geek, hyper or hypo, hyper hyper. Yeah, so you're gonna have if we think a bit more simply, same thing, reduce vestibular spinal activity, now vestibular system is going to fire into the brainstem, it's going to connect with a whole bunch of stuff. So the vestibular system is very interesting. If we look at the eyes, we know it's going to go to one area and then be passed on. Because the years it goes to the auditory system, the visibility system doesn't have one home, it goes to at least 10 different areas of the brain. That's because if you it's sensation drives movement, movement drives evolution. So the vestibular system is one of the very first sensory systems we had. And so it goes all over the nervous system. So when we have a change in vestibular function, we get a change in posture, we get a change in memory, emotion, we get brain fog, we get anxiety, all these different different stuff. So yes, is

Steven Bruce 1:47:12

the good. And this one, I think this will be a hard one to answer quickly. Morag would like more information about the about vibration as part of therapy treatment, how long do you do it for over multiple areas? palpating change are the questions that you

Jake Cooke 1:47:27

say we want to avoid habituation. So if you were to put vibration on my knee and leave it there, very quickly, my brain is going to habituate to it. So you want to be moving it around the some some machines that will vary in their in their speed. And that basically is to avoid habituation. So you're going to either have something that changes variation, or you're going to be around the beauty of vibration as it spreads through the tissues. So you don't have to be super accurate. So let's say let's say it's sacral pain, you can do it on the glutes and know that it's going to be spreading into the into the SI I would do it in my clinic. And then so many patients have bought these things. Now they must be like one of the Wonder toys from the from the last decade. So I'll often say to people you can do at home, do it for a minute, expensive. Depends on your price range, I would say the things that are in the 20 3040 pound bracket, they're probably a waste of time, they're made with plastic parts, and they break quickly. So once you get up to about the 100 pound mark, they've just been made with better motors. And as the most of the bands out, the professional ones probably are probably around 200 300

Steven Bruce 1:48:35

pounds, I think we shouldn't seem to recall we've recommended a number of people by thumpers numbers have been a really reliable branch. The first one big and hefty, and you don't need to put much pressure on them to feel the vibration going through the the tissues,

Jake Cooke 1:48:46

you're not going to use vibration if it hurts. So if you're putting vibration thing of that pain system, we don't want to pour fuel on the fire. So vibration should be well, that feels nice. If you do it and they're kind of going Asti sensitive, then it's not having an effect is that pain system is too aggressive. So you do something else or maybe vibrate a non tender point. Is that

Steven Bruce 1:49:07

right? We have run out of time, I'm afraid, Jake, but thank you so much for coming in. I'm not entirely sure we aren't done. Of course I was expecting this evening. There are questions sitting over here in a column that I've not even got to which, you know, they're on a completely different strand of neurological testing. So maybe we get you back in sometime and and maybe we do some more on vestibular rehab at some point. I don't know but so pleased you made it in time this evening. I know you got held up on the on the routine by car crash I think, didn't you. And everybody's very grateful for what you've shared. We've had 530 People watching so it's clearly a topic of interests to osteopaths and chiropractors out there as you as you'd expect. So

Jake Cooke 1:49:42

I thought today is such a big subject that I think pain is why patients come to see us. Yeah, so hopefully, I thought it'd be focused on pain and the process behind it. So hopefully, I mean nothing today is probably completely groundbreaking, but if it helps you understand what the processes are, how to predict if someone's gonna get better or worse. And then hopefully that's helpful. I

Steven Bruce 1:50:01

always enjoyed talking to somebody who really knows their subject, you know, it's something that I could never have been accused of in my own time. So thank you again. And, of course, thank you for joining us this evening.