



## K Laser - Ref217

*with Stephen Barabas*

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### TRANSCRIPT

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**Steven Bruce**

Good afternoon. Welcome to the Academy of Physical Medicine, we have got a great show for you, an extra show in our calendar this lunchtime. It still counts as 45 minutes of learning with others, CPD. A few things before we start, I'm going to be talking to Steven Barabas about laser therapy. Now, he's a representative of the K laser company. But this is not specifically about their product, I suspect we'll learn just how good that product is. But this reflects laser therapy generally. And there's a lot of technology behind it and quite a bit of science behind it. And I've actually got an 81-slide deck, hidden away somewhere in the gallery, which we aren't going to be showing you, we're going to show you a few slides from that gallery, from that deck. But what I will do is I'll give you a handout afterwards. So we'll be bringing the slides up on the screen next to me, Stephen will be talking about all sorts of technical stuff to do with lasers. And afterwards, we'll have one of those as a PDF handout. So don't get too worried if you can't follow everything that's on the slides right at this stage. Why are we doing this? Well, we're doing it for a number of reasons. First of all, laser therapy has come on in leaps and bounds over the last few years. And in fact, I can't remember whether it was a year ago or somewhere about then. But we had Stephen and one of his colleagues on the show to talk about laser therapy. And even since then, laser therapy has changed. And he hasn't told me how yet but he's going to in a while. We were looking at buying lasers from my own clinic, we're still looking at buying them for the clinic. And so you know, what we're very keen to do is explain why they're useful as an adjunct to our physical therapy, how you might use them in your own practice, if you wanted to get your own laser equipment, or even how you might access laser therapy through other sources, if you don't actually want to invest in that kit in your own practice for the time being. So that's kind of set the scene what we're going to be doing today, let me introduce Stephen. Stephen, you've got all sorts of fancy titles on the website and things like that. You're a fellow of laser therapy or something.

**Stephen Barabas**

Oh, there is a British medical laser association. So yeah, I'm involved with them, which represents the whole of the medical laser industry in this country.

**Steven Bruce**

And your background is what?

**Stephen Barabas**

I'm actually a veterinarian. So I graduated in Glasgow, all the rest of the family of doctors. But yeah, I went on the veterinary route. And I was looking for technologies, which would help me in treating osteoarthritis. I mean, I used to be the tech director of the big pharmaceutical MSD in the USA. But even though I still use nonsteroidals, that's only part of what I'd like to offer. And so on the human side, and on the veterinary side, we do much more of a multimodal way of treating pain management and osteoarthritis.

**Steven Bruce**

You are still in clinic, then?

**Stephen Barabas**

I still do one in two weekends, which keeps me real.

**Steven Bruce**

Yeah, which is really important, isn't it?

**Stephen Barabas**

Incredibly important.

**Steven Bruce**

Very often we have, when we're talking about things may be similar to laser, when we have people come in, you're either on the technical side, or they're on the clinical side, but you've got a lot of both.

**Steven Bruce**

I think it's important because when I'm sitting here today was not something pre planned, it kind of like the rest of life, it sort of flowed into itself.

**Steven Bruce**

I thought you were talking about this broadcast, and we planned this broadcast, but we only told you last week you were coming into the studio.

**Stephen Barabas**

That's true. But you know, in regards of just my general philosophy on how I'd like patients treated, it doesn't matter whether that's a human or an animal. You know, we're lucky to be in the UK, we're lucky to have that desire to go and improve human health and animal health. And therefore, whether it's pain medicine, or it's rehab post sports injuries in there, they overlap.

**Steven Bruce**

Well, I'm impressed that you're wearing scrubs for the interview, because we have got a model lined up for you to demonstrate the equipment and I suspect he's getting quite nervous. But why is he wearing scrubs? What's going to happen in here?

**Stephen Barabas**

Yeah, there's no operations today.

**Steven Bruce**

Okay, let's get on to the lasers. Laser has been around for a very long time. And lots and lots of people have got lasers or have looked at buying lasers. And there's a whole spectrum of prices and whatever. So first of all, let's start with the technology. What and how does laser actually do?

**Stephen Barabas**

Well, first of all, thank you for inviting me because unlike pharmaceuticals, it's a very poorly regulated market, any medical equipment has a lack of scrutiny in regards that all you have to prove is safety. So I think it is difficult for your audience today. You know, I hope they enjoy the lecture, but it's important that they do their own scrutiny of what they're spending their hard earned cash on. And also making sure that what they're buying is actually going to really benefit their patients and not just ticking a box. And that's an important aspect about it.

**Steven Bruce**

Yeah and one of the things that I wanted to get out of this discussion really is obviously a look at what the equipment itself looks like because people possibly don't know just how bulky or mobile or portable it is. But also to give them the criteria by which they might decide to buy K laser or they might decide to buy some other class three, A three, B, class four lasers, because all these terms are bounced around. So it's very hard for us mere osteopaths and chiropractors, and so on to keep track of what it actually means. Actually, I'm probably speaking very personally from there, when I say it's hard to keep track of, I'm sure that you have a perfect idea of what all these things mean.

**Stephen Barabas**

I mean, we could use some slides as an illustration, it might help the audience a bit. If we went to slide two, first off, this might give them an idea about how it operates. So, the word laser stands for something. It stands for light, amplification, stimulation, emission, radiation. Radiation in this current climate with Putin doesn't sound very good. But actually, there's a lot of safe radiation out there as well. And this is what we're using in laser therapy. The critical world is photobiostimulation. And it's the use of these wavelengths of light to actually biochemically change things within the cellular and physiological structures.

**Steven Bruce**

This is how therapeutic lasers always worked.

**Stephen Barabas**

Regardless of that. Since then, there's been lots of different words banded around, so you talk about low level laser therapy and high intensity laser therapy. But the truth of the matter, what you want is a laser that is able to go and change things biologically for the better in the body system. And do it in a timeframe that fits in with an osteopath, chiro, physios, timescale massage therapist. And that's a critical thing, it's, you know, within our own laser, we have both low level and high intensity lasers. And that's because you don't need a high intensity for the skin. But in order to do things in a time efficient basis, you need a high intensity laser, in order to penetrate deep into the tissues and do it biologically.

**Steven Bruce**

Can I just pick you up on that. Not pick you up, just go back a little bit. You said earlier on that medical equipment isn't well regulated, other than for safety. And you've just mentioned that osteos and chiros and physios and massage therapists can use laser technology. When they come to get insurance for it, are there any hurdles that people have to jump through to prove their competence with the therapy?

**Stephen Barabas**

I mean, we work very closely with the insurance companies, not all insurance companies will cover it. But the majority do. And as long as they have got all the training certificates, and they've got the proof that the actual company has not just dumped a laser with them but gone through the whole process. And there is a thing called the core of knowledge, which they need to set. And if they've proven that, and they've got the certification on their specific machines that they've bought, then insurance companies should be able to go and cover them.

**Steven Bruce**

Right. Okay, sorry, I interrupted.

**Stephen Barabas**

So if we go to slide 18, first, second, sorry, then that will explain a little bit about what's the critical aspect in regards to lasers themselves. Slide 18 here, what that's trying to show you is the actual, what you're showing is the molecules, okay? So here in this one here, these are the critical molecules, so whatever laser you're looking at, they need to have wavelengths that are peak absorptions of these areas. So, you know, we all think about green plants, and chlorophyll and plants look green, because of the absorption of sunlight. Well, these molecules all have a colour, whether they're in the infrared in regards to water, which water has a colour in the infrared, or copper in cytochrome c in in our mitochondria, or iron in hemoglobin. And obviously, we know the colour of melanin in our skin and our hair. But each of those has the absorptive capacity. And they're all titled this thing called chromophores and they're light absorbing molecules. And when they absorb that photon of energy from light, then they can create and replicate what the body should be doing. Whether it's an osteoarthritic joint, or its healing skin, or whether it's a tendon injury, and you put in motion aspects of what the body should be doing, and make it more efficient. And that's what the energy of photons is doing, absorbed by these different molecules in the body.

**Steven Bruce**

And can you target which ones you wanted to let by?

**Stephen Barabas**

You can, but you know, if you look at what we're trying to do here, in targeting water, the most common area where water is actually in the circulation. So you can open up capillary beds, and that's really important for perfusion to heal. But it's also important to get away the waste products. And if you're in an osteoarthritic joint, it will reduce the inflammatory cytokines by just improving perfusion. But in doing that, it's then going to bring blood there. And you know, if you've got osteoarthritis, or you've got post surgery injury, you may not be very active, but we can trick the hemoglobin to dump oxygen there. So now you've got the nutrients, you've got the oxygen there. And now when we target cytochrome C, we can raise the cell metabolism, whether that's a neurocyte in your spine, or whether that's a tenocyte in your achilles tendon, or whether that's an osteoblast. And in doing that, then we can improve the functionality.

**Steven Bruce**

And does that mean you would have to decide which of these you are targeting?

**Stephen Barabas**

No, in our laser, which covers all four areas, we would do that simultaneously at the same time. All of them working in unison.

**Steven Bruce**

Okay. Good. I think I understand that now. New words for my vocabulary chromophore.

**Stephen Barabas**

Indeed, no problem. And if you look also at the previous slide, which is slide 15. And that kind of ties in in the whole aspect about it here. So what we're talking, sadly, in this strange world, we live radiation as a word that's coming up now, but we are what's called non ionizing radiation. Okay, so we're in this visible, which is where the red light is for treating melanin in the skin, but also in the invisible, which is in the infrared sector. And there are specific molecules you saw on the previous slide that we can then target and go and improve the cell metabolism, as well as the physiology of the patient. What we're not is ionizing radiation, which is on the far left, which is the X rays, the gamma rays and the UV, so we're not damaging tissues, we're not causing any issues in regards of the body itself. We're stimulating healthy, healing processes.

**Steven Bruce**

So what is it with the men in black glasses that we have to wear when we're using this?

**Steven Bruce**

Well, I think they're more on the ionizing side of things. So we're not getting there today.

**Steven Bruce**

No, but we have to wear glasses when you use it the techniques.

**Stephen Barabas**

You do. Yeah, sorry. True. You do need to because we do not have a visualise change in our iris because we do not perceive infrared, unlike some of the animals in our planet. And therefore, we blocked out the infrared, we can still visualise the read, which is around 660. And therefore, we can see where we're aiming the laser. We're blocking out the potentially damaging infrared, which our eyes won't be able to detect, therefore we don't get an iris constriction.

**Steven Bruce**

Right. Okay, I understand.

**Stephen Barabas**

Okay. There are other aspects about lasers. So wavelengths is the most important aspect about it. And if we looked at slide 12. 12 is going to look at power. And you kind of talked about this earlier. So you are right, lasers have been around a long time, you know, I could have shown a slide of Einstein and his theories of lasers and the potential benefits and negative side of certain lasers.

**Steven Bruce**

You must be the first person ever to pass up a chance to put a picture of Einstein, usually looking very disheveled and saying something...

**Stephen Barabas**

We only had so many slides I could show. So in regards of this, this is an American National Standards Institute. So that's why it's called AMSI. And it's what the whole world has adopted in regards of measuring powers of lasers. Okay. And, you know, from, if I was in a lecture here, I'd be using my laser pointer. And

obviously, that's not damaging, it's a very, very low power, it's only up 2.4 microwatts, which is a tiny amount.

**Steven Bruce**

Which is laser printers and..

**Stephen Barabas**

Laser printers, you don't need goggles when you're doing your computer or anything else like that, or even looking at this TV screen. But when we get up to class three B, that was the earliest sort of biological lasers, which were sort of developed in the 60s going up into the 1990s. And that was deemed as safe in regards of what you could do from a therapeutic point of view for patients. The downside was the amount of time it took to be able to do that. So you can do some excellent work in regards of acupuncture, using lasers, and a class three B, even a class two sometimes could be used to utilised for that if that's what you're really interested in. But if you're trying to go and do deep, muscular skeletal tissues, and you're trying to do joints, and you're trying to do backs, especially, then the advent from about 1998 in Europe and 2002 in America allowed class four lasers to be deemed as safe for therapy. And that's the only legislation out there really.

**Steven Bruce**

When you say safe with the bunny ears it makes me think you don't believe it's safe.

**Stephen Barabas**

No, I do believe it's safe, but a class three B laser can also be dangerous if you shine it in someone's eyes. So, all of these used badly could cause some problems, especially in eyes. And therefore, you know, whether it's a class three B or a class four, you still need goggles. We ourselves as a company deem that we only sell into the medical trained professions and the manual trained professions because we want to make sure that they're using it legitimately and they're using it properly. And they understand both the disease and the way of using the laser to get the best results out of it.

**Steven Bruce**

These pictures at the bottom of course are showing that there is a broad, broad range of what class four lasers actually include.

**Stephen Barabas**

Absolutely.

**Steven Bruce**

Shooting down aircraft, etching steel or whatever that thing's doing.

**Stephen Barabas**

Yeah, surgery and then here's a Greek football star going and treating his inner groin for problems.

**Steven Bruce**

Is that your poster boy, Rafael Nadal?

**Stephen Barabas**

We do. And I was very happy about the Australian Open. Yeah. To see someone come back at 36 and defy the odds and win that. And he has very bad patellar tendinopathies. So not surprisingly, built like an ox and you know, a good 30 years running around tennis courts does damage to you. But the fact that we can keep him ticking on with a good physio team means that actually, you can still play at that level. And, you know, obviously limit the amount of playing time he does, but he's back playing at that level.

**Steven Bruce**

That's a good sort of lead in to talk about what you can actually address with laser therapy. Okay, so we've got a tendinopathy there.

**Stephen Barabas**

So as the first or the second slide I was showing you in treating the hemoglobin, the mitochondria and the circulation, where you target that, you can improve the overall aspects of tenocytes, myocytes, osteocytes. So I think that's the hardest things for people to judge because we're so used to popping a pill, and it knocks out our receptors for our pain. But actually, we're doing a lot more than this, we're actually, it's a bit more like an anabolic steroid. But legally, we're able to go and boost all of the tissues. And when you target over a certain area, you still need the compliance that you'd use with a drug or with a manual therapy technique. But when you have the compliance and the right laser, then you can really improve the overall tissue functionality, physiology and the overall clinical results.

**Steven Bruce**

And I'm going to make a broad leap here, legal, not least because there are no significant adverse side effects, which there are with anabolic anabolic steroids.

**Stephen Barabas**

Understood.

**Steven Bruce**

So are there any adverse side effects?

**Steven Bruce**

The side effects would be eyes, which you've alluded to already. And because you don't have a blink reflex for infrared, you do need to wear glasses, as does the patient. And they are different distances away. So most people working within clinic the people working in that room would need to wear goggles, it will be different distances to different lasers. But in regards of other aspects, we have got some data which we work with the Dental Association, where we've shown that you can safely use it post squamous cell carcinoma removal, which is quite a big leap of faith, were you thinking about a stimulator. But we've done studies on 101 children with squamous cell carcinoma and not cause recrudescence of the cancer. I still would be a little worried about doing it directly over cancer. But some of your clinicians who are watching today, you know, if there is inadvertently an osteosarcoma or five fibrosarcoma, we're not going to cause that to go and get even more virulent or melanotic or malignant. Sorry. Yeah, yeah.



**Steven Bruce**

I would address some of these questions that are coming in. The first one is, this has come from a chap called James who hasn't given us his surname, but he's online and he's sending his best wishes from Skiathos in Greece, I think maybe he was taken by the picture of the footballer you showed a minute ago. Lawrence says I had an older 70s patient of late who commented that she'd received laser on her neck for OA. And she mentioned that her neck was sore for a while before she gained benefit. Is that normal? And how does it work on such deep structures?

**Stephen Barabas**

Yeah, I mean, we can all demonstrate it later. Susie is going to help us today. Can I show you, to answer that question, dosage, which is slide number 20, because I think that will illustrate why it's important. Because different wavelengths will penetrate different depths, the best penetrating beams are around the 800, around that area. And if your clinicians who are watching today, were only treating skin then they probably wouldn't be watching this thing, but most of them are dealing with deep pain and chronic pain and some acute soft tissue injuries. And what this is showing is the dosage you need. And in order to go and get dosage, you need a lot of energy and that's in the energy of the photons. So you're turning light energy to chemical energy within the body system. And you can see that that actually is quite a high level. So someone like that neck pain you're talking about, you either need a lot of time, or you need more power of the machine. It's those two compromises. Hopefully you've got the right beams to start with. And those are the two differentials in regard to that.

**Steven Bruce**

When I think about dealing with chronic soft tissue injuries, very often I'm thinking well, I'm going to have to reinjure this in order to stimulate a healing process. Is laser doing any of that?

**Steven Bruce**

Your analogy there is more analogous to shockwave.

**Steven Bruce**

But also, to manual therapy.

**Stephen Barabas**

Indeed, manual therapy, where you're provoking a reaction to try and stimulate healing. I put a good therapeutic laser is doing a good cookery course, you're putting all the ingredients in there and sort of stirring it up and hoping that you end up with a really nice cake at the end of it, you know, you're creating an environment there that optimises healing. So sometimes, if you've got a chronic achilles tendinopathy, using shockwave or really deep massage therapy, to go and break up that scarring, and then using laser is a really good combination. Because a good therapist requires quite a lot of, you know, for a deep muscular skeletal requires quite a lot of force, similarly to shockwave in that respect. And this will help in regard a bit of trying to put it back together. So you're not just rescarring where you've just broken down some scarring.

**Steven Bruce**

Debs has sent in an observation, she's been using K laser for the past seven months, amazing results with her chronic pain caseload, which is nice to hear. And I'm sure, I have to say this, I'm sure that other lasers are available. But, what we want to get out of this is how would we decide which is the appropriate one for clinic.

**Stephen Barabas**

We can go to slide number 21, which is just the one after this, I believe. And this is a critical thing. So we've shown the importance of wavelengths, so the wavelengths, hopefully, whatever laser you buy, they're able to penetrate deep enough. And they're able to go and target those key molecules in order to create that optimal environment. So really, it's down to you as a clinician thereafter, you either need a laser that has enough power that you can fit it in in short bite size areas, and we're talking no more than five minutes for a neck treatment or a back treatment on a good laser. But you need enough, if you don't have that, you need a lot more time because in order so that this isn't just some sort of bogus treatment that you're shining at someone, in order to get that clinical effect, you need that combination to work in unison. So this is a given. And then hopefully, you've got enough energy there that you can fit this in with all the good things that clinicians are using already at this point in time.

**Steven Bruce**

So you talked about high intensity laser a little while ago. Does that have the potential to cause damage, if it's such high intensity?

**Stephen Barabas**

If you stayed over a tissue for a long period of time with a high intensity laser, you could potentially raise the temperature to cause damage to the tissues, you know, for instance, our laser in treating someone over dark skin, it recalibrates, so it uses less than 800, in order to make sure that you're not getting too much absorption at the skin level. So there is certain clever aspects that you can try and mitigate to make it as safe as possible. But again, it's down to training and it's down to the education of the clinician using it properly as well.

**Steven Bruce**

Okay. Don't I remember using something about pulsing of this as well?

**Stephen Barabas**

Yep, I'll call that the oil of the good laser. So if you looked at slide 24. What slide 24 shows you is we've talked about wavelength; we've talked about power. And the effect on how long the laser is used for. We're not talking about the wavelength, which is the sort of pulse, this is like you and I annoyingly turning on and off a light switch. Okay, so it's the packets of photons that you're doing at any one point in time. And what this slide shows you is you've got four different cell lines. So you've got smooth muscle, you've got leukocytes, you've got endothelial, which is the new blood vessel growth, and you've got bone cells, so quite different types of cells there. Yes, this is petri dishes. And looking at our laser, if you fired our laser at, with a continuous wavelengths at all these different lines, you can see actually you stimulate a lot of white blood cell growth, which is important if you've got a wound. It's also important, maybe you've just had surgery on your cruciate, and you want to get some white blood cell action to actually clean up

some of the mess inside there. Okay, it's a kind of healing process. It's also good for blood flow. Okay. At lower frequencies, you can see you got much better bone. It's sort of up to 2000 times a second that's turning on and off a second. You get new blood vessel growth and anything over 2000 up to 20,000, you get smooth muscle myocytes skin cells, okay. So in treating a joint, actually, what you want to do is a whole variety of different pulsing. So you can treat all the cell lines at that optimum level. Okay, and that helps in regard to that. So, you know, if I was only doing a wound, I'd probably only start on continuous and do high frequency. Or if I was doing an achilles tendinopathy, mid tendon injury, I'd probably only start with continuous and high frequency. But if I'm doing a joint, which is most of what we're doing, there is soft tissue, there's smooth muscle, there's new blood vessel growth, there's the whole range.

**Steven Bruce**

And in this bottom slide here, which is the bottom part of the slide, which is probably only just visible on the camera, it talks about a variable duty cycle, what is the duty cycle on that?

**Stephen Barabas**

So what you can see on here, you can see on everything, bar the continuous, it's on what we call a 50% duty cycle. So it's on-off, on-off 50% of the time. So if this was eight watts, that's going to average four watts. If that was 20 Watts, it will average 10. If we go to slide 25, it's slightly different, okay. So what you can do with a super intense pulse is you can give a little packet of photons, at an incredibly high power, and peak much higher. And instead of it being 50% duty cycle, it may be on for 30%, off for 70%. The duty cycle is what you're alluding to changes. And that means instead of us just getting hot skin, we can bypass a lot of the scatter in the skin, which is our biggest enemy in regards of using lasers, and get as deep as possible to that tissue without causing superficial heating. Okay, but beware, because I said this is a poorly regulated market. So some lasers say, oh, we can do 100 watts power and you're like, whoo, that sounds really, and you're talking about skin burning? That would make me a little worried. The reality is, they're only on for a billionth of a second. So if you have, say, a 50 watt power laser, and you're only on for a 1,000th of a second, actually, you're only giving point zero joules, 0.05 joules, which is nothing.

**Steven Bruce**

What does it need to be?

**Stephen Barabas**

It would be a class two laser, that would be a class two laser.

**Steven Bruce**

So where would that be for a class four laser to get therapeutic effect?

**Stephen Barabas**

You're up to 10 to 185 joules per centimeter squared. So that's a factor of several 1000. So, you know, with that you could do maybe an acupuncture point, but you're not going to go and treat a hip joint or a neck joint as your client was asking.

**Steven Bruce**

So the big question there is when you're looking at buying a laser is to find out what the power delivered is, rather than....

**Stephen Barabas**

And how long the duty cycle is. The average power, high power doesn't mean much until you know whether it's delivering it per second enough.

**Steven Bruce**

I'm going to quickly ask you some more questions. And we're going across to shine a light on Susie. Lawrence has asked, would this facilitate fracture healing?

**Stephen Barabas**

Yes, there is some really good, we work both on, as I said, the human and the veterinary. And it is used post surgically. Sadly, in the NHS, not as much as I'd like it to. But an example is Guy's and Thomas', where we initially, we were using our laser for all the worst-case hand injuries where that had surgery, that had therapy, that had everything, nothing was working, no drugs were working. And we were using on the worst case, chronic peripheral neuropathies and things like that and really bad scarring of tendopathies and things like that. But now we're using it proactively. And the aim is to go and reduce those end stage problems that are inevitably happening when you're operating on complex things like hands. So yes, if you use it proactively, not only on the bones, but on the tendons, you can have very good success and healing and accelerating that.

**Steven Bruce**

Someone's asked a question, I haven't got their name, but it's a question which I know, came to our minds when we were first looking at Laser. Do we have to make any changes in our treatment rooms to use this kit, you know, shiny floors, no shiny walls?

**Stephen Barabas**

Again, part of the installation processes is to do what's called a risk assessment. Now, a risk assessment is just to make sure your room is laser safe. I've never had a local authority check up on one of my clinics, but I never want them to come back and go, you didn't tell us this, you know. So we actually do it to a very high level. And there are local rules that we have to follow. And we make sure everything's done properly. And therefore when we leave that clinic, if ever a local authority decided to pop their heads in the door, that would have been done to the standard that it's necessary.

**Steven Bruce**

Excuse me, I've got quite a few more questions in here but we need to go and demonstrate this kit. So if we go across and do some stuff with Susie, I'll ask questions while we are doing that as well. Okay, alright, Susie, thank you for coming in and volunteering yourself as a patient again.

**Stephen Barabas**

Thank you, Susie.

**Steven Bruce**

What are we going to do?

**Stephen Barabas**

So I believe today we're going to treat, if we have time, a little bit of Susie's neck, and then also go and do Susie's elbow as well. So we'll show two different aspects about this. First of all, you can see the portability of the laser.

**Steven Bruce**

That's it?

**Stephen Barabas**

That is it, we decided to put it on a silver tray to make it look a bit bigger today. But yeah, that is it.

**Steven Bruce**

You can't have a silver tray because of bouncing laser lights.

**Stephen Barabas**

For the purpose of this this will be alright, because we're not shining it over that. Okay.

**Steven Bruce**

My man in black moment.

**Stephen Barabas**

We're going to give you these which are sort of wraparounds. And it's important that the goggles you're using are specific to the laser, because it should have a CE mark on the side. And that will tell you exactly whether it's specific for the laser that you're using. Okay, every one will be slightly different.

**Steven Bruce**

I'll tell you what, I can't read my questions with his goggles.

**Stephen Barabas**

I'll tell you when we're going to do it. Okay. So the beauty about this is it's calibrated. But if you go to the sort of the the plus, plus version, then you can actually work out and change things accordingly. But for the majority of us, we're quite happy. Just understanding what's wrong with a patient when we're going to treat them and the machine will go and have that pre calibrated. Okay, so if we go into this, you can see it's on programs, I'm going to start with this one, which is the sort of more standard treatments that we would do. And in the case of Susie, we'll go and do the cervical, you can see it's based on three different sizes of individuals, really, that's a child mesomorph, endomorph in regards to body size, and then we're going to go and do a cervical spondylosis. Okay, skin type's really important because I said both the red and the infrared, especially the 800 can be absorbed by melanin, and Susie's quite light skinned, so we can go on a skin type fitzpatrick two. And then in regards to the chronicity, it's sort of a little grumbling pain, we're not going to go to the extreme in regards of it, but we'll do chronic and relatively high levels of pain. And that's pre calibrated there. So you can see we're giving about 2600 jules, it's

averaging eight and peaking at 20. And we're going to do it over a five minute session, we're not going to do the whole session for today. But you can see it's also using all of the wavelengths. And if I go into here, it asked how we're going to deliver that. And that's an important thing, it will recalibrate depending on what head we're going to use. At this point, we're just going to use the standard head. And what you'll notice here, this is a fiber optic. Okay, so I unwind the fiber optic, because the actual laser is being produced internally to the machine itself. Okay. The machine sounds like it's on, but actually, it's not on until I actually release the trigger there. Okay. So in regards of Susie, the machine setting at the moment is set at 150 square centimeters, okay, so when I go and turn this on, I have it as perpendicular to her neck surface. And I will just literally lightly touch her skin. If I was doing a back, I might put a little bit more pressure on there. Because actually, you can almost use the head as a deep massage, which can be quite a nice sensation. But at the moment, I'm just going to gently go over and you can see there's just a standard hand movement there as I'm just going back and forth over the whole of the cervical area.

**Steven Bruce**

What can you feel Susie?

**Susie**

Nothing, actually apart from the wand kind of moving on my neck.

**Stephen Barabas**

Yeah. That's good. I mean, if I stopped there slower, then you can feel a little warmth.

**Susie**

Yes, almost tingly.

**Stephen Barabas**

Indeed, there's a slight tingling sensation. But it's not an unpleasant sensation.

**Susie**

No.

**Steven Bruce**

Is the beeping, just telling us that the laser is active?

**Stephen Barabas**

When I showed you those differences in the pulsing, what that was doing is it's automatically, you know, because obviously, the neck's fairly complex in regards of all the different cell lines in there. And at each of those phases, it's trying to optimize a different cell line. So it will start at continuous, go from low frequency, and then go through those other aspects. And so it will change as it goes through that. Okay. And I don't need to concentrate too much on the machine itself, I can just concentrate that I'm actually targeting the areas and obviously, in a normal scenario where if Susie and I were talking, going back and forth in regards to how she's feeling, or it feels a little bit more there, I'll spend a little bit longer over one area, and it will allow me to go and adapt to what she's telling me as well as what I would like to go and do over the bigger area.

**Steven Bruce**

The big difference between this and ultrasound is for example, I mean, the wands look very similar. With an ultrasound you've got to stay right over the tissue you're trying to work on. Whereas your waving that around quite a lot?

**Stephen Barabas**

You do. I'm working over a sort of wider area. One of the important things we did from our own research was we showed the importance of blood circulation. And I think we forget, especially in the spinal area, how important blood circulation is, in order for the health of those neurocytes and all the other surrounding facet joints and everything. So if I can go on a slightly wider area, I will increase blood flow to all of the soft tissue and the bony structures in that area. So that's important. Yeah. And we did some research on that, looking at that. I can stop it at that point in time, if I wanted to reassess, you know, Susie may want to go and flex and move and the machine doesn't really change, it will just start exactly where I left off. And I can just restart, and it will just continue going on. So, you know, it's very rarely that someone feels uncomfortable. The few times I've had that is people who've got really nasty fibromyalgia. And in which case, I might slightly downregulate the first treatments, just to allow them with their sort of aberrant sensation to be able to tolerate it. Because sometimes, in those rare scenarios, it is a little bit more intense.

**Steven Bruce**

You might have to go over something again, because there's a couple of people have sent in questions about safety here. Mandy and someone called Horse Collector, I'll go into why they get these funny names, saying that they thought class four lasers were more for surgical purposes. And manual therapists were better off using 3B or low intensity.

**Stephen Barabas**

That was the case in the 1980s and 1990s. But you know, class four lasers now are well established in the therapeutic, both in Europe and in North America, and now in Asia as well.

**Steven Bruce**

So is there any rule for 3B lasers anymore?

**Stephen Barabas**

I think if you have a lot of time on your hands or you're really only treating acupuncture, then class 3Bs have a good part to play. And, you know, if you're able to hold it over one area for a long period of time, then that's fine as well. Most of us though, you know, when you're treating a patient, yes, they've got a point emanating from maybe their spine, or they may be coming in with an achilles tendinopathy. But you'll more often find that it's actually related to some other parts of the body and an imbalance. And therefore you are often treating more than one location during that timeframe.

**Steven Bruce**

We had a couple of people, Terence and Daisy, asking about fractures again. Terence was talking about stress fractures, Daisy about shoulder fractures. You already said that it's good for treating fractures to

helping the healing process. How specific you have to be with that, do you have to be right over the fracture site, or?

**Stephen Barabas**

You'd be doing it right over the fracture site. But interestingly, whether they've got cerclage wire or lag screws or metal, you can actually treat with it. So unlike shockwave, where you would be contraindicated, you can use it on there. If there is a big plate, you just do it from the counter side because you will get reflection back off that plate and you don't want to go and do it on the tibia or on their femur, where you might just get reflections straight back to the skin. So you do it from around the sides of the actual thing. But if you have cerclage wire or lag screws, not a problem at all, if it was like in a biceps or achilles.

**Steven Bruce**

Chandra has asked about whether you can use it on peripheral neuropathy in for example, in diabetics, and is it effective?

**Stephen Barabas**

Yeah, we have a number of studies where we've gone and shown the benefits in regard to diabetic ulcers, as well as neuropathies. And there is a study we did on 70 women with peripheral neuropathy, their lower legs. Unfortunately, it was induced by cancer treatments that causes the neurological damage. But in doing that, it was a cross over double-blind study, and it had a very good success rate. Okay. I'll stop this now, is that's okay, Susie?

**Susie**

Yeah, that's fine.

**Stephen Barabas**

So I'm going to stop this and push this back, you can see we've almost finished the whole treatment there. And it was going through the phases, I'm just going to show you one other aspect about this machine. So if Steven Bruce went in there and alluded to the fact that there's some new technology here. So on this head here, not only does it deliver the energy, but it also detects it coming back. And that's important because we never want to overtreat an area. And the feedback photons allows some modulation in the amount of photons we're delivering at any one point in time. There is something also on this machine that goes and takes it to a new level. So I showed you that side on the left hand side. On the right hand side here, what you've got, it looks for all sense and purposes the same, we started the same. And if we were doing say the cervical again, and we can go down and treat the spondylosis. And we treat the type two skin. And we do the same level there. Now I'd ask you how big an area, before it was calibrated at 150 square centimeters. Now we're doing a bigger area now and we can choose a bigger area or a smaller area depending on the symptoms that Susie was showing. So if I slightly changed that, we could click on the four there and we can increase that maybe by another 10 centimeters. And then going and clicking on there. You got this sort of darts board effect there which, again, looks different. Not all of us are laser physicists like myself in this. I've had to learn a lot in the last decade. Most of us understand that terminology of anti inflammatory, about deep perfusion, about analgesia and you can change all of this as and when you feel as a clinician, which is important. So you're much more in control of terminology that we understand in the medical or manual therapy area. But again, it allows you that



capabilities. And so when I do this, it shows you the same heads, and you can do it remotely or directly as we're doing now. And it will go through this process, and that will give you a different sensation, this machine actually goes up to 30 watts. So some of your people asking, were asking about, you know, the power levels. Well, you know, in this case, we are now able to go up to 30 Watts, which is delivering a lot of energy. But what I've learned in the last decade of using laser therapy is actually the limits of what we thought was capable of being pushed further and further. Sometimes you need to use less energy, which is calibrated into the machine. But other times, especially on chronic pain and deep, musculoskeletal spinal injuries, more energy can be more beneficial.

**Steven Bruce**

We've had a couple of questions about what else it can do. Simon has asked whether it can be used to treat cardiomyopathy. But also, I believe, I saw something about it being used for respiratory problems as well.

**Stephen Barabas**

Yeah. And, I don't think we are at that point in time. I don't know of any study globally, where they're looking at, could you after damage, it can definitely penetrate down to the heart. But I don't know of any study there that's actively looking at improvements in the heart, both neurologically and muscular. In regards of your other thing, absolutely. You can see, interestingly, that was a shorter treatment time now, when we did that, because we were using quite a lot more power. That was okay, yeah?

**Susie**

Yeah, it felt warmer.

**Steven Bruce**

Stephen, we got four minutes left.

**Stephen Barabas**

No problem.

**Steven Bruce**

So we're sort of approaching the end already, as always, with these short shows, we try to pack a lot in. Can I ask you some quick fire questions?

**Stephen Barabas**

Go for it.

**Steven Bruce**

Yes, no type answers?

**Stephen Barabas**

You asked about, sorry, the lungs?

**Steven Bruce**

Yes.

**Stephen Barabas**

And yes, during COVID, we were doing research based in Asia and in North America. And it came off the back of work that we were actually doing in the dog, because the dog, westies get chronic pulmonary interstitial fibrosis as a genetic problem. So we already got working with the University of Minnesota, we've done a lot of work with them. And therefore, we already had the technology and some of the protocols. So we put that into place. And actually, in Malaysia, and in other European countries, they were using this technology for COVID patients as an acute respiratory pulmonary fibrosis problem.

**Steven Bruce**

Okay, so with good success?

**Stephen Barabas**

They've got published papers after that.

**Steven Bruce**

Fantastic, yeah. I'm not sure, are you aware of any manual therapist using it for that purpose in their clinics?

**Stephen Barabas**

There are. Yeah, the person I refer to most actually, is a chiropractor in North America, Dr. Hall, he's probably treated 500 patients or managed, so he managed 500 patients with chronic pulmonary fibrosis, and they come from all over the country to go and have his treatments. Compliance, we haven't spoken about is important. So like a drug, you need to be compliant. And therefore we talk about people coming at least twice a week, you can come more frequently if you've got an acute injury, but twice a week for at least three weeks to go and see some biological effects taking effect during that timeframe. And then you might go on a maintenance dose.

**Steven Bruce**

Some other conditions, so how about, can it be used in conjunction with shockwave?

**Stephen Barabas**

Absolutely. We actually sell a shockwave. So I actually think shockwave is a very good tool. But it is a little bit more of a blunt tool than a good laser therapy.

**Steven Bruce**

Sorry to interrupt. I'm trying to rush of course, we had somebody who's very, very familiar with lasers, and I don't know whether it's your laser or another, but we were talking about getting shockwave in my clinic. And her advice to us was, well, if you're going to get laser don't bother with shockwave because this will do pretty much what shockwave does.

**Stephen Barabas**

Okay, you got one word answers on these. Can you treat that way in the hands?

**Stephen Barabas**

It depends on which level you're at, you know, if I was doing out and out sports medicine, and I was seeing a lot of chronic tendinopathies, then a shockwave and a laser, a good laser is a great combination therapy because as I said, shockwave does a better job of breaking up the scar tissue. But if you're a great manual therapist, you may be able to do that manually without having to use shockwave. Laser's better at putting it all together and not rescarring, because one of the things the study shows is you create a lot more type one collagen with laser, and less scarring type three, so you don't rescar where you've just broken up scarring, which is important.

**Stephen Barabas**

Yes.

**Steven Bruce**

You got one-word answers, I'm afraid because we ran out of time. So what about degenerative disc disease?

**Stephen Barabas**

Yes, sort of.

**Steven Bruce**

Can we take our glasses off now? I've not got some more questions on my list here. I'm really sorry that I've had to rush through this last bit. But as always, you know, we get really soaked up in the discussion and we've just run out of time for everything. I will send out the slide deck for you. So you'll have, perhaps not all of the 81 slides but I'll give you a PDF handout of all the things that Stephen would have liked to have discussed. If you want any more information, then contact me and I'll make sure you have Stephen's direct contact details as well, as long as he's prepared to share them of course. But that's all we've got time for this lunchtime which is astonishing. It's gone so quickly.