Academy of PHYSICAL MEDICINE

Transcript

The Latest Developments in Laser Therapy With K-Laser

Cast List

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APM: I've got two guests. I have Stephen Barabas and I have Andy Goddard. Both doctors. That's going to annoy the osteopaths in a minute. Both doctors, both been qualified now for over 20 years. Stephen Barabas is a veterinary surgeon. He's worked largely with animals over most of that career, but he's also the laser consultant to Guy's and Thomas' hospitals. Dr Andy Goddard is a chiropractor. I said I was going to annoy the osteopaths for a bit there. I welcome them both to the studio this evening. It's going to be great. I'm sure you'll have a lot to tell us, not only about the science of what's going on, but also how you use it in the clinic and the results that you can see from it in the clinic.

Let's start with you, Stephen. How on earth do you get from being a vet to dealing with lasers for humans? Because you're still a practicing vet, aren't you?

SB: I still practice, yeah. I practice in Luton. I got into lasers really for an offshoot having lived in America for a while, and inevitably, a lot of medical science that we see gets adopted, even though it may be created in Europe, it gets adopted first over in America. From a medical and a veterinary perspective, there were a lot of clinics that I was seeing that were using it on a day-to-day basis in general practice, but also on a higher level in hospitals. When I came back to the UK, I thought it was something that would be useful within the veterinary sphere initially. But when you see an osteoarthritic Labrador which starts to walk better, it gave me a lot more confidence and then going into the human sector.

My background actually, my grandfather was the head of the Royal College of Surgeons, and my brothers, uncles, aunts, everyone are doctors. I was the black sheep being a veterinarian. It felt comfortable, actually, and quite easy going into the medical sphere after that.

APM: Something I didn't tell you, actually, is that one of the things that we do in the academy is periodically we run animal dissections. Of course, there's not too much resistance, but you do have to do a little bit of convincing to get people to think it's worth going through an animal dissection when actually you treat humans. The great thing is that the AMP is very, very similar to human anatomy and physiology, and of course you can do a lot more with an animal than you can with a dead person because there are so many legal constraints on what goes on. But it also means, of course, that as a vet, your anatomy and physiology is pretty shit hot. We're going to test you later.

SB: It's not bad. It's not bad, but there is quite a big movement ... I sat on the British Vet Association Council and there's quite a big movement to go back to what happened in the 18th century or the 19th century of one health, where you did look at the link between animals and humans and use the animal as a model. I work a lot, actually, with the laser actually with Noel Fitzpatrick. Some people may know him as Super Vet. He uses a lot of laser therapy for the rehabilitation and pain management, for all the good surgery he's doing, he still needs that time and the people behind it to actually make sure those animals get to the optimum where the clients were looking for.

APM: Like I say, we've got quite a good relationship with various vets because of the dissections. In fact, we ran a dissection down near Heathrow once where ... I think they were dissecting a greyhound. Very often it's greyhounds, but in the middle of this dissection, a chihuahua was brought in for a c-section, and the vet there had all of the people attending the dissection helping with holding the pups and

doing whatever you do with them after they've been lifted out and so on. It turned into quite an exciting little outing for them.

We want to talk about lasers, though. They've been around for a long time. I've interviewed Professor Tim Watson from the University of Hertfordshire. When I interviewed him, and this would have been a couple of years ago now, I remember him stating that all the evidence said lasers are great, but they don't penetrate, so they're only good for surface stuff. What's new? Has something changed?

SB: Absolutely, there's been ... The great thing about medical science is that things move forward. Because people have to pay for the equipment and then people actually have to use it and see the results out of it, things tend to progress progressively forward in a good way in the medical equipment area. With laser technology, we actually have known about it since the 1960s. There was a guy called Endre Mester, who was in Budapest Medical School, who was trying to kill cancer in mice and found out that his laser beams were actually healing the placebo group quicker than he was expecting. Then that was there this photo bio-stimulation, this using light to heal tissues, came about. It actually dates all the way back to the 1960s.

Then since then there's been better and better progression of equipment, and there's been more and more powerful lasers being used to go and allow it to work more efficiently in clinics.

APM: Has something changed in the last couple of years though, because Tim was talking to us then about the quality of evidence only a couple of years ago, and saying, well, it's purely for surface injuries, nothing ...

SB: Yeah, and there's still a big school that believes that is really about superficial and acupuncture points and nothing much deeper than that. But actually, there's been a lot of more good research. A lot of it actually happening in Russia and a lot of it in the Eastern Block areas, but the research and the ability to be able to accurately determine what a wavelength does, how deep it goes, which wavelengths target which tissues and different cell structures, has allowed us to be able to more accurately and efficiently use lasers to penetrate even down to hip and facet joints and really deep structures, which we wouldn't have been able to do in a short timeframe.

APM: Right.

Are we're talking about different lasers to the ones that people have been typically using in clinic up until recently?

SB: Yeah, there's a slide I could show you which would give you a little bit of an inclination about this. People talk about hot or cold lasers, and really that's not a very good definition. There is ... We have to go to America for this, and there's an American national standards indexes that they use, and they define four different classes of lasers. The initial lasers were very weak, and that's like-

APM: Which is what we've got on this slide here, isn't it?

SB: Yeah, this slide shows that when you are down in class one, class two lasers, they're weak lasers and although the wavelengths may penetrate deep enough, the power at depth isn't enough to create a biological change. But as you go higher and higher in the thing-

APM: Can we just get that slide up on the screen? Because I think it's useful just to see the different classifications. Yeah, it's up there now.

SB: Absolutely.

To be able to go ... By about the 1980s there was class 3B lasers. Class 3B lasers, actually, are very efficient with the right wavelengths at penetrating deep enough. The problem is the timeframe it takes. They're very accurate at being able to go and stimulate tissues, but in order to go and get enough energy at depth for something like a back joint or a hip joint, it takes a little bit too long for most practitioners, especially chiropractors and osteopaths, where time is important and also it's got to fit in with all the other manipulations and all the other techniques that they need to do within that clinic.

Class four lasers have allowed us now to be able to fit in within busy clinics and multi-disciplinary clinics a laser that allows you to do in within a short timeframe, but actually using the right wavelengths, penetrate deep enough to be able to have a biological effect, both superficially and deep now.

APM: How long have they been around in clinical use?

SB: I think it's about 2002 is the earliest FDA and EU certification for class four as a therapy. They've been there before for surgical lasers, but in the regards of safety, they only allowed them about 2002, and gradually the technology's progressed as well and improved since then.

APM: The evidence behind this, how much of this is stuff that we ought to be skeptical about as being generated by the laser industry? Sometimes that's the only place that you're going to get evidence, I know.

SB: The majority of core science is done by non-commercial organizations. That's great, because any decent medical equipment company will use these results. If I show you a slide a little bit further forward here, sorry. Most lasers, and this slide will help people understand, target things called chromophores. It's the specific wavelengths that target chromophores.

APM: Tell us about chromophores. That's a light-receptive-

SB: Exactly. In the world, we know about green plants and chlorophyll absorbing sunlight creates the sugars that creates all the green plants and all the biosynthesis that we know within the world. That's sunlight energy that's doing that. In the case of our bodies, we know melanin. Obviously if you have sunlight hitting your skin, it creates more melanin and you go darker. It's a protective mechanism in your skin to prevent UV light damaging your skin.

There are other chromophores in your body, and these are the ones that we're really targeting that allows us to biologically improve the efficiency of our bodies. If you look on the slide here, which your members should be able to see now, there are four molecules that a good therapy laser should be targeting. In the skin, a red light can go and target melanin, and that's great, but it doesn't need to be powerful. Because a powerful laser would actually burn the skin. It's enough to go and heal wounds and scars, and accelerate that process, and also reduce a little bit of the inflammation maybe, post-surgically or through damage. But the other three molecules there, the cytochrome C, hemoglobin, and water. They are targeted by infrared wavelengths and different infrared wavelengths, and they can penetrate quite deep into the body. Cytochrome C eventually would go all the way ... If I used one of the 800 wavelengths that targets that, it would go through you eventually, all the way through. So they can go quite deep. But in targeting those-

APM: Right, but without damage.

SB: Without damage, without damage. But in doing that, we can go and improve the efficiency of cell metabolism. We can improve the oxygenation, even in an area that you may not be using. You've got epicondylitis and you're not using your elbow, actually you can improve the profusion to that area and the oxygenation to it, and the water actually is the main medium that we use for blood. Therefore, in targeting that, we can actually open capillary beds in areas that the patient may not be actively perfusing as well as they could be.

APM: Okay.

Look, I'm just going to digress. Can I ... Do you mind if I digress for a second?

I've had a comment sent in by Sarah, who is sitting in London with a small gin, it tells me. I presume it's a small gin.

SB: Lucky her.

APM: It could be a small girl. Her comment is, "Urogenital Manipulation." Now she's asked you that because right behind your head on that shelf there is a book called Urogenital Manipulation. Sarah, no. It wasn't the only book that was available in clinic, but I'm going to make a bit of a reveal here. We're actually in a studio and they're just window dressing. They are real books, but it just happens to be on the shelf and I didn't have one on lasers to put behind us. Well, I did, actually. I had one on lasers, but it's about sailing, and that's probably the wrong-

SB: I apologize. I should have brought my books.

APM: Yeah, but isn't it great that people are spotting the books on the shelf behind you at least. They're paying attention. Thank you, Sarah, for that.

So, where have we got to?

SB: Yes, there are chromophores which we target with specific wavelengths, and they tend to be in the infrared. That penetrated deeper into the body tissue, and what-

APM: We've been using infrared lamps in clinic, physios particularly, for a very long time, haven't we? Are we just saying that's too diffuse and actually what we want is something much more concentrated for a ...?

SB: One of the problems, coming from a medical background is the lack of regulation. The word 'laser' gets used very freely. So an LED, which is often in the heads of some of these lasers actually are like normal light and they don't have the same penetrative ability as a true laser. True laser's got specific properties that allows it to penetrate deeper into the tissue and have less interaction between beams, and therefore you don't get the shadows that you get with a normal light. Then an LED doesn't have quite the same degree of penetrative ability that a normal laser would do.

APM: I do remember Tim Watson saying to us back in whenever it was that we interviewed him, that if you go onto the internet and look for these things, some people can be suckered in by various devices

purporting to be healthcare devices which are nothing more than red lights. Whether they're infrared is another matter. If you can see them they're obviously not entirely infrared, but...

SB: I'm not into huge amounts of regulation, but I do think one of the benefits of things like NICE in regards of drugs is you know it's not only safe, but you know it's efficacious, what you're taking within this country. In medical equipment, the only thing you need to prove is safety. You don't need to prove efficacy, and therefore this does cause quite a huge chasm in regards of what actually is fit for purpose and what isn't fit for purpose. That's confusing, not just for the clinician, it's confusing for the end consumer, because they target everything as, "Oh, I've had laser, it doesn't work." Well, actually that's not quite true. There's a myriad of what actually will work and is fit for purpose and what isn't.

APM: Who regulates the safety of devices like this in this country? You mentioned the FDA.

SB: The MHRA-

APM: The MHRA does devices as well as drugs?

SB: ... does devices, yeah. They're the main things. Then there's CE marking, and that's done within the EU. Then there's FDA over in North America, but they only concentrate on safety. That's the only criteria they have to fulfill to get a license.

APM: If NICE say it works, you'd like to think that they've got some background for that, some evidence.

SB: Interestingly, NICE at the moment does back therapy lasers, but only for very specific areas. It doesn't broad scan them across the whole area.

APM: Which of course means that's the only areas they've actually done some research in, doesn't it?

SB: Well, it's what they as a group and a body have decided is enough RCT double blind studies to convince them that for that purpose it is useful. Yeah.

APM: Andy, what got you into this? How come you've started using ... I don't know how long you've been using laser for, but ...

AG: Yeah, I was full-time in practice and very, very busy. It was four years ago where I'd just run the line for my son playing football and I bent down to pick a football up underneath the hedge and felt a nice little

pain in my lower back. Bearing in mind it was about 10 minutes to get home, it took me about 25 minutes to get home. I had to keep stopping the car. Prior to that, as probably a lot of therapists will have, we get joint problems, and I'd had lower back problems and some sciatica over different stages over the years.

I went to work, or I went to get up to go to work the following morning, and I was absolutely stuck and I couldn't move at all. I had a week off of work, and then went to see my GP, to which she arranged an MRI and that confirmed lumbar disk lesions of L4 and L5. Going actually into the midline as well, so potential for cord... I gradually got back to work until June of that year, and I then couldn't work any longer, and I had four and a half months off of actually being in practice. After seeing an orthopedic consultant, who I very much trusted, he didn't want to operate. He said that injections weren't really a good option, and just let mother nature take its course, see where things settle and get back to work.

Eventually I got back on a fade return, and doing lots of rehab, lots of nutrition, various bits and pieces, I went down to my training college where they were running a dynamic neurostabilization course. Met up with actually a friend of mine who-

APM: You trained at the Anglo-European College in Bournemouth, didn't you?

AG: Down in Bournemouth, yeah. That's where the course was being held. I went down there for me to learn the DNS really to incorporate that into some of my own rehab and met up with a friend of mine who is a chiropractor in Nottingham, Brian. He actually said had I looked at and considered a K-laser. I have to say, I knew nothing about them before that. Probably when you've been around in practice for a while, you see so many things come and go, and my initial reaction was just, all right okay. Something else.

Being really quick off the mark, I went home and did nothing about it for several months. Brian actually came up to see me, brought the K-laser with him. We had the discussion and he asked whether I wanted to get in touch with Steven. At that point, I still said no. It took me probably about six months of going through the research to see what laser therapy was, whether it would be beneficial, how it worked and you've just been talking that there is so much research out there on so many machines and so many lasers that really didn't stack up to me, but the K-laser was the only one that stacked up in terms of the research, and in terms of the way that they go about it.

Eventually I brought Steven in and we trialed it for three weeks.

APM: Now, just let's get this clear for everybody, K-laser is not a type of laser, it's a company that produces therapeutic lasers, is that correct?

SB: No, it's a specific laser produced by a company. The actual laser itself is produced in Italy. The owner is the closest I've ever met to a Steve Jobs in my life. He is a little bit crazy, but he is crazy in a good way because he is utterly committed and passionate to going and improving human quality of health. He has devoted his life to going and producing the best quality, most efficacious equipment that he can. He is ... That's what he's spent his life doing.

APM: Right. Cards on the table, you work for the company that distributes retail sells K-laser.

SB: I did. I spent probably about four, five years researching, because I'd seen what was happening in the USA. I did a lot to background research and development and things. I couldn't create one myself, I didn't have that technological knowledge, but I knew scientifically what I was confident in standing in front of someone and actually going away from what my core background was, which was obviously veterinary medicine.

I, after many, many different courses and many different situations and looking at clinical papers, I actually chose to distribute the K-laser. That was my own decision, and since the it's grown, both on human and on the veterinary side.

APM: Yeah, okay.

We're not here obviously to do a sales pitch for any particular company.

SB: Understood, understood.

APM: But we are here to explore the capabilities of use. What can we do with it?

SB: Understood.

It does depend on the laser. Whatever laser you are going to purchase, you do need to understand there are three things that will alter whether it's just skin-deep, whether it's going to be pain management, whether it's going to be deep musculoskeletal, the timeframes, all that.

The three things which are critical is wavelengths, the power, and also the pulsing. That means the on-off of the laser itself, from continuous to maybe 20,000 times a second. Those three perimeters means that

you can really change from doing carpal tunnel and relatively superficial to something as deep as a facet joint with all the inflammatory osteoarthritic changes that might be happening around that structure. It's important that the person buying it understands what's happened. Also, it's important that they do the research, like Andy did, in regards in where we ended up meeting, but they need to do the research on that individual laser, because there is such variabilities and they need to make sure that that individual laser has double blind placebo studies to back what they're trying to claim it does rather than extrapolation.

APM: Okay.

When you say look into these individual lasers, are you suggesting that you need one laser for wound healing and a different laser for antiinflammatory, and a different laser for pain relief? Or could one laser do all those things?

SB: You can have one that does all those things, but it has to have the capability to do it. You rightly said that Tim Watson's a very knowledgeable person, and initially there was not the ability to have the right combination of wavelengths, power, and frequency to penetrate deep enough. Therefore the majority of the lasers were very good at treating acupuncture points and having the global effect that they had after that, but not so good at the true bio-stimulation effect which most dermal lasers could do but we're trying to do at depth for muscular tears, tendons, deep bone structures.

APM: How is it actually ... What's the physical effect of this? What's it doing under the skin?

SB: The word I like to use is called photo bio-stimulation. It's using photons of light to bio-stimulate what your body is doing very well, except when it starts to get injuries or osteoarthritis or nerve damage and other things like that. Therefore, what a good laser should be able to do is replicate what your body does, but just do it a little bit more efficiently.

As you know, if you have pain, you tend not to use that joint. It restricts you in your movement. Or if you do your achilles or whatever other part of your body. Therefore, what this does is it allows better perfusion, it allows better oxygenation, and it increases cell metabolism. All those three things are good, and it's what the body should be doing, it's just through restricted movement or pain that you're not using that joint to the level that you were prior to it.

APM: Are you able to target the effect at a specific depth, or is it going to have an effect at every bit of tissue that the laser passes?

SB: It will stimulate every single tissue on the way through, so inevitably there will be more stimulation at the top than there would at the bottom. So the higher the power of the laser, the more efficiently time-wise you can penetrate depth. If you had a weaker laser, all you do is just wait longer. The wavelengths will penetrate that depth, but they won't produce enough energy at depth to be able to have the same concentration that creates a biological change.

APM: Okay.

In some ways, that does sound very similar to ultrasound therapy in that you alter the power and the time that you're on target to get penetration to a certain depth.

SB: Yeah.

Ultrasound has some good research. It uses shock waves and by its very nature, it's not targeting ... It's trying to provoke a reaction. If you have a nasty scar on your tendon, the actual physicality of ultrasound breaks that scar tissue, and in doing that, it will then, hopefully, get your body then to start mending properly, but it does require all the rehab and all the expertise of chiropractors, osteos, physios in order to make sure that you don't just re-scar that area, you actually have the proper program afterwards to build it.

A laser works slightly different. A laser's targeting actual molecules which are fundamental to good metabolism within your body and good perfusion, and in doing that, it's a bit more of a Delia Smith of cooking world where you're putting all of the ingredients in there together and hopefully concocting that so that actually you create the perfect environment for good healthy regeneration and lack of scar to happen in the healing process.

APM: You mentioned four molecules that it's targeting. One of which was water and I can't remember what the other ones were.

SB: Hemoglobin.

APM: Hemoglobin, of course, yeah.

SB: Cytochrome C, and melanin in the skin.

APM: Okay.

Well, let's start with water. Is it just going to boil the water?

SB: No, the water in the infrared is a color, therefore that color in the body system absorbs especially around 970 to 1,000 nanometers. That's the target, and so we're targeting that, and in doing that we create little thermocouples, and little changes in temperature, which are enough to open capillary beds. That thermodynamics that you create in it is first of all a photo-chemical, but it releases the energy thereafter as heat. That heat change allows you to open capillary beds and improve perfusion to whatever tissue you're trying to target.

APM: All right.

Then let's go to hemoglobin.

SB: The hemoglobin, the iron in hemoglobin is very absorbent to a spectrum of infrared from about 700 all the way through to 1,000 nanometers. In targeting that, like a pH change, the iron will absorb the photon of energy and that energy will change the structure of hemoglobin. Therefore in doing that, it actually dumps oxygen in the surrounding tissues. The Russians have done some fantastic work on this, but they've accurately been able to measure the changes in oxygen partition that has been released in that area and show which wavelengths have done what areas and which are optimizing that.

APM: This means that your 900 nanometer beam which is stimulating the oxygen is also going to affect the hemoglobin?

SB: There will be some overlap. It's not a discrete this does that, that does that. There is a little overlap in regards I all that. There's optimization, but yes.

APM: How do you decide which frequency you want? How do you tell it which one of those things you want it to do? They all sound good to me.

SB: Around the 904, 905, that's peak absorption of iron and hemoglobin. Around the 800s, that's peak absorption of cytochrome C for cell metabolism, and so you can increase that. Around the 980s to 1,000 nanometers, that's peak absorption of water. If you really want to optimize the laser then you can use one. But if you are trying to have a relatively cheap laser, you can just have one or two wavelengths. That's possible as well.

APM: Both being in use at the same time?

SB: Both in the same time.

APM: Okay.

I got a couple questions about specific lasers that have come in, if I may.

SB: Yeah.

APM: This one's from Mark, who says he's a practicing chiropractor and have a four laser in his clinic, which he's used for a few years, generally with good results. He's dealing with a chronic subacromial bursitis, which has been diagnosed by an ultrasound scan that was done at the Bournemouth College. It's not responding as fast as he would like, and he'd be interested in knowing the treatment protocols that you would use for that condition with the type of laser that he's got ... Or sorry, with the type of laser that you use.

SB: Understood.

James Carol is one of the forefounders of laser therapy. He set up THOR Company, and it's a British company. The majority of ... All of his lasers are class 3B. Therefore the power levels are less and therefore you need to either hold them there for longer of you have thousands of small ... and they tend to be LEDs and not lasers, that they end up putting on the tissue structure. It's a compromise in regards of how you're going to do it. Either he has to spend longer with the laser over the area that he's trying to treat, or potentially ... With the THOR laser, they have a little pen, and that's the only one which is a true laser, the rest of them tend to be LED heads with a couple of laser beams within it, so it's a time factor.

APM: I don't know which sort that Mark is using. He hasn't said that. He just say it's a laser.

SB: They tend to come with a range of different heads.

APM: Oh, okay. I see.

SB: Some LEDs, some with a laser. Therefore, it's a time factor. The longer you actually take on it, the more efficient you will be at actually treating some of those deeper tissues.

APM: Essentially what we're saying-

SB: But will you have any-

APM: Of course, yeah. Go on.

SB: ... comments in regard to that.

AG: I think also, clinically, you've got the distal pain fibers, but you've also got the more central spinal nerve root pain fibers. Sometimes with the more chronic longer-term conditions, then it's worthwhile actually working on, obviously, the area of concern, but also central aspects where the actual spinal nerve roots are as well. That sometimes makes a difference in terms of desensitization.

For the nerves.

APM: Right. So it's not fixing the problem, it's taking away some of the pain for the patient.

AG: Yes. In that aspect it probably would be. But obviously if you're reducing the pain, then you can get better movement with the shoulder and then it sometimes has the knock on effect, that you can start to get the movement back.

APM: What's the laser actually doing for a bursitis?

SB: Ironically, the errors of inflammation ... About the use of lasers for inflammation is probably the errors that's least well researched. I think the majority of good lasers are improving profusion and metabolism and that then has the secondary effect of reducing inflammation. So when you're using it on something like a bursitis or an acute inflammatory aspect, you're trying to improve and stabilize that structure, improve the profusion, but also get rid of some of the inflammatories that are present in there.

Not so much on the bursitis, but on an arthritic joint, I think one of the big benefits is once you start going and improving the profusion to that joint, a lot of the inflammatories, which are creating the pain enhancement of the pain receptors, the IO1s and two necrosis factors, if you can improve the profusion, you're going to dissipate a lot of those inflammatories, and therefore the sensitization of the pain fibers is less.

Therefore you have a less restricted movement in regards to that. In regards of what Andy was talking about, there is the secondary effect of a good laser, which is not just a local effect, where someone has had really bad chronic pain in a condition whatever the condition is. You then get these maladaptive pain syndromes, where you've actually gone and affected the central nerve perception as well, and there's been changes in the dendritic interactions.

Therefore treating just the local joints alone is not sufficient for some of these really chronic problems, which a lot of chiropractors and osteopaths get that as almost a secondary or tertiary referral. When you have that scenario, just doing the local thing is not enough, you

need to treat the correct central nerves to try and ... I can only say readjust, but there's some really good research on showing the effect and changes on dendric interactions.

You'll get sprouting and changes in the nerve roots if you treat that central lumber sacral or cervical nerve roots, which are supplying the appropriate appendage.

APM: I had an interesting response to one of the emails I sent out about this particular broadcast. I sent out several thousand, as you know, to people who have expressed an interest, GDPR and what we do. I've seen it, we've got SB coming in, we're going to talk about lasers. The message I got back was very terse. I know the guy's not watching, because he's not a member, but he just said "No, not for me, it's not osteopathy."

I just thought, okay, it's not necessarily something which was taught during my training as an osteopath and what goes on at the AECC. But of course, actually, I wasn't being completely factious in saying it's just concentrated sunlight, because it is concentrated light, isn't it? Actually, from what you've said, it is doing something to affect tissue healing, which would be very hard to achieve with our hands.

SB: And drugs.

APM: Yes.

SB: And drugs. The majority of drugs you're dealing in pain management are blankets. They're local anesthetics, they're steroids that are just trying to blanket out the pain. They're not actually fundamentally.

APM: That's very sever side effects.

SB: Understood. They're not trying to fundamentally go and improve the underlying core problem there, whether it's a local or a central nervous system, where a laser has the capability, which is why it's such a great tool with chiropractors, osteos, physios, or manual therapists.

There's only so much you can do through manipulations of your hands or good exercise centric to the aspects. This really does add something. What I enjoy from ... That's obviously the general vet is a very omnicompetent sort of person, where you're doing everything that comes through the door. What I like about working with chiros and physios and osteos, is they look more omnicompetent on the person.

When you see an achilles problem, they don't just look at the achilles. They look at the whole structure of how the person's standing. They look at all other aspects of that individual, rather than just concentrating on the achilles tendon. The laser is similar to that. If you just focus on just where the damage is, you're only seeing part of the whole problem. You really need to look at the whole. Why has that happened? What that structure needs.

That's why I find it very compatible, that's why I enjoy working with chiros and osteos, because of that philosophy.

APM: There will be, I'm sure, a body within chiropractic and osteopathy who say, as you implied earlier on, your own interview, that's just another gimmick and a pass. You've obviously found that's not the case in your own clinic. Is that the common objection you find, Stephen? Stephen? That one's for you.

SB: You were looking ...

APM: You're a man who talks to more people about this sort of equipment, is that a common objection, they think it's just a gimmick?

SB: I find that interesting, when I've been to BCA meetings, when I've gone to the institute of osteopathy and to the physiotherapy fests and all those sort of things, the older generation goes my hands, that's all I need. My hands and my brain, that's all I want. I find the younger generation is more accepting and more willing to take on new concepts, and to add that into an existing good training and a good philosophy in regards of how to approach the person. In taking on things like ultrasound, like you said, and laser therapy, there is a little bit of a generation thing.

Not to put a dispersion on that.

APM: I'm always fond of pointing out that actually no one could possible be sure that the founder of osteopathy, Andrew Taylor Still, would not have used laser had he had the opportunity, but he didn't.

SB: Understood.

APM: There is a well known tenet of osteopathy, probably similar in chiropractics, the rule of the artery is supreme. Whenever you've talked an awful lot about blood profusion, stimulating circulation, improving oxygen distribution and all that sort of stuff. All of which sounds as though it's in keeping with what we're trying to do to the body.

I have a personal view that we're not here simply to adhere to the original principles of our founders, we're here to make patients better. If there is a role in anything that comes across our radar, then perhaps we should be looking at it.

You talked about your own problem with your lumbar disks. If someone came to your clinic complaining of a very similar problem, say there's a low back pain, they can't move. You're thinking, well, this might be disky, it might not. You've done your tests. You're clinical tests are inconclusive. Would you use laser on them without further referral and say we'll see how this works? Would you only use laser if you see what's going on in an MRI?

AG: We would make the recommendations based on what was right. If a referral was right or necessary, then that would be recommended, irrespective of whether the laser was there or not.

APM: Presumably there are plenty of occasions when you're own clinical diagnosis has given you a provisional diagnosis. You think these are the tissues I want to treat. So I'm going to go straight ahead with laser.

AG: Yeah. We've found that with certain things, where there's a lot of pain, some of this I have to say has been over the last two years, I won't say trial and error, but it's trying to figure things out in terms of where you want to fit things in and how you do. Sometimes we'll use it as a stand alone therapy. More often than not, we'll use it in conjunction with our standard package of care.

There isn't really a right or a wrong that you can bring the laser into play at any stage. Sometimes, it's actually beneficial to start off with the laser instead of the actual hands on work, not always, but occasionally. To actually settle things down, so that you can then start to do the hands on and the manual therapy work. The two can very, very much interchange. Absolutely spot on.

APM: How long has it taken you to get to a stage where you could make that clinical distinction? Laser first, hands on first, both together?

AG: I would have had the laser for a year. This was just purely my decision. But we'd had the laser for a year. We did no marketing on the website or in any way, shape or form. Just by-

APM: You sound like an osteopath.

AG: Just by making the clinical decisions at the time, then saying to people "We've got this technology. This is what we're familiar with. This is how we've used it. These are the results that we're aware of. Are you

happy? Do we give it a go? Are you happy to try it?" A lot of those trials done in the early stages, when Stephen brought the laser up initially, we had to have 10 cases. We actually had 19 cases of all sorts of different things.

We made no charge for those cases at all. So we could actually get the experience with them to see how things changed. I would say for me, it probably took me about a year or so before I was really happy where we could actually go out and market it. But it doesn't have to be that way, we could have done it a lot sooner. That was just our own choice. My own choice.

APM: Very personal question here. What contraindications should we be aware of? What damage can a laser do if it's used incorrectly?

SB: When we go and demonstrate it, you'll see that we'll be wearing goggles. Any class 3B, even a class 3A laser, definitely a class 4, will require goggles. They're protected with filters. They're specific for the individual machines. You can't just go and buy pair of goggles on the internet. They need to be for that machine based on the power of that laser, based on the wavelengths, based on that protection. That's one thing.

There reason being is like normal light, your lens and your cornea will concentrate at the back of your retina. It will concentrate to the level that it might actually damage your retina. So the first thing is you need to wear goggles.

APM: Just you said it might actually damage the retina. Is this something that's been proven to cause damage, or are you just saying we'd really better take care?

SB: It's one of the most structured things about lasers. There's the thing called OD, which is optical density. Depending on the power of the laser, depending on the wavelengths, it will have an OD factor that you must adhere to on the lenses that you are using. You want to have it thin enough that you can see where you're aiming the laser, but not thin enough that it's causing any damage in that respect.

There are radiation and laser safety officers who will advise you about the structure of your clinic, which is the best room to have it in and all the other aspects of that. That's an important factor.

APM: I remember, a fellow osteopath setting up, I think it was going to be a laser tattoo removal clinic. They had to make sure they had no reflective floors or mirrors or anything else in the room. Is that the case?

SB: There are similarities in regards of that. It's less of an issue, but yes. You would need to adhere to blinds, for instance, if you're front facing to the main streets, just to make sure that nothing's reflected out there. It's not going to penetrate beyond clothes. It's safe in regards to that. If any of your staff, or you're treating someone who's pregnant, it's safe to treat them, as long as you're not doing it over the abdomen of the pregnant person.

It's a safe modality in that respect. Because it's a photo bar stimulator, there was some work ... I'll show you this. Which was looking, this is a slide which we actually published quite recently. People in the past were thinking do not go anywhere near cancer. We still are hesitant about advising anyone to use it on cancer. But increasingly, like this piece of research that we did over there, this is a mouse model, but we've also done work in children and with gremcell carcinoma of the mouth.

We've shown that it stimulates the immune system to actually attack the cancer cells without stimulating the cancer cells to grow. We've only done it on melanomas and carcinomas in the mouse model and in certain children. There was a big multi-center study in Italy of 100 children, where they did it with gremcell carcinoma of the mouth.

The fact that they're showing that is totally contraindicative. If we'd spoken five years ago, I'd have said don't go anywhere near it. Now in the NHS, we are treating women, especially after mastectomies, who've lost all their lymph nodes and have very significant scarring. With their consent, we are not treating them to reduce scarring, to get the range of movement, to get the edema down without creating cancer cells or even stimulating maybe even any of the marginal cells that are there.

That's a massive change in five years.

APM: It sounds as though it's still a bit fringe.

SB: It is.

APM: How long before it's being nice promulgated, as it were.

SB: I would say we're still a good five years away. But there are piece of equipment being developed at the moment where you literally walk in, having had your radiation therapy, then you walk into the laser. In the five years time, if we were speaking again, I'm sure that there will be machines on the market for oncologists, especially, to be using as part of the rehab during chemotherapy, radiation, surgical procedures.

APM: What's the most common use at the moment in the NHS for laser?

SB: The most common is just rehabilitation post surgery. Also for chronic things. The biggest use in the NHS is for hands. You kindly said that that's a good anatomy. I realized how bad I was at anatomy when I went to a hand therapy unit. The complexity of someone's hand made me feel very humble in regards of what I used to do with dogs in regards of my surgery.

The amount of both the tendons and ligaments, but also the nerves and the anular ligaments mean that the concentration of problems you get and accumulate over life is quite high. Therefore, in the NHS, something like guys in Saint Thomas's, they have 30 physios and OTs working. They have two of our lasers working there. They're using it in conjunction with the rehab and pain management. Some post surgery, but the majority are tertiary referrals, where they've had 20 years of carpal tunnel or something like that.

We're using it in those scenarios along with trigger fingers and declare veins and really nasty vassectomies. A whole range of really nasty conditions within the hand sector.

APM: You've seen some resistance from the consultant surgeons in those fields?

SB: Ironically, there was initially. Until we started treating them. Then all their own ailments, which they weren't injecting themselves with steroids, surprise, surprise. They started seeing the benefits of the laser therapy. In seeing the benefits, then they were the ones who were the chief advocates to go and get it within the department. Because they control the purse strings.

APM: I have two slightly related questions here. One from Matthew Davis. Matthew, hello, welcome again. Could you outline any adverse reactions to laser in the patient themselves, you talked about the goggles and so one. What could go wrong?

SB: You could ... There's a thing called Anschultz law, which is a bit wishy washy. It says that if you over treat someone, you shouldn't cause damage, but you'll just get no benefit whatsoever. So there is an optimization of how much energy a tissue requires. Although you may be over treating the skin surface area, it should be fine lower down.

Inevitably, if you ... Depending on spot size and the power density, if you're using a laser which is a powerful laser with a small spot size, you could damage the skin.

APM: Burn it.

SB: You could burn it. Yeah. I have a slide here, which might illustrate that a little bit better. Oops, sorry. If I show you this slide here. What this slide is trying to illustrate, and your audience can see that, is on the x-axis it's about time exposure, on the y-axis you've got the irradiance, the amount of power per centimeter squared. What that line sows you, on the bottom right corner, is if you have a relatively long timeframe with out a lot of power, you get a therapy laser.

But still using an 800 nanometer beam, if you decide to go and reduce the time and increase the power, you can actually end up becoming a surgical laser.

APM: Can we get this slide up, please?

SB: If you go further and further over, you can actually oblate tissue. On these FDAC markings, we have to prove-

APM: Sorry, can we keep the slide up, please?

SB: We have to prove safety and within the parameters of a laser that's allowed to be used for therapy, we are in this therapeutic zone and not obviously getting into the surgical zone. But changing the spot size and changing the power or the time it's on can have that detrimental effect. Hence only selling it to medical profession.

APM: In terms of what the patient will experience, are they just going to say "This is feeling a bit hot now on my arm from whatever?"

SB: Andy will have experience with this. One of the positive placebo effects of a good therapy laser, especially the class 4 lasers is there is quite a lot of heat generated there. That's not a bad thing in regards of one, the patient feeling like something's happened to them there and then, rather than over along period of time.

In regards of Andy and other clinicians using it, it helps hem before the manipulations, which could be quite a painful manipulation, actually to be able to do more within the session if they treat them prior to it. If there is a placebo effect, it's the actual warming effect that it does within that tissue.

AG: I think most people would say that they feel it warm, not hot. I've never had anybody that would feel it hot. I think really the only time that we would be at the risk of making it feel hot is if you left it on for too long. Sometimes people might feel a little bit the morning after if it's a shoulder or an elbow. Then sometimes people feel it's a little bit stiff until it gets going.

Sometimes people will feel that it feels a little bit sore. But really very rarely more than that.

SB: On rare occasion, especially with the really chronic fibromyalgia patients that we treat, we actually have to tone down the power. Their natural ... Their abnormal pain sensation within the parameters that we're calibrating, obviously it's for the average person. It's not average for that person. Therefore sometimes we actually have to tone down our laser before we start ramping it up as the person progresses. So we have anesthetist and pain clinicians using it. Their initial thing is actually to go to the lowest setting, then gradually work their way up again.

APM: If you don't do that with a fibromyalgia patient, what will they experience?

SB: They'll tell you. They'll feel a prickling sensation, which an average person wouldn't get. Therefore because of the chronic pain syndromes and all the other maladapted pain that that individual is feeling, sometimes you need to work your way down. We actually did a study on peripheral nerves. Again, we did a study on 70 females. This was with chronic peripheral neuropathies.

If I show you this, we actually went and treated their lumbar sacral area and the lower limb. It was a double blind RCT crossover study. There was a very significant improvement in the patients who were treated in this case with K laser compared to the placebo group, both on the crossover and the blinded side of it.

APM: Of course, as always, those slides were flashed up quite quickly. On many devices, you won't be able to make them out. The presentation will be available to you complete after we finish, including any slides that we haven't used as well. Don't worry if you missed the detail of the slides.

Rest assured ... Andy, would you like to demonstrate how we might use this clinically?

AG: Sure.

APM: That'll be all right? We're going to go over and meet our third guest of the evening and see how that goes. Right. Good. Let's do that.

I should introduce Mr. Stephen Warren, who is a psychotherapist who has kindly decided to join us in the clinic and take his clothes off so that Andy can demonstrate what we would do for a shoulder problem.

AG: The settings on this laser ... That's great. Would be to go onto the programs panel. Then we can choose the body type, whether it's ectomorph, endomorph, or misamorph.

APM: Actually, can I interrupt. Because you said to Stephen that we're going to get some stills of this to put up for people. So they can see what this particular device is showing us.

SB: It's hard to see with the cameras and everything.

APM: The glare is too difficult.

AG: You choose the appropriate setting. Then going onto the area of the body part and for here, we're going to go onto shoulder pain. Now there are also other settings on this machine, where it can be a supersinusitis, tendonitis, bursitis. That's a little bit more for the clinical making, the clinical decisions. So if you to ward it what you've used it on and follow through the results, you can do that very, very easily on this.

We've got the color of the skin. So obviously if somebody's very pale or very dark, you change the setting accordingly, obviously the dark skin actually absorbs more heat.

SB: In answer to your questions earlier about heating, it will recalibrate according to the amount of pigment in the skin.

AG: If somebody's got a tattoo, you do the same thing. Or if they've got moles, then you do that for moles as well.

APM: We'll find out about Stephen's tattoos in a minute it looks like. Stephen, have you actually got a shoulder problem?

SW: Yes.

APM: We might need to use that microphone so that we can hear you properly.

SW: I had a fall on some stairs just over a year ago. When I actually lift the arm to a certain angle and position, there's a tightness that lasts for a few seconds each time.

APM: We brought you in here not because you have that shoulder problem, you're just a willing victim for the demonstration on you.

SB: I'll give you those. These are the goggles that we were talking about. On any good pair of goggles, they'll tell you the OD marks on them. They'll give you the actual amount that you're protected by them to

make sure that it's specific for the actual individual machine. Every laser machine will have their own specific glasses.

AG: The next setting on this machine will be whether they've got a acute, subacute, or a chronic condition. Then whether it's a high or a medium or a low pain.

APM: Feels like a Roy Orbison tribute band in here.

AG: So we were talking earlier on, yours has been going on for about a year, we'll say.

SW: Just over a year.

AG: We would call it a moderate pain.

SW: Yeah. Thank you.

AG: Okay. Normally, we would do the front of the shoulder and the back of the shoulder. So we'd cover a broad area. If we thought that there was some break or irritation, we'd incorporate the mech in that as well. But for the front of the shoulder, on the first part of the continual beam, you'd move that quite quickly, just to cover the area.

APM: That is very quick.

AG: Only on this first part. If we're going to go on the back, you go around, over the shoulder blade, up over the trapezius and the supersplinatus.

APM: The purpose of this particular rehabilitory treatment is this rapid movement treatment.

AG: So this will run through different cycles, where it uses either continuous or pulse. Depending on whether it's continuous, whether it's pulsed, will depend on the target tissue. Whether it's for pain or a little bot more for repair of the tissue as well.

SB: The hand movement is continuous. A low power laser, you'd keep on a location for about 60 seconds. This you're using over a larger area and a shorter time frame. In this case, streaming, that shoulder we're doing in about five and a half minutes.

You can hear, there's a beeping sound. When it goes beep beep beep, it actually goes to a different phase. It's made up of 10 different phases. Each of those phases is trying to treat optimizing a different tissue type. Because we spoke about power and wavelengths. The third aspect is pulse frequency.

The higher the frequency, the more soft tissue it is. The lower the frequency, the more solid structure. It goes through a whole load of phases when you're doing a complex joint. If you're only doing an achilles tendon rupture, it's a mid rupture, then you'd only have high frequency, because you're only doing soft tissue. It does depend on what's happening. This only would happen on wounds, if you're only doing a wound, it would only be high frequency.

It's a case of then just systematically working over the area and obviously Andy would be interacting with the client and asking how they felt during the procedure as well.

AG: Normally, for the first couple of sessions, we'd do it with the patient fairly static. As we know what their tolerance is and the settings that we want to be using, we'd then incorporate either a passive movement or an active movement. With that, that would be if we could get you to raise the arm just gently up, only to somebody's tolerance, you'd never go into the painful range of movement.

You can really take this through a variety, a range of movements.

SB: Do you feel sometimes also when you're doing the range of movements that it opens up that joint a bit, so you get a better aspect to it?

AG: Definitely. Yeah. Definitely. You get into the tissue and get into the joints a little bit easier.

SB: How does that feel, Steve?

SW: I can feel a warmth, that's right. I can feel a warmth as it's going over the surrounding tissue.

SB: The machine's calibrated, so once you've chosen the size of the person, the area you're wishing to treat, the color and the crynisity and the pain levels, then it's got a set protocol based on depth of penetration as you were asking earlier, skin type and also the level of pain that individual ... Even in the shoulder joint, it can vary by about 2000 Joules how much energy it's giving, depending on what you've actually fed into that protocol initially.

Like I said, sometimes, on really painful conditions, you may actually want to start lower. Then work your way up. Other times, I'm sure Andy's got experience of people who literally, like he was talking about himself in regards of his back pain, you just want to control the pain, the rehab comes later. Therefore you may put it at the highest level, just to get some degree of analgesia.

APM: We're bound to get asked how often you would treat, let's say, this particular patient, Stephen here. How often would you expect to treat him and for how long?

AG: At this stage, if it was in the chronic stage, I would probably treat him either two or three times a week for the first week, then twice a week for the next few weeks. We would, depending again on the clinical setting and the clinical aspects of it, we'd probably be looking at either doing six sessions to start with, or some people will go straight into actually booking out 12 sessions. Then obviously you can review as you go through in terms of the progress to see what you need to be doing.

SB: Do you offer a discount for going off and doing 12?

AG: We do. Yeah. We do. We tend to not use it as one off treatment, it doesn't really work like that at all, it's incremental, it builds up. A little bit like going to the gym, you just can't get fit in one go.

If people pay as they go, they pay a slightly higher fee. Normally, if they have a block booking, then they pay for the treatments in advance, then they will get a 10% discount on the six, 15% on the 12. Then if they want to book some more up after that, then they could do the same thing for another block booking if they wanted it, if they needed to.

APM: When you is that whole treatment complete?

AG: Hold on. Yes.

APM: Okay.

SB: You can say that is an individual protocol for that person. If you saved it, then you can download as a clinical audit, so you can do a treatment maybe of 12 sessions on Steve Warren. Then with or without insurance for your own clinical audit then you've got a record of that individual and how many times they've had it.

APM: And it's a lovely stand this thing comes on but I'm very perplexed by this umbilical cord that's coming out of the back of it. What's that for?

SB: This is, I'll take this off now. This, some clinicians have taken this on, and what this is, if you notice when Andy was taking it, this is actually fiber optic so one of the big differences between machines is you can tell a relatively weak laser because your diodes are in the head. Okay? In regards to most Class 4 Lasers, the diode's in there, and that's what you can hear most of the time was the fan generating.

APM: Yeah.

SB: And therefore what this is, is a fiber optic, it's not a copper wire. So this is a piece of single glass that projects it to make sure that it accurately gets there. And what this allows you to do is to be able to attach it on there, and it comes in, and then you can actually strap the fab, the cable along there. And this allows you, especially in busy clinics, you can actually run two clinics at the same time. So what happens often is the patient, especially with a shoulder or a back joint, they can be sitting there with that above them and it will just project onto the area of the back that you're trying to treat, or their shoulder or their thigh or their hip.

APM: And is that gauge the range finder?

SB: It is.

SB: They will be about a 20, or 15 centimeter distance between them and it gives you about a 150 square centimeter area that you're covering of that individual.

APM: But we just heard, when you demonstrated, you kept that head moving all the time, why was that?

SB: Because, it, I mean in regards to what Andy was doing there, you know obviously in certain areas you know you, it's not, you can't just leave it on there because of the structure and the shape of the individual. Especially elbows but also around shoulders and things. But when you're doing a flat surface like a back or a shoulder, or maybe the back of the shoulder or the hip area, then that's okay just to leave it over that area. And I've got a lot of osteo and chiro clinics that like this because it's allowed them to run two consult rooms at the same time. So, someone is in there having laser session on a certain bit, they'll be there for that five minute session, they'll go next door to help with an individual there, they'll come back and maybe realign that and then put them in. And they'll use it along a whole range of other modalities as well.

APM: Okay.

AG: But when you're using it entirely on the skin you're are reducing the scatter off the patients so-

SB: True.

AG: ... so you're getting more penetration. Which is why you can't have it, actually, on there for a prolonged period of time.

SB: That's true. The more perpendicular it is the better it is. So the moment you angle that, a bit like you were talking about glass, it will reflect off the skin. So as perpendicular as possible when it's actually being delivered into the patient.

APM: Okay. Let's return to our seats. Thank you Steven, that's very kind of you to volunteer.

SB: Thanks a lot.

APM: And you can feed back to us later how much better you feel. He was hammering, he was operated on, he was gonna tell us how much better he felt after a single treatment.

SB: That was one of twelve wasn't it?

APM: Yeah. I just want to, I love the question that was sent in, Mathew sent in earlier on, which was about adverse effects.

SB: Yeah.

APM: There was more to it than that which was about how would, how long does it take a patient to recover from the potential adverse effects? How do you justify your clinical thinking if that does happen? And again we're all very-

SB: Understood. Unfortunately in general practice I don't have the figures that you're looking for in regards of adverse events. But in the NHS we do, and in the clinics we're running, so the hand therapy, at St. Thomas', they're doing six days a week, 12 patients per laser. On an average they have, it's down to 0.001 percent adverse events. Which is pretty low-

APM: Brilliant.

SB: ... seeing that the patients there are tertiary, and they've got very severe chronic conditions.

APM: I imagine, and I don't know what the status, the statistics are for other intervention, but I imagine-

SB: It, it's one of the lowest in the whole of the, there are about 400 departments. And it, it's the highest compliance of every department as well. So, the patients enjoy the sensation as Andy was talking about and they feel the difference and therefore are more likely to come whether it's, you know, 20 minutes or whether it's an hour drive to then get to the location.

APM: Yeah. I'm glad, I haven't completely alienated my osteopathic brethren here, because I've got a comment from somebody, unknown, who says, "Contraindications to where you can use it," which I think we've covered, I mean, you're not really shining it directly into people-

SB: No.

APM: ... other than like your-

SB: Thyroid.

APM: Thyroid?

SB: Because it's a base stimulator, unless you've suffered from hyperthyroidism I wouldn't advise to do that location. But you could still go and treat the neck without having to go and do that area. I still you know, if any, we have a lot of conversation, Me and Andy, emails and the other, all clinicians of the UK email me about certain specific conditions. If there was cancer patient? I definitely, definitely wouldn't jump in there. I would make sure that you've got their consent, we can present them with papers and then it's a calculated risk you know, in regards with whether they are willing to proceed with that and that condition.

APM: But of course that applies to every patient?

SB: I would, I would be cautious with pregnant ladies, treating them. And I would do their carpal tunnel, I would do their ankle swellings but I would not go around their lower back, unfortunately, until they've had the child.

APM: Right.

SB: Because although we believe there shouldn't be a risk, you know it is a base stimulator and I wouldn't want to go and cause any problems.

APM: And we've had numerous discussions with the obstetric types on this program and of course there are various stages in a pregnancy where there is a high risk and it's not all in the first three months.

SB: Yeah.

APM: And if something goes wrong and you've been doing something with the patient, there's a good chance you're gonna get blamed. So, it's best just to steer away isn't it?

SB: Understood. I have seen it in the last five years, a big growth of maternal osteopaths though, especially treating people post child birth. And in that case we've even used, because it, as you were saying, you know from Clinaxon , it works very well on the skin and therefore a lot of unfortunate tears and other lesions that happen during the child birth period, they're using at that point in time to minimize the scaring and accelerate the healing. And then also-

APM: Think of that diabetic foot slide that you've got here? Because first of all, it's a nice gruesome sight, if you like feet, but also what struck me about this particular image is that you've got a hefty wound in one foot, and we're talking about what? 40 in two weeks between those two images and the wound is virtually gone.

SB: Yeah.

APM: And that's after three like sessions-

SB: Three sessions.

APM: Were any other interventions? I mean presumably it's been dressed and-

SB: It would have been, yeah. I mean this is, again, ironically on the same floor they have the hand therapy and they have the diabetic ward on the same floor. And so, initially we were running between the two very early on. But in this case here and we published a paper and, from St. Thomas' which was in 2005, where 80 percent of the non-healing ulcers on the feet healed after 4.6 weeks with the K-Laser, and zero percent healed with the placebo which was no laser. And they had the same pediatrist, same drugs, same position on the foot and-

APM: So they were doing everything for the-

SB: All the silver dressings, all the weight bearing bandages. Everything possible to go and make sure that that wound healed. The only difference was the intervention of the laser at that point.

APM: I've got another anonymous question, somebody has asked, "What can this do for organs? What research has been done?" For cancer you've mentioned for example ultrasound is different shock wave surely. You know I think there's a mistake, I mean ultrasound is a shock wave in the sense that it is vibration, it's not as powerful as shock wave which is a metal bearing-

SB: Differences yeah.

APM: ... intervention.

SB: I mean if you look at, this is a slide here about laser versus ultrasound, and there is an overlap. You know, so if someone who has ultrasound, there is an overlap in regards with the areas you could use it, but one area you definitely can't use ultrasound where you could use laser is over the rib cage and the abdominal area, which is what they were talking there.

APM: Yeah.

SB: And there is less research at this point in time about the effect on soft tissues apart from muscular skeletal tissues. But increasingly there is research looking at the effect on maybe perfusion of kidneys. Or in, by having gone and done surgery they're using it on areas where they've done surgery, but the research is not at the same level as the muscular and skeletal and pain level so it's still in the very early stage in regards of us to be able to make good conclusions.

APM: So I want to go back to the fibromyalgia patients, I mean what's this, I presume you're just doing pain relief for fibromyalgia is that right?

SB: No. It's more than that. The, it, sorry I know I'm showing you quite a few slides here, but there is some really really good research because looking at the effect on the metabolism and nerve cells.

APM: Okay.

SB: And therefore in treating not just the local peripheral area of the nerve, but actually the central DNA, RNA, the heart and soul of that nerve cell projected out to your finger or toe. And you are able to change the metabolism of that and have a much greater effect both peripheral neuropathies but also the interaction of the nerves centrally.

APM: Yes.

SB: And there's a lot of good research showing the sprouting and the changes and dendritic interactions between nerves when you target the actual cell body itself. And so what we're looking at in the pain clinics and there's a guy called Dr. Logan, who administers up in Chester, and his pain clinic uses it. And they use it there on fibromyalgia and polyneuralgia patients, and they've been targeting predominantly the central nervous system. They're not doing too much on the peripheral side of it.

APM: Is there some published results from that or?

SB: And that paper I showed you there, which was of 70 females, was a double blind cross over study and of, and it was targeting only

females because all of them had it as a secondary side effect of chemo therapy, or radiotherapy for ovarian or uterine cancer, so unfortunately developed the peripheral neuropathy because of the effect of the cancer cells. Cancer treatments.

APM: Okay. So, then there's some encouraging-

SB: There is, yeah.

APM: And a question from Ollie, a physio in Cornwall, it's about his specific equipment, all right? He has a NLS Class 4 Laser?

SB: Yeah.

APM: He's interested to hear of how it was used in Andy's case, to target the long bodies, given the difficulty of accessing these, the spinous processes, transverse processes, that obstruct the direct path to the disc. What position were you in for the treatment? Side line? Hip flexion?

AG: Prone.

APM: Prone.

AG: Just straight prone.

APM: Okay.

AG: Yeah.

SB: Bone is actually quite porous to laser. If you're using an 800 it's very porous. Much better than, the skin is actually quite hard to get through, bone is easy.

APM: That's fascinating. And I've had a question sitting on my list here for some time, earlier on you said that if you leave the laser long enough it's gonna go right through the tissue. And the question is, well what's actually gonna go through? Are you gonna get a light shining out the other side or?

SB: Yeah. You can detect it. I mean we have, I mean you can do it very easy to it with a six watt 800 beam, and with and infrared camera you can pick it up straight away on the other side and see all your structures of your hand.

APM: Really?

SB: So that would almost happen instantaneously. But getting down to sort of four, five, six centimeters, down to a back joint, you know that does take a little longer.

APM: Okay. I saw a lovely question here a moment ago, oh right, "Can lasers be used as deep as pons for stimulation of perfusion of CNS tissue? For example post stroke."

SB: That paper which I have up at the moment on the slide there, is actually a study looking at the, as I said bone is quite porous, and therefore the cranium actually penetrates very easily. And then this is a study looking at, which the knock-on effect is to look at strokes and they looked at four different species of human, rabbit, dog, mass model, and in all cases it penetrates it very deep into the brain. So I think there will be a new generation of research looking at the effect on strokes.

APM: What were they looking to achieve in terms of-

SB: That's a good question. Because you know there's two different areas, one is obviously the neuro-degenerative group of brain problems and then there's the acute brain damage. The acute brain damage you've got to be a little bit more cautious because a lot of these lasers are improving perfusion. The last thing you want to do is cause even more hemorrhage into the brain structure. So the timing I think is critical of how they choose to use these and when they use the, you know there needs to be some stabilization.

APM: Are they targeting clots-

SB: No. No, they'll be targeting actual neuro cells to stimulate that, but also they need to try and reduce some of the inflammation in that area which causes the secondary long term side effects.

APM: Right. Okay, so to answer to the question it does penetrate deeply-

SB: It is-

APM: ... and there is some research-

SB: There is research but it's still very early stages.

APM: Okay. And who asked this? Keith has asked this question, "With lasers so powerful they can hit planes and are available for a few quid, why are medical ones so expensive, what's the difference?" Also, "If the red laser is good for superficial wounds why not advise patients to buy a laser, point at them, for two quid and self-treat it and pretend that it's, when they watch TV?"

SB: Quite hopefully this lecture will have given some differences. But there are different wave lengths, there are different lengths, I mean the wave lengths they're looking at in affecting planes, it tends to be green and yellow lights, and they cover much further, and in that spectrum. Infrared doesn't go to far, I think you're talking about 21 feet or something like that so it's not gonna take out a plane. And so there is fundamental difference depending on the wave lengths you're using and whether they have that affect or whether they're a medical laser. It's about chromophores, which we spoke at the very beginning so you need the right wave length to target the right molecules in the body. And then there are fine tuning of that.

SB: So he's right to say that a red laser would affect the skin, but it's not gonna help anything deep in the skin because that's as far as it goes. Because it's target molecule is melanin, where if he's using an infrared, if he's using an 800, he's right. It would penetrate very deep. You know, an 800 would go all the way through you it's just how long you are willing to wait for it to do that. And therefore that's where the power of the lasers and the pulsing, that makes it more efficient at doing it quicker.

APM: Okay. Do you have any opinion if someone asks on PowerMedic Lasers?

SB: Actually I've never heard of the PowerMedic Laser.

APM: Okay. So I don't know who asked the question but, if you care to send in a little more detail about PowerMedic Lasers we might be able to answer it but it is possibly a bit of an awkward question. I imagine there are competitors who-

SB: And there are some very good competitors out there. I've never heard of a PowerMedic Laser.

APM: Okay. I can't know to, people just send these in at the last minute. It says here, "Should patients where glasses?" Well obviously-

SB: Absolutely.

APM: ... in the demonstration we saw it. "Is it safe to laser so near the heart?"

SB: Yeah, and there is some contraindications. If they have a pacemaker, again no one's ever proven it but no one ever wants to prove it. So I think it's a case of no one's wanted to go and test that out on any individual with a pacemaker. Theoretically it shouldn't affect it but no one's willing to try.

APM: Right. Pacemakers can go full bang can't they?

SB: Yeah. It's-

APM: Well the heart itself is-

SB: The heart's, yeah. Very interesting, I got an email today asking me whether I could treat cardiomyopathy and I actually have no idea. Because I've never seen any research on it and it's a muscle, and theoretically you could help the muscle but I'm not sure how laser would affect cardiomyopathy. Which tends to be a more genetic disorder or rather long term degeneration.

APM: Got one more specific here about treating a patient, I don't know the name, "I treat many of my patients with a 10 watt + 4 laser in some point in their treatment program with great effect. I find it very affective to treat, decrease the pain of, RA, fibromyalgia and more obscurely CRPS. However, I'm struggling to find any great evidence with treatment with RA." Is there anything in your research that has been missed or anything?

SB: There is less, there is less research. There is one or two papers out there looking at rheumatoid arthritis, but they're mixed. And I don't think we know enough about it, and I don't know whether that's because the disease process itself, we don't know enough about it. Because I've had some, on a case study basis, I've had some very good success. But I've also had individuals who have had an adverse reaction to it. So, they've actually got more painful initially, and I have no reason to understand the differences between those individuals. But it's the one case when you asked about adverse effects, actually I have had one with a rheumatoid arthritic patient where nine out of 10 times I was doing fine, and I have one which completely reacted the opposite of what I was expecting. And looking back at everything I still couldn't understand why, but it is different obviously to a normal arthritic joint, and therefore whether that inflammatory process or the erosions or what happened in that individual was exacerbated by the laser, I can't tell you. But they didn't do well.

APM: Okay. Well I guess Mathew is now wondering again about how if they complain, how you justify your clinical thinking given you said there's no great research into RA.

SB: There isn't. I mean it's bad extrapolation, you know? We know that they help on inflammation and acute inflammation, we know that there's some pain management aspect, we know there's assimilation of hopefully healthy tissue. Unfortunately in a rheumatoid arthritic patient, that isn't the simple process.

APM: Your consenting process would have to be quite-

SB: Yeah. And I would go cautiously. I would start relatively lower power and work your way up with an individual like that.

APM: Yeah. One comment here, it's talking about our little demonstration, they say, "It looks like a scene from a Quentin Tarantino film." So.

SB: Less bloody.

APM: Lorna asks, "Which cancer centers are using laser post mastectomy?" Do you know?

SB: In Europe it tends to be mainly Italian and French universities. And that's because most of the research is being done out of there. In, at the moment it's still very preliminary in the UK. You know, there is one or two NHS Hospitals that are using it but only ADHOC rather than as the mainstream. And interesting though, if you look on my, one of the, based on the paper that we published, they actually now do accept it for using it on leukocytis for children who have suffered with squamous cell carcinoma. So, research has got through to the level of mice where they actually are adopting that which is news, and relatively a recent change.

APM: All right. I'm gonna ignore all the comments. There are several comments about us looking like the Blues Brothers over there, behind Steven doing the treatment. But, maybe as an alternative career. This I, I think this is probably something that's going through several peoples mind I've got a feeling, I've seen it, I've got two comments, yeah two comments about this. "12 sessions of laser seems rather excessive and expensive for the patient. Could free physio and a deep injection suffice? What are your thoughts?" And the other one was, "Wouldn't manual therapy take less time in dealing with these things?"

AG: I think as with everything, it stands with the individual person. It's stands with their tolerance, some people like manual therapy, some people don't. Some tolerate it better than others.

APM: You've had manual therapy for your back though have you?

AG: Yeah, but my, when my, I had prior to the incident, I have since. But at the time my back wouldn't tolerate it.

APM: Okay.

AG: And it doesn't mean to say that the 12 sessions is set, obviously that can be adaptable, six or two or whatever. So it's not set in stone, it's

never set in stone it's just a working model. But what we try and think about is actually the tissue that you're working on and the tissue's adaptability and how long they've had it. So there's lots of things that come into play to whether you think it's required or not.

APM: Okay.

SB: This slide goes and helps, in regards to this. This is kind of a rule of thumb that we use and where, we try and recommend that the person, for a chronic situation, goes and books six sessions. Because the realistic thing is they're not gonna feel a huge great difference after two or three sessions. Because if that's so chronic, it often needs that level of repetitive treatments to go and start to show biological which then shows the clinical change. And but with acute injuries, Andy's exactly right, you may only need one treatment, you know, it depends on how severe the injury is and how you know, yeah. And therefore sometimes it's four sessions, you know, there is no rule of thumb in regards but-

APM: Have you used it on frozen shoulders?

AG: Yes.

APM: And how effective have you found it on those?

AG: Very. Very. I'm not saying that it's a panacea and it's a fix all, because it's not. We know what's frozen shoulders are, we know by nature of just clinically the way that they progress.

APM: But they don't progress quickly under manual therapy do they?

AG: No. But what we've seen when we've combined the laser therapy with some manual therapy, is that the response in terms of their pain, in terms of improvement, their function seems to be better.

APM: Right.

AG: Going back to your question about whether people will want 12 or not, I've got several patients for different things that we used it on where we've said at seven or eight, "Do you want to carry on?" Because they've reached a point where they're doing most things normally but they've still got an element of discomfort or pain. And I've not had one person at all in two years where they've said, "No, we need to stop at this point."

APM: You don't sound to me like that type of practitioner who is horribly pushy about getting patients to come back for multiple sessions either, if I may say so.

AG: No. No. No.

APM: And-

AG: People come in and they, what we think is relevant, we talk to them about it. It's very individual, it's tailored to them. They're in control in effect, we make a treatment plan with them but obviously that can change, and it can change either way. So they're in control but at least having that open discussion with somebody, making that working plan so everybody's happy with the way you're going.

APM: Yeah. I've got to rush through this, a few questions quickly. But if you don't mind once again, we'll send you the, and you can comment on it afterwards-

SB: Absolutely.

APM: ... get some answers from you. Could this help with Dupuytren's Contracture?

SB: Yeah. We were doing this at-

APM: I thought you mentioned it early on-

SB: Yeah.

APM: ... finger and so on?

SB: Again, it's one of those things, the earlier you work with it the better. The ones we were seeing, by then they were total claw hands and five years in the making. The earlier you start the better, but even with one flat back, it will definitely take 12 sessions. But you will get back the range of movement and the flexibility. The more scaring the longer it will take.

APM: Steve Rodger is a chiropractor and asks if it's any good on plantar fasciitis and Morton's Neuroma?

SB: Yes we use it, yeah. We, there is actually, we have the software on there specifically for that.

APM: Both?

SB: For podiatrists or other clinicians to use for plantar fascitis, yes.

APM: Morton's Neuroma?

SB: Yeah. It would, we found out the benefits of Neuromas more by chance. We were treating often, arthritic joints and the comment from the clients was how the neuroma or, has decreased in size. So it was almost by chance that we found out that it was having a positive effect on that, when we were actually treating other things in the same vicinity.

APM: And from Bob Allen here, evening Bob. Really interesting talk, he's long wondered about the efficacy of laser treatment, up to now he hasn't been totally convinced partly due to the variety of lasers out there-

SB: Sure.

APM: ... the difficulty of knowing which one is most efficient. And he's asked a question which has been brought up by a whole lot of other people, and there are a lot of slides on this in the pack, but what's the cost of, the running cost in this kit?

SB: Unfortunately, obviously within osteopathic, far as it, you have to pay VAT. So VAT is a real cost on equipment the, most people purchase the laser through a lease or a hire purchase, and through a finance company they'll work out what the best option is on a tax basis for that company or the partnership. But it tends to work out around between about 12 to about 20 pounds a working day. And for a lease company, depending on the term, the length of term you're doing it, so one treatment a day, and you've made profit on it.

APM: If I'd bought that machine that we just used, that K-Laser, outright?

SB: Yeah.

APM: What would it cost me?

AG: It'd been about 20 grand.

APM: So three thousand a visit? Quite a bit of treatment needed to repay that. How long did it take you to pay back your investment on these?

AG: We, we-

APM: Have you paid it back?

AG: Yeah we have. We have had that machine there for two years and as we spoke at the beginning, we did no marketing on it. It was just a case of very often actually, giving people care so we could get to groups where we could understand it and get used to it. But we are

doing somewhere around 100, 110, 120 laser sessions per month at the moment.

APM: Okay. Yes. And do they all have to be done by you, a Chiropractor, or could you get anyone, an assistant to do this?

SB: Well what I'd say is, whoever you buy through make sure the equipment fits the purpose, but also make sure the company's fit for purpose as well. Because you know, you need a company that's gonna invest in you as an individual and really train you so that you know, there is a learning curve, and I mean Andy is unusual in the sense of spending so long before he was comfortable promoting it. You know most people go and promote it right from day one, and that was very ethical way of going, dealing with it and getting confident in the product itself. We go and then we spend at least of couple of days training people, and all the staff so that they could, they're competent in it. But then it's an ongoing process so you know, I received even today, probably about 20 different emails by people asking me how to manipulate this, how to do that. So it should be an ongoing relationship to go and get the best out of that.

SB: The other thing is to make sure that the machine has software updates. Because, even this week they'll be 10 good papers published, and therefore the technology is good but also what we know is improving all the time and therefore having a machine that allows you to update it is really important as well.

APM: What's the maintenance like on these? Do you have to replace the heads every so often? Is it expensive?

SB: I've been working with K-Laser since 2011, and I've not had to replace one diode in over 600 machines.

APM: Right. Eight years going on. It's getting on for eight years.

SB: And you know, I mean, Andy's not unusual in the sense that of using it 120 times a month. So that's quite a lot of use out of a machine. And that's consults, so you're often doing-

AG: So I'll probably do two or three sessions per consultation. And it's only our clinicians that use the laser.

SB: I would say medical clinicians, especially because they're buying it for themselves and their own use, much better than Vets. Vets, terrible with equipment, they break things all the time but even under that veterinary supervision, these things tend to last a long time. But that fiber optic cable I was showing you, is a fiber optic cable, it's not a copper wire. So you do need to take care of that.

APM: Right. Okay. You in a hurry to leave?

AG: No I'm fine.

APM: Because we're almost bang on time, I'm suppose to finish this. But I've got a lot of questions here and I'd actually really like to cover a few more if you're happy just to go on for a few minutes?

AG: Sure.

SB: Sure.

APM: And likewise, I hope you at home are happy just to sit for a bit longer if not then it'll be on the recording later on. Mathew Davis gets a second bite at the cherry, because he's pretty, and he wrote in commas with two exclamation marks, "Cavitation danger." There was something on your slide that said there's a danger of cavitation.

SB: Yes. There was a danger in regards of using ultrasound but not, if we go to that-

APM: Oh, I think he's got, he's not the only person, it was one of the laser dangers as well.

SB: No. So on that slide there, the, under the slide column of laser, it is no danger to use on cavitation, and it's, you don't need any transition gel. The other beauty about it is you can use lasers over metal, so if someone's had a hip replacement or a knee replacement, you can use it very safely over there, it's not going to cause any heating. They've got leg screws, or they've got screws in their achilles tendon, they could use it over that, no problem. And you can also use it over broken skin which is a big benefit because often on the rehab side of things, what stops you getting in there early is that wound. And the fact that you can accelerate that healing superficially to get that wound to an optimal level, means you can get in there and use other interventions quicker. Especially post surgically.

APM: Another complicated one as far as I'm concerned, is this one that and I used to hate it at college, it's, "What is the result of stimulating of Cytochrome-C and how does that affect the Krebs cycle? I actually, every time anyone mentioned the Krebs cycles.

SB: I didn't have to retake biochemistry twice, but it was a pretty close thing. So, I find myself in this weird juxtaposition of now talking about the Krebs cycle more often than I ever thought I would be. Cytochrome-C, as this person alludes to, is the final process in the Krebs cycle. And it is the final process of producing ATP which is the energy source that all our oxygen, or all our food sources are

converted to, and allows us to do all the biological processes that we need to do. Therefore, in optimizing the reaction of Cytochrome-C, you produce more ATP, and therefore you get more proteins, carbohydrates, cell division happening. What's interesting and people don't understand this, is when you use a good therapy laser and you look at a tendon, you think, "Okay it just stimulates things." But what actually happens is you get much more Type-1 collagen and a lower percentage of Type-3 collagen which is the scar collagen.

SB: And therefore actually from an athletic point of view, working with the Olympic Team in the UK, you actually get a better overall tendon result after quite major injuries, and closer to what the original tendon was prior to the injury, which is great right? Rather than a standard scar, which would have a much higher proportion to pad through.

APM: Okay. There was a question in here about damage to developing fetuses, oh yes. But I think, I'm not sure about this question because of course you said keep away from developing fetuses.

SB: I would not go near, the, potentially there is this risk, no one's ever tested it. But you know, the thin fact that it, even though that they have lenses, and they have corneas, you know if you did shine it over a fetus it could potentially damage the retina of a fetus even before it's been born.

APM: There's one comment that's been sent in by, I guess another anonymous person, but they were talking about James Cowell doing some research or something recently. Was talking about using lasers to treat macular degeneration.

SB: There, it would, there is work looking, I'm not sure James Cowell's done that, but there is work with other lasers for, he, or attempting to heal macular degeneration by stabilizing the membrane at the back of the eye. It's a very different laser to one that Andy and other people have been using in regards of therapy, for muscular, skeletal and pain management. But there are some lasers that I believe are being developed for ophthalmology use.

APM: Can you use it for bone bruises?

SB: Again yes, it will reduce the inflammation in regards of that area and it will stabilize that tissue quicker. We would, got, for instance the British Under 21 Rugby Team, or Under 18s, I think they are, they're often obviously getting bone bruises and it's used a lot in regards to that.

APM: Let me give you just a couple more if I may. Can it be used in preventing adhesions after surgery?

SB: In that area, ultrasound, shock wave ultrasound is better.

APM: Shock wave?

SB: Yeah.

APM: Right.

SB: Because the physicality of that can break up that scar tissue, especially where there's adhesions much more efficiently than the laser would. The laser will do it, but it takes a longer period of time. So there are some studies of using the too in combination, and in that respect, I'm not saying the laser is a panacea for everything, there are good modality tools to be used out there where you can actually get a better synergy with them. And definitely in most scenarios, when use a shock wave to break that scar and then the laser afterwards, you get a better overall result from using the two in combination.

APM: And I like this question, this sort of hulks back to what your, what you were discussing about strokes. "Can you use this on patients who are, can you use it on patients who are on anticoagulants?"

SB: Yeah. There's no problem in using on anticoagulants. The only, the only people I'd be a little worried by is if they, you know they've got some sort of collagen problem as well. What's it called? There's certain diseases where they've got collagen, therefore they're bleeding out because of the problem's actually in the fibers rather than the actual clotting factors. It shouldn't affect anything to do with clotting. But it would affect someone, or obviously if they had a bruise which is because of the genetic abnormalities in collagen formation.

APM: Yeah. Okay. And here's an interesting one, "Are laser therapies commonly covered by private medical insurance?"

SB: I'll leave that to Andy to discuss.

AG: Yeah. We, we had somebody in regarding Bupa recently and Bupa do not. There are other insurances that have, so I think it depends on the policy and the individual insurer.

APM: Yeah, okay.

SB: I think it also depends, a physio therapist actually do have it covered under their policies. So there are codes for physio therapists. Which I don't understand why, that's not transponded to chiropractors or

osteos with the same company. And therefore, it does depend on actually your profession as well.

APM: Yeah, that doesn't make sense at all.

SB: It doesn't. I agree with you.

APM: It probably makes financial sense for the insurance companies.

SB: We had a debate earlier this evening about, you know, the challenges of trying to get some common sense out of insurance companies in regards to their procedures.

APM: Yes. Yeah. Guys, I've got I think a dozen questions here, some of which may be repeats of other questions, I haven't asked them, and we're already nearly 10 minutes late in tonight's broadcast. But I have to say that, I mean I came this evening having, you know I had the discussion with Tim Watson, and I was thinking, "Who are you? What am I gonna get from this? Is this just a shiny toy that we could use in clinic, save our hands a bit but it's." Actually I've learned a hell of a lot about what it's, what it does at the molecular level and how it can be used therapeutically. I suspect there will still be some skeptics out there amongst the audience and that's healthy and nice.

SB: Sure.

APM: But none the less, I'm quite impressed at what I've heard this evening, I'm not sure I'm gonna shell out 20 thousand pounds just yet, but I'll look at those other slides and presentation and then we'll see what, you know what other crosses to work out. But it's been a fascinating discussion thank you very much. And Andy thank you for coming in and-

AG: Thank you.

APM: ... and demonstrating the kit. And although he's off camera, thank you to Steven for being our patient this evening. Yeah, it's been a great evening and maybe we can do this again when we've got even more research on different conditions.

SB: Thank you.

APM: Thank you this evening.

AG: Thank you.

APM: And we'll get in touch some other time I hope.

SB: Thank you.