Academy of PHYSICAL MEDICINE

Transcript

Scoliosis
With Deborah Turnbull & Sally Hews

Cast List

Steven Bruce	SB
Deborah Turnbull	DT
Sally Hews	SH
Jono A'Brook	JA

SB: I have some special guests with me today. And I'm really pleased that you could join us because I thought you'd be out celebrating, this being the 467th birthday of Richard III, who would have been ... He would have been 467 had he not died at the age of 33 in the Battle of Bosworth Field and been unceremoniously buried in a Leicester carpark. And I mention him because, of course, he was a sufferer of juvenile scoliosis so I'm told. I suspect that one of our guests at least will know more about that than I do, because I am joined by two experts from the London Orthotic Consultancy. I have Sally Hews. Sally, you're an orthotist?

SH: I am.

SB: And I have Deborah Turnbull. Deborah, you're a physio. You're a Schroth physio-

DT: Right. Yeah.

SB: ... which we'll find out more about later. And unusually, we have a fourth surprise guest in the audience. I say surprise guest because actually until this evening, he didn't know he was going to be on camera. But, I'm joined by an old friend and osteopathic colleague, Jono A'Brook. Jono, welcome, and thank you for agreeing to be on set at the last minute.

JA: Thank you very much.

SB: I know your thoughts, your knowledge, will be of great value because you are a walking textbook when it comes to medical matters.

JA: Bless you.

SB: It'll be a harder job to keep him quiet than anything else. Right, where do we start? I'll tell you what, let's start ... Most osteopaths think about orthotics as being something you stick in your shoes, so tell us what an orthotist does. What's an orthotist's training involve?

SH: So, an orthotist attends university for four years, and the degree that we practice is actually prosthetics and orthotics, so you're qualified to do prosthetic limbs and orthotics. Orthotics is any kind of device that is applied to the body to either improve alignment or correct deformity, improve comfort.

SB: Right, okay. So you could do foot orthotics, as well?

SH: Yeah, foot orthotics all the way up to helmets on the head, so every part of the body we treat.

SB: Okay. And Debbie, you're a physio. You're a Schroth physio, but that's a post-graduate qualification for you?

DT: That's right, yeah. So you go for training in different parts of Europe. Yeah, you don't ... quite unique.

SB: Right. Where'd you train?

DT: I trained in Germany and also in the Netherlands, as well.

SB: Is that a long course, and I know we'll get onto the detail later because of course-

DT: Yeah. It can be two weeks. It can be one week. I think the course that we're discussing today, it was one week, yeah.

SB: Okay, right. Sally, tell us about the London Orthotic Consultancy before we go any further, because we need to establish why I've got you in here to talk about, or you both in here to talk about, juvenile scoliosis, or scoliosis generally.

SH: The London Orthotics Consultancy is a private orthotic clinic in Kingston. We treat a lot of neuromuscular conditions there. We are quite specialist in this type of orthoses we supply and provide patients with.

SB: You say it's just scoliosis that you treat then?

SH: No, no. We have a gait lab, so we treat a lot of CP patients with ankle/foot orthoses. We also specialize in treatment for plagiocephaly for babies. The scoliosis clinic has been there for three years, and that was set up by Debs and I together.

SB: Oh, right, okay. I didn't realize that you'd set up the scoliosis unit.

SH: Yeah.

SB: I'm very impressed. Very glad we finally managed to talk to you because we'd been approaching you for ages to come on this show. I'm really pleased that we managed to get you in here.

SH: Yeah, we've been busy.

SB: Yeah, I'm sure you have. Are there other clinics like it anywhere in the UK? Are there other specifically scoliotic, scoliosis orthotic clinics?

SH: There are a few private orthotic clinics, but we have quite a unique model in the way we practice, and in Europe, there are more specialist orthotic practices that we have kind of looked at and tried to achieve their gold standard really.

SB: Yeah, the reason I ask is, of course, because if you're nowhere near London, that's not very helpful to somebody watching this program who's based in Edinburgh or whatever, and they'd say well they'd might be interested to know whether they can get the same sort of service elsewhere in the country. But I guess we need to find out what that service entails.

DT: We do have other clinics, as well though don't we?

SH: We do, yeah. Obviously there is a need all over UK, so we do have a clinic, for example, in Cambridge.

DT: In Portland Hospital in London, as well.

SH: That's right. And hopefully expanding out-

SB: The poor northerners are neglected.

SH: Manchester isn't far from-

DT: Yes, Manchester.

SH: ... yeah, around the corner. But it's-

SB: And if HS2 comes online, it'll be 20 minutes quicker to get to Birmingham, as well. All right, we're not going down a political route. Yeah.

SH: But, at the moment our scoliosis clinic is centered in Kingston.

SB: Right. Do you want to give us ... Well actually, there's another question which intrigued me because you were discussing this before we went on air, is how much do physiotherapists cover scoliosis during your standard physiotherapy undergraduate training?

DT: There's nothing really on the curriculum. You're kind of, it's mentioned as a postural issue, but as an undergraduate, there's no specific training. I think there's a lot of good problem solving that happens, but there's nothing scoliosis-specific as an undergraduate. So unless you're willing to travel abroad, which I had to, to find out about more conservative treatments, a lot of scoliosis patients just face the surgery here unfortunately.

SB: Jono, what's your recollection of what osteopaths get taught as undergraduates about scoliosis?

JA: I think we got more than nothing, and I think it was because we're quite spinal-mechanic-focused, or at least we were at the British School of Osteopathy, it's still not enough to describe it as I assume the intensity you went through if you did a week-long specialist course. But, it comes up often, and rightly so, I think in clinical exposure. The lateral curves of the spine are kind of our bread and butter to one degree or another.

SB: Do you think, though, and when you talk about scoliosis, you're talking about specific measures of scoliosis, and I imagine whereas we tended to call any curve at all as a scoliosis and address it perhaps in a different fashion.

JA: To avoid that term.

SB: At the LOC, what is your definition of scoliosis?

DT: It's three dimensional.

SB: Right.

DT: May I show you?

SB: Yes, please. Color props, we like this.

DT: Yes. You're taught there's a lateral curve of the spine. It's a bit of a oversimplified, because from my perspective, that's of a surgeon, because obviously you're looking at Cobb angle, and that's the only thing they really tend to look at. Whereas we know that if you look-

SB: Right, now before you go on-

DT: Yeah, sorry.

SB: ... Debbie, if you wouldn't mind, I suspect that many people will know what the Cobb angle is, but can you give us a quick illustration of how you measure a Cobb angle?

DT: Yep. I think Sally, this is your ...

SH: We're measuring a Cobb angle with looking at the apical vertebra and the end vertebra, so the most wedged top and bottom. Then we're taking a perpendicular measure each way, and then simply drawing lines to meet the-

SB: Right. So this has got to be done radiographically, hasn't it?

SH: It does, yeah. You can't measure a Cobb angle without an x-ray. But, a lot of patients that we see haven't got the far yet. People come to the London Orthotic Consultancy, or people make inquiries if they have been to a consultant and had a diagnosis of scoliosis. But they've also ... Parents have just noticed something on the back, so it's not ... It can be we're not just dealing with Cobb angle, we're dealing with a lot of what we're seeing visually and the posture of the patient.

SB: Does a Cobb angle have to reach a certain level before you would intervene? Or before you'd expect to see patients perhaps?

SH: From my point of view, bracing, it does tend to be a Cobb angle of over 20 degrees, typically 25, and as an orthotist, you, in your training, you learn that a conservative treatment is between 25 degrees and 40, but actually, we treat curves of much higher now, so our understanding has developed of what's possible with conservative treatment.

SB: I was led to believe that inter examiner variability on measuring Cobb angles is actually quite high. Is that true?

SH: Yes, I think so. So, if we see an x-ray that's come from a consultant, then we take our own measurements, and yeah, a plus or minus of five degrees is a normal variation.

SB: Okay. So, sorry, we were talking about definitions of scoliosis, I think, when-

DT: No, yep. Sorry.

SB: ... we got off on a tangent of Cobb angle.

DT: Yep, so if you look at any of the skeletons of ... you can look in some books, for example, the sagittal plane is quite flat. In fact, the usual kyphosis, especially if you've got a thoracic curve ... A major thoracic curve will actually be the opportunity of kyphosis. It will be hollow. So, although they might have a rotation element, the actual spine is forward. And if they have a lower curve, what you'll might notice is there's a kyphosis at the L-1-

JA: In the lower spine, yeah.

DT: Yeah. So that's going on. It's like the spine is destabilizing.

JA: This is what you mean about it being three dimensional.

DT: Yes. And if you look not only at Cobb angles, if you look at the three dimensional parts of the spine, it is actually deforming on three dimensions. It's like the spine is deforming and it's reacting. The problem is that obviously 80% of cases is idiopathic. We're not sure about the cause of that. But what we've kind of come to realize with Schroth and with from this asymmetry bracing, is that there's ... What we do know is that there's a cycle happening if you put the-

JA: It follows the logical path.

DT: Yes. So, okay, we don't know why they have it, but what we do know is that-

SB: We’re going to go to slide one, I think.

SH: Slide one, yeah.

SB: There we go.

SH: There we go.

DT: So we know that the load is going through one side of the spine more than the other.

JA: Yeah.

DT: Obviously in periods of growth, these growth plates inside, if it's on the concave side, it's unable to grow because of that asymmetrical loading, yeah? And this side continues.

JA: I understand.

DT: And the Cobb angle increases when there's growth. Yeah? But obviously, if we, three dimensionally offload that-

JA: Then you change that influence.

DT: Yes. But, we have to change the posture in order to change the angle. So we're not aiming at overcorrection in the bracing. We're aiming at over correcting the posture.

JA: I understand. How do you change the posture?

DT: Well, if you go back to ... Sorry, I keep flipping around the slides.

SB: That's fine.

SH: No

DT: But if you go back to the blocks ... next one yeah. So Schroth was actually a physio in the 1920s, and Schroth is the family name. And she realized that what was happening with the body was that the pelvis was shifting away from the main curve. If you look on the left side ... picture, the pelvis is shifting away from the curve. The main curve is thoracic, the rib cage, yeah?

JA: Mm-hmm.

DT: And the shoulders are twisted forward, as well. And on the right hand side is just the different patterns. You have a lower curve, as well, a double major curve, if you like.

JA: I understand.

DT: What she realized is if we put the person in the opposite position and exercise them, we can actually have an influence on the scoliosis in the middle. It's not brain science, as such, but it's a very simple effective thing. And obviously, if they've got up to 25 degrees, I'll be exercising them and that will be enough. However, if they're going through a big growth spurt, and they're 20 or above, I'll be recommending-

SB: If you've got somebody with a Cobb angle of 25 degrees, to what extent will you be able to correct that?

DT: If it was a girl at the beginning of puberty, I would probably recommend a brace, anything from 20 and above, because it's at such a risk, you know? But I've known to have a-

JA: That's the risk of deterioration.

DT: Progression, yeah.

JA: Progression.

DT: A huge amount of growth spurt, if you're having that loading happening, can get worse quite quickly. But I've improved some children from 18 degrees down to like practically zero with just the exercise alone, but it is hard work for a young-

SB: For them, for you.

DT: Actually for the young child, yeah. Yeah.

SH: When people have this diagnosis of scoliosis, they don't know what to do, and they don't know where to go, but they know they want to do something. So, if they come into our clinic, then we don't quite know which one of us is going to be more involved in their care.

SB: Okay, so what's the screening process? What happens when someone pitches up at the clinic, who do they talk to? Both of you or ...

DT: Tends to be me. But sometimes you, isn't it?

SH: Yeah.

DT: But, we use a scoliometer. I haven't got one with me today, but you're basically looking at a certain amount of rotation. You're looking at them physically, have they got this pattern. Is this happening? So you're looking for that rotated shoulder aren't you, and-

SH: And when were they diagnosed. We look at their progression, risk of progression. And so, are they premenarchal? How much growth have they got? How much growth do we expect to see in the next year or so? And whether it can be managed with exercises alone.

JA: Do you require that growth potential to apply a specific technique? Do they need to still be growing in order to be effective in some or specific cases?

DT: It depends on their expectation, doesn't it? I think if they're at the later stages of growth, they may still want to see Sally to see if a brace is something that they want to consider, or they may not want it, and so exercise might be their thing, and they can improve their appearance, and that might be what they want.

SH: It depends what their objective is, really. Obviously improvement is always an objective. But if they are towards ... if they're reaching skeletal maturity, we obviously ... the outcome is going to be significantly different to perhaps a juvenile patient.

JA: Understood.

SH: So, it's just about-

JA: And it's quite patient-centric. It's about, I imagine you have to teach them ... You have to manage their expectations, but there are a number of ways to go. It's not just the dry clinical assessment, "Because you're of this stage in your late growth, you can only do this." There are options.

SH: Yes. Absolutely.

DT: Yeah, absolutely. Empowering, yeah.

SH: And a lot of that is we spend a lot of our time in just a full-on discussion mode with the parents and the patient, and what do they want to get out of this, and what are they willing to put into it. Obviously it's a huge deal, particularly for young females. So, we can help them generally, most of the time. Just how we do that depends on many things.

DT: Yeah.

JA: As an osteopath, I suppose I'm more of a functionalist than a structuralist. How much of that decision is made by what you see is still moving or how do you assess the potential for going more towards exercise if that's what they want to do or are capable of doing?

DT: If it's just exercise, if they don't want a brace, we won't give them a brace, because you do have to be determined. It is a process, and it's a hard process. But again, with the exercise, if you want to make a difference, it is about committing for at least a home program. I don't own the patient. I get them to do their own home program.

JA: Understood.

DT: And that will be, if they're not braced at all, and they're going through a growth spurt, and they're insisting, "I'm not wearing a brace," then you're looking at an hour a day. So it is-

JA: It's quite a commitment.

DT: Yeah, and if you got less than 25 degrees, your posture isn't going to be so bad, so it's not ... It's a little bit easier.

JA: Do you find that motivates those of less than 25 degrees to work harder?

DT: Sometimes.

JA: Is it easier to motivate someone with less of an effect because you know that they can change it more significantly or faster or ...

DT: It can be easier for them to ... Yeah, especially if I'm teaching them an ADL or posture to hold.

JA: What's ADL?

DT: Activity Daily Living, so you know you're looking at your sitting positions, your sleeping positions, your standing positions. All of these things change, and there's certain patterns that are going to be a problem.

SB: What age range are we talking about generally here?

DT: For ...

SB: You were talking about these exercises. You were talking about people who are in their growth spurt or pre-growth spurt.

DT: If you're looking at juveniles, I tend to go by if they can do a times table, they can do the exercises.

SB: Right. But does that mean that they're going to have to have a lot of parental support to make that happen, as well?

DT: Yeah. Absolutely. If they're young, yes.

SB: And do you find that parents are engaged in that, or ...

DT: Yes, especially if sometimes, because it's genetically linked, especially if Mom's had to have the operation, for example, they'll be very-

SB: Isn't that quite rare, genetic, congenital scoliosis?

DT: No, I think there's lots of genetic links. There's no definite gene, but there's-

SH: A familial idiopathic trait, yeah.

DT: Yeah.

JA: Which might be ... This is the bit that I really want to probe. I understand we don't really know. We don't have the evidence behind our suspicions, but what are your suspicions for, in any part of the idiopathic spectrum, what do you think are the building blocks of what leads some people to this condition?

DT: I think it's susceptibility. Sometimes a whole family comes in and they all have it. They all bend over. But there's one that's very much more flexible. Sports-wise, we want to encourage them to do sports, but I don't encourage them to do gymnastics. There's a lot of thoracic extension involved in these sports.

JA: You feel that might exaggerate the propensity-

DT: Yes.

JA: ... towards reverse curves?

SH: We do see a lot of gymnasts.

DT: Yes, we do. And dancers, ballet, the Royal Ballet, and lots of flat feet.

SH: Yeah.

DT: Yeah, so there's susceptibility. There's genes. And there's environment. And it think there's a overlap of all, and I don't think one thing is causing the whole picture, if that's the ... But you always want to know if there is anything.

JA: If a good family history of everybody or a few people have a vulnerability towards lateral curves or scoliosis rotation, that's like carrying a genetic history. That's a background.

DT: Yeah.

JA: Do you get much ... Well, I understand what you said especially when the parent has been through that, there's a sort of almost a vicarious motivation to ... They encourage their children not to come through ... go through the same things that they went through. Do you find ... Where everybody's looking for prevention of all sorts of things, do you ever delve into the world of you know this generation and the generation before, and maybe the generation before all had scoliosis, do you ever see kids before they've developed scoliosis-

DT: Yeah.

JA: ... because of their parents and their siblings?

DT: Yep, yep.

JA: And what, purely theoretical, I won't hold you to any of it, what do you say to the parents of a young child who hasn't yet got his scoliosis, but may be vulnerable to it?

DT: A lot of them come in, and they have a certain amount of rotation, but the rotation to me isn't enough for me to say, "Go have an x-ray." So I just want to restabilize the spine, so it's just the normal general posture, stabilizing lordosis, kyphosis, and just monitor, and keep-

SB: What does that mean? When you say stabilizing the spine, what do you mean-

DT: The sagittal profile. So, as we spoke of before, maintain-

SB: But what techniques do you advise? What do you-

DT: I don't give them three dimensional exercises if they haven't got scoliosis. I get them to focus on their posture. If they're going to go on a tablet, then have a good posture. Just reinforce that. But, get them involved in good sports that are good extension sports, so your netball, volleyball, basketball, which all switch on your extensors.

SB: I do notice that a lot of your language is about women or girls.

DT: Yes. Basketball?

SB: You talk about premenarchal women. You talked about volleyball, which of course ... netball, sorry, which of course, yes, men play it but very relatively rarely. I mean, am I right in thinking that scoliosis is more prevalent in young women, young girls?

DT: Two thirds, yes.

SB: Two thirds?

SH: We do have male patients.

SB: Oh yeah, yeah, sure, I'm sure.

SH: We don't mean to ignore them, but yes, absolutely, much more female based. And when we tend to see ... it's those siblings, where they're all coming in for an appointment together, that's when perhaps the mother is saying, "I'm worried that perhaps he or she has also got it."

JA: Hasn't got it yet, but-

SH: "Can you have a look?" And then that's when the stabilizing the sagittal plane and good techniques and good advice comes into play.

DT: Come in, yeah.

SB: One thing that did occur to me, actually, as you were talking earlier on and sort of hinted at, is that with many of the people who come in here, we talk about the power of language, one way or another. Do you feel that when patients see an osteopath, a chiropractor, a physiotherapist, and, "So, you've got a scoliosis or the C-curve, this way or that way," actually they hear the word scoliosis and think, "Oh my God. I've got some dreadful deformity," when actually all we mean is there's a tiny little curve which could be due to a leg length difference or a hip rotation or whatever. Is it of a word we should be cautious using in our clinics, because people are sensitive to it?

SH: I think when the patients that I tend to see are further on, they've got, perhaps a greater curve, and they're actively looking for treatment, so that's already passed, so I perhaps don't see that.

SB: We can guarantee that the minute we say something to a patient, or as soon as they've left our treatment room, they will go onto Google and they'll say, "What's the scoliosis?" Even though you've told them.

SH: Yeah.

DT: I tell them not to Google it. Don't Google. But I think if they've not reached the bracing point, it's more about kind of ... One of the first things I say to them if they're an adolescent and they've not got a lot of growth left, I say to them, "Scoliosis is really unlikely to kill you." It suddenly calms everybody down because they've been to see a surgeon, and that's the only person they've had contact with. So, knowing that it's probably not going to kill you because you're an older adolescent, so the progression factors are less. But obviously with juveniles, they do need treatment, so it's a bit different actually.

JA: I can see how the reverse for many specialties, you don't start with a surgeon and work down. You generally start at the bottom and work up, triaged, and then slowly exposed, the severity is revealed.

SB: Debbie, so if I can interrupt, I'm not sure we covered this earlier on. Is there something specific about the Schroth approach which would be different to anyone else's approach to scoliosis?

DT: Yes, because it's specific to scoliosis. You're looking for a pattern, and you're looking to ... there's muscles ... if we go back to muscle slide, thank you. Yeah, is that on the screen? There we go.

SB: You got the hang of that tweaker!

DT: So, obviously there's muscles that are over lengthened and there's muscles that are shortened. So, if we're not looking at bracing, we can make improvement if they work hard enough by putting them in the opposite position. But, it's three dimensional, so we're not just looking at laterally shifting them. We're looking at de-rotation, as well. So there is a specific technique. But, if they're braced, I'm looking at just making normalizing their posture, and once their posture is normalized out of the brace, and then I don't need to see them till they come out onto more part-time bracing. And Schroth, itself, has four rounds of mass-controlled trials. That's not comparable to anything else for scoliosis. It's been proven that it works. I'm not just about posture. I'm not just about Cobb angle, but about respiratory, about a lot of different signs and symptoms.

SB: Of course, there are CTs and RCTs. These are good quality RCTs.

DT: Recent, yeah.

SB: Yeah. Which is something which is sadly lacking in many other aspects of what we do.

JA: It's gold dust. My question about this, because I'm sure that there are osteopaths and chiropractors out there that identify with everything that you've said, and I know we're sitting on the sofa and there isn't a facility for you to show us, but what exactly are you doing? What are you teaching them to do for themself?

DT: I have to give them some advice on ... You have to draw their attention to their appearance because ... It's a difficult thing for a girl to understand that they're not perfect. And I always say, "I think you're perfect," you know? However, I have to, you know-

SB: Sorry to interrupt you there. It's not a difficult thing for them to understand, surely. Are there so many young women and young men assume they're not perfect and they're hideously embarrassed by it.

DT: Some people are, yeah.

SB: And if you've got ... I mean, standing like that, that is relatively minor, but you've got some other people with much more obvious pronounced curves. I would imagine that a young girl could be really mortified at the idea of I don't like doing gym at school because she's got a spine that's not the same shape as anyone else's.

DT: Exactly. Yeah. But you can make a big difference appearance just with the exercise alone, but you've got to work hard. Usually for intense period of around three months, you can go from looking quite severe to looking ... If you know, you would know it, but-

JA: Three months?

DT: Three months, an hour a day.

JA: Wow.

DT: Yeah.

JA: That's an incredibly easy thing to tell a patient. I'm just thinking in my clinical situation, my patients will ask me difficult things to have ... If I said 18 months, I think most of them would switch off and go back to Googling through the things that they shouldn't be looking at. But, that's incredible. But is that only because they're in the middle of their adolescence and they've still got.

DT: They're more flexible.

JA: They're more flexible and still got growth available?

DT: Yes, but even the older adults can improve that overall balance. They may not be able to get a normalized rotation, because obviously the rib cage is deformed, as well. But, they're usually pleased with the pelvis position, for example, the shoulder position when they're improved on.

DT: That becomes more natural to them-

JA: I can absolutely understand why we spend our time looking at exactly those asymmetries and the likely more severe, women are certainly better at spotting them than men, girls better than boys. I can see why that might be a motivation, but I also understand it clinically as being a significant kind of peripheral indicator of the end of the lever where the shoulders or the pelvis are. That's exciting.

DT: Yeah.

JA: That's much less than I thought.

SB: So Debbie, what's going on in this picture here? Because that young lady there is presumably carrying out an exercise that has been prescribed by her ... according to the Schroth protocol.

DT: Yeah.

SB: But that's not a piece of equipment that most people have at home, so she's got to do this at school, or ...

DT: So, we do actually teach them to do it in doorways. I know it looks a bit strange. You can adapt the arm position. So we tend to reduce. There is an old Schroth, so the old German Schroth when you're looking at very big curves, then you would go back to the wall bars. But obviously in the clinic, we have wall bars. So when we first see them, I want to see them with the wall bars to see what we can and can't do. But, if the curve is smaller, then you can definitely use doorways and chairs instead. In the 1920s, they didn't have wall bars. A lot of it was done in just in outdoors with chairs and poles. So that's where it originated from. You can adapt it to a home program.

SB: For somebody like this young lady here, is this the sort of curve that you would expect to reduce, resolve within the few months that you mentioned earlier on?

DT: Yeah, the thoracic curves are quite quick, but as far as the Cobb angle's concerned, it is difficult if they're going through a growth spurt, and they're over that 20, 25-degree angle, the brace is definitely something that I have to

recommend because in the past, patients have avoided it, didn't want to frighten their child. But actually, it's got worse. And, "I haven't got magic hands," is what I say. But Sally, I mean, the results that we get together with the brace, they can look almost normal within three to six weeks, so it's a lot quicker.

SH: Because the brace is doing the same thing as the exercises. We're trying to achieve the same posture.

SB: I imagine we'll have a look at some of your braces since we're talking about those. Would you like to describe the props that you brought with you this evening, Sally?

SH: I will give it a go, yeah.

SB: Here, I'll take that from you for a minute.

SH: I wonder if there's a ...

SB: Yep, there is a slide.

SH: ... a good slide, as well.

SB: I'll bring that up.

SH: Okay. Okay, so this is a Gensingen brace or Gensingen brace, depending on how you pronounce it. So the idea of the brace is to put a child into an asymmetric posture. The old historically braces that have been used in the UK, conservative treatments, are very cylindrical, for example, this one on the left. Boston is a term that's used-

SB: That's not the same brace. That's not a Gensingen.

SH: No. This is a kind of old ... Well, it's not old. If you were in the the NHS or most places in the UK use this style of bracing.

JA: It's the traditional ones that most people would assume.

SH: It's the traditional ones that, yeah.

SB: So we're trying to force a bent spine into a straight position, essentially.

SH: Yes.

SB: Two dimensionally.

SH: Yeah. And what you can hope to achieve with that is to control the curve and stop progression, at best, that's a kind of really positive outcome. What we're

trying to do with this is kind of harness the, sort of, principles of the Schroth technique in a brace. So, the brace is over corrective and asymmetrical.

JA: So, it's actively pushing against-

SH: Pushing...

JA: Their asymmetry.

SH: Yeah, so...

JA: In three planes.

SH: This. Yes, exactly. And so, Boston braces don't deal with the sagittal plane.

JA: Yes.

SH: And unfortunately there's a lot of flat back deformity after that type of bracing. This brace works, it doesn't do anything to the sagittal plane other than help allow it to-

JA: Maintain.

SB: May I have just a quick sort of-

SH: Yeah, absolutely.

SB: That's absolutely rigid. That's solid.

SH: It is. Yeah.

SB: There's no, is that comfortable to wear for a young child?

SH: The forces required to apply a significant correction to the spine are very high.

SB: Yes.

SH: So, but what's good about this type of brace, I mean, if you look at it from the top, it looks very obscure in its shape.

SB: Right, so. You'll orientate us to this, the straps are at the side?

SH: So this... Yeah. So the straps are at the front.

SB: The front.

DT: Unlike the Boston.

SH: So, if I go to the back, so this is a brace for somebody that has a right thoracic curve.

SB: So, actually it's the same as this one here.

SH: It is, yeah.

SB: Yeah.

SH: So, this correction here is to correct the thoracic curve, the main apex of the curve. But what you've got over here is a large space. So, at the beginning of the treatment you can put your hand within that space. So, there's a lot of space within the brace, because we're trying to shift that entire thoracic block. So, that bit there, we're trying to shift it, not just to midline, but actually over to the left as well. So, you get a significant correction.

JA: So, it's not like being squeezed into a tube.

SH: Exactly.

JA: It's being put into a custom shape.

SH: Yeah.

JA: With space to be pushed into.

SH: Space to be pushed into.

JA: I understand.

SH: So, because obviously the thoracic, somebody with scoliosis, with a right-sided thoracic scoliosis...

JA: And by that you mean that is.

SH: Is not shaped like that.

JA: That's on the outside of a lateral curve?

SH: Yes.

JA: Thank you.

SH: Yeah.

SB: Okay.

SH: With a thoracic curve, you have to open up the top, so that's what this strange piece is here, which goes up right underneath the arm and creates an asymmetrical shoulder posture.

SB: Yes.

SH: But you have to do that in order to open up the thoracic curve and...

DT: And offload the bones.

SH: And offload the bones. Exactly.

SB: Right. We've got a whole load of questions, which have come in from our audience.

SH: Okay.

SB: So, I don't know whether these will follow on from what you've just said or not, but can I ask a few of these before we move on to your catwalk brace down there, which I'll explain in a second. Well, it's an interesting one. Do you know the longterm effectiveness of the exercises as taught by the scoliosis SOS clinic in London? Are you aware of them? I don't know what they teach.

DT: I don't...

SB: And would you recommend attending the clinic for young scoliotic patients?

DT: From what I understand about them they do different non-specific scoliosis exercises. So, things that I, as far as I know, aren't evidence-based. So I couldn't comment further, but I don't know...

SB: It's an unfair question, isn't it? Because it's asking somebody who's...

DT: It is, because I don't know where they're trained or where their physios have been to. So, it's a difficult one to comment on a different clinic. It sounds...

SB: And Dawn has asked us, I mean you mentioned the studies, the RCTs, which have gone into the Schroth method. She's asked, "are there long term studies that show improvements in quality of life with diligent exercise versus sort of diligent exercise practice for scoliosis?"

DT: I think the long term studies, there's no kind of tenure long term studies, but the RCTs have booked two years, or longer, follow ups and that they could-

SB: And are those RCTs looking purely at changing Cobb angles or are they looking at quality of life? In other words, in respect.

DT: Quality of life. They use a questionnaire developed by the sclerosis society. Yeah.

SB: Yeah. How does it affect people? Sorry, I mean, what is the impact on quality of life for somebody with curves like we've seen in some pictures?

DT: The signs and symptoms. Yeah, so it affects their breathing. If the thoracic curve is big enough. If they're over 40 degrees, and it can progress over their lifetime, so you're trying to get it down as much as possible. They can go on to have self-image issues, they can have pain. Not all of them develop pain as a young person, but obviously as they get older and things can become degenerative.

SH: Yes, we are starting to see what they do, get some pain and they've been to see an orthopedic consultant and they've been told that if it progresses they need an operation. So, they come out, set them up with that appointment, looking for alternative.

SB: Generally, do you find that orthopedic consultants are programmed to say you need an operation? Or are they aware that there are alternatives? There are braces, there are exercises, which can be used as a preferential treatment before you get to the stage you're cutting people's spines apart?

SH: Historically in the UK, the conservative management of scoliosis has been poor. We'll hop back to this slide here, with these braces, can hold progression of a curve or simply allowed it to progress within the brace.

SB: But at least it's not a, what are they called, Barrington rods, or something isn't it?

SH: Barrington Rods.

SB: At least it's conservative.

SH: Yeah. So, often they are prescribed, as a bit of a stop gap really, until surgery.

SB: Right.

SH: So, obviously nowadays, with Google, patients take their care into their hands, don't they? And they're looking for alternatives and...

SB: Yeah. Somebody else, sorry, I thought you finished.

SH: I have.

SB: Feel free to interrupt me. And somebody picked me up on the netball comments earlier on her, because there's actually netball, like most sports, is

one sided and can that aggravate the problems that people experience from-?

DT: In general, you're looking at extension sport, so anything where they're running around, and strengthen their extension arms above head, is brilliant.

SB: Yes.

DT: Yes, there's tennis, that, again, it's asymmetrical, but they're getting a lot of benefit from running around and being extension. Sitting sports sports aren't so good, trampoline is terrible because you've got that force from underneath.

SB: Yeah.

DT: And that coil in the middle is just getting more compressed with the gravity and the underneath.

SB: I've got a long observation, which might turn into a question when I get to the end of it. I'm not sure here, but whoever has sent this in has decided to remain anonymous. Feel free to tell us who you are. It's great fun to know who's asking these questions. "In the UK, there's a policy of watchful waiting within the NHS, when a scoliosis is first identified by a GP. I find this the wrong approach, is we've had good results treating idiopathic scoliosis with a combination of chiropractic and myofascial release techniques, along with utilizing the Schroth techniques. The best results, seem to us, when they started as early as possible, and involve them spending a lot of effort to teach the patient the correct exercises to do so they can do on a daily basis. The best results they've had was with a 12-year-old boy with Arnold-Chiari malformation, and syringomyelia, who's now 19 and has complete control of his condition, and we just monitor him." Does that ring bells with you? Does that sound like something you've?

DT: It's a non-idiopathic case, so unfortunately, non-idiopathic cases, there's not so much research upon.

SB: Right.

DT: So.

SB: Perhaps, we didn't actually cover that, I mean, as I understand it,, there are three different, well there were lots of classifications of scoliosis, aren't there? But there's idiopathic, there's congenital, which we touched on earlier on, and there's neuromuscular. And you're saying the best, the most of them are idiopathic?

DT: 80%, yeah.

SB: 80%. And so-

JA: So, you see a lot of-

DT: Overall, yeah.

SB: Right. And is your approach different to something, which may be near neuromuscular?

DT: Because there's less research.

SB: Yes.

DT: So, depending on how much experience you've had with that condition, you're not going to give them the expectation possibly of improving. You're going to give them expectation of, "look, you're not an idiopathic case. We're happy to try, we're likely might be able to hold this if..." And the thing is, it can be, there's not just those two conditions. There's lots of different things that can cause scoliosis. So, you don't really know what you're dealing with sometimes. So, you can't give them the same expectations, but we were more than happy to help, normally, depending upon the tolerance of the patient and all of those are the things that Sally had mentioned earlier.

SH: So, we can see, I mean we can still treat, but yeah, our outcomes are slightly different.

JA: In your experience is it more similar than different?

DT: I guess, yeah, you try and see if the same things work.

JA: And do they? Theoretically.

DT: We've managed to hold curves that have been non-idiopathic, yes.

JA: Yes. Okay.

SH: Yeah, neuromuscular curves are tricky because they...

JA: They're behaving from a different place, yeah.

SH: Have their own rules, yeah. And they're unpredictable. But prior to this type of bracing, we would be using more of a bivalve, a TLSA, a plastic jacket with very unknown results.

JA: Yes.

SH: With this-

JA: So, it's an advancement anyway.

SH: It's a, yeah, exactly.

JA: There is a better technique for neuromuscular scoliosis and therefore they should be using it.

SH: Yeah.

JA: Is there, do you, I don't know how other than just following a normal protocol, you would assess whether you are going in the right direction with them, but I guess you said-

SB: Well, actually, that preempts one of the questions that's in here, which said, how do you assess the success of the intervention, whether it be brace or exercise? Is it another radiological examination of cobb angles or,

DT: Yeah, we do that, but if, it's lots of outcome measures actually.

SH: Yeah, we have, so these patients are in a very dynamic style, concentrating on the bracing for a moment, they're in a very dynamic style of bracing, and frequent monitoring is an absolute. So, we see them every, start off with, we see them two months into the start of their treatment, and then every three months because as they're growing, things are changing. We need to change what the brace is doing as the increase in height, and as their posture changes. If we reduce the assymetry and the posture, then we have to reduce what the brace is doing and-

SB: Ah, and that preempts another question, which is all these things generic or are they bespoke to the individual?

SH: No, they're bespoke to the individuals. So we use, so this system, we use CAD design, but we use 3D photographic imagery to actually get the, what we make the brace from.

SB: Dare I ask what they typically cost the patient?

SH: So the treatment, which includes the brace and the clinical fees, for myself and Deborah's input as well. So we offer a treatment package, which is £3,100.

SB: Okay.

SH: So, there's multiple-

JA: Can that be covered by insurance?

SH: Yeah. Some UK insurance companies pay, others do not.

JA: I don't know if I'm allowed to ask which ones, but maybe we'll talk about that afterwards.

SB: Well, why not? There's no reason why we shouldn't ask which insurance cover it.

SH: So, Bupa.

SB: Yeah.

JA: They do?

SH: Cigna. Cigna, yeah.

JA: Good.

SB: And they'll cap your fee at £25 instead of 3,100 cause that's-

DT: They try to. I guess we also offer group sessions on weekends with the girls and boys so they can get together, and I can say if people need more therapy, I can provide it then as well. So, we try and cover what we need to for the patient really.

SH: Yeah.

SB: One of the questions that, this fascinates me, someone's asked, would you have to continue your exercise therapy after you've seen a satisfactory reduction in Cobb angle, your outcome measures had been achieved, or having got there. Is that it? Is it going to stay put now?

DT: If their posture is normal, their rotations in normal ranges because there is normal ranges of rotation, if their pelvis is beneath their head.

SB: Yes.

DT: And there's no particular, if they've got a normalized posture, without posing, why am I treating them? Unless they've got pain, maybe I could-

SB: No, it wasn't the treating, it's if should they continue with the exercise?

DT: No, absolutely not, yeah. So once I've done my job.

SH: There is an end of the treatment sort of protocol that actually, three years in, we're really sort of forming. And there is a weaning process from both brace and exercises. So we are happy, and we take a cautious approach, so we're not discharging these patients too early on. So, we monitor when they've come out of brace, we monitor them three months later.

DT: Check their posture.

SH: And perhaps reduced their exercise program. So, they're getting on with their life and going off to college, and making sure that everything is stable.

SB: Matthew Davies has sent in a question, thanks Matthew. Matthew is one of our regular questioners, which is great. His daughter is now 22, and has recently had her a Cobb angle measured at 44 degrees. This has reduced from what it was previously. She wore a brace from ages 12 to 13, it doesn't tell us which sort of brace. Is there anything he could suggest to help her now? He says her scoliosis is thoracolumbar.

DT: I guess it would depends on patient.

SH: Yeah. I mean, does she have any pain? Really with adults, she's 22, did you say?

SB: 22, yeah.

SH: So, from my point of view, adult bracing is required in a part-time basis to treat pain and reduce asymmetrical posture. I think you perhaps you would-

DT: I would do something similar. So, normally I would see that patient first, and if they felt, I really would like to try a brace. Because you can get more of an improvement quicker in a brace, not with the Cobb angle inside the adult, but with the appearance.

SB: Right.

DT: But some of them are happy to do the intensive therapy, or they have to wear brace, as a part-time option.

JA: How acute is 44 degrees?

DT: Acute?

JA: Serious.

SB: Significant.

DT: Serious, yeah. So, anything over 40 degrees can continue to progress in your adult life if you do nothing.

JA: Yes.

DT: Less than 25 degrees, if they're finished growing, it's very unlikely it's having a big impact on your life at all. But it depends on your sagittal profile, but they would do without scoliosis, would it not? You know, if you ended up with-

SH: And it's holistic thing, isn't it? We're not just treating a Cobb angle, we're seeing what impact that's having on the patient and thoracolumbar curves can be quite progressive. So.

DT: Yeah, a tricky situation.

SH: Yeah.

DT: Like all things, it's important that we have the right outcome measures here, or the right measures of serious significance, isn't it? It's not the angle that matters. It's it affects your life. The signs and symptoms, yeah.

SB: Okay. Matthew, if you want to send us any more information about your daughter, then perhaps we can get into some more details about that. But it would be interesting to know which sort of brace he actually wore from 12 to 13 perhaps. Somebody says £3,000 over what period of time? Is that upfront?

SH: Within the first month It is, yeah. And over what time they need treating depends on how much growth they've got left.

SB: Typically?

SH: So, because of height, so, one brace is not going to last somebody from the age of one growth from the age of nine, to 16. So, one brace may only last 12 months.

SB: Right. But in the period that they've paid their £3,100, they get as many of these things as they need during that period.

SH: No, they get one of these.

SB: They get one of those?

SH: They get one of these, and all the clinical support.

DT: As much as they need.

SH: Because it's physio, it's reviewing the brace and making adjustments, and it's the group sessions with the other, so, they've got group support from other teenagers going through the same thing. It's the...

JA: It's a package.

SH: It's the kind of the counseling that we provide, and it's an emotional, yeah, difficulty.

JA: I wanted to ask about that. This is exactly as you say, it's not the Cobb angle, it's the person who happens to have that as one of the symptoms, maybe associated with a fundamental design. But these are kids, and or young adults, and as much as we are not a psychological therapist, it is an intrinsic part, I assume.

DT: 50%.

SH: Yeah.

JA: Yeah. It's good to hear you say that. It's, and I like the idea of a weekend kind of get togethers, it's an encouragement. You're offering hope, and you have measure of success, at which you draw lines. Do you find conflicts? Do you have any conflicts where the patient wants to continue, but you know that clinically, to continue at that level, is not going to be very successful. Do you have many of those conversations?

DT: Well, we set the expectations in the first place that we-

SH: Yeah, I think we undertake. I don't think there's many instances where the treatment isn't all kind of agreed at the beginning before moving forward.

JA: That leads, I understand that, I've done that many times in different situations. My question would be is there anything after your process?

DT: I mean, during the process we give them a lot of, we offer face to face time, we offer constant email, especially when they're weaning in and stuff, we're trying to provide as much support as we can. Do you mean after? It would depend on their symptoms afterwards. Do you mean when they're an adult, or?

JA: Yes.

DT: Yeah, so sometimes I see patients, we do random times. Sometimes I see patients when they're, for example, if they're having children, things can worsen then because of all the hormones, et cetera. So, sometimes I'll see patients at that time of life as well, and obviously they come back to me because the last thing they're thinking about is that posture when you have a baby.

JA: Yes, of course.

SB: I have a question from Hannah, which is, I mean, it really is an interesting little case that she's described here. She says she saw a friend's daughter recently, and the mother was concerned because the daughters shoulders were uneven, left shoulder rotated anteriorly. And she has a significant 'S' shaped scoliosis with rights rotation in the mid-thoracics. She high jumps, and she does ballet seriously. She's 14, 15 years old and started her periods this

year, but she's still growing. And her appointment with an orthopedic consultant isn't until November, which it is now, I guess, well, nearly now. She's conscience that time's running out in terms of how much growing time she has left. So, what would you suggest is the proper course of action for a girl in that position?

DT: Come and see us. Yeah.

SB: Hannah, I don't know where you're based, so London may be out of the question, but you would say it is worth being that straight away rather than waiting for the orthopedic appointment?

DT: Probably, if it's really obvious. Usually, when the period starts, you're looking at around 18 months worth of growth, so you're not, and it's not going to be a quick spurt because usually they do that leading up to the period.

SB: Yes. Someone else-

SH: Also, whilst they're waiting to see the consultant, which is obviously a very important part of the process, there's no harm in getting in contact with us and seeing, I mean, it wouldn't be this until the consultant is, we need an X-ray, but in terms of input from Debs, in terms of posture and activities of daily living, that might. Because when you've got this sort of diagnosis, you want to take action.

SB: Particularly, if time is running out to make sure this can be corrected, or as corrected as possible, what about those activities? Ballet and high jumping, are those going to...

DT: If they love it. If they love it, I can't stop them doing, I don't want it to stop from doing it. However, it's trying to manage that, and it's trying to say, "okay, do you need to be doing a less of a high level competitive states," and we have had a lot of that. It's trying to avoid that, really maintaining that hyperextension. The thoracic region, in particular, can be quite detrimental in a way. Yeah. So, I kind of balanced that against doing some exercises, wearing the brace, as long as only doing it for one to two hours a day and they can wear a brace, and do my exercises on other days. It's not a massive problem.

JA: Do you feel you can at least help to mitigate the effect of their chosen of activities?

DT: Yeah. Yeah, exactly.

SH: Yeah. Because their question often in the consultation is I really love this, can I still do this?

JA: Yeah.

SH: And actually, in terms of the brace wear, it's in the first six months, particularly, it is full time. But full time apart from sport.

JA: Oh. So you can take it off, and you can do, even if it's a slightly detrimental activity, and then put this back on.

SH: Exactly. Yeah, exactly.

SB: It's a common problem in practice, isn't it? In getting people to comply with exercises, I mean, as physios, we all know that. I imagine that it's better here, but you have any feedback on compliance rate for wearing braces correctly, and for doing the exercises that you prescribed?

SH: Well, I mean the younger patient group. So...

DT: The juveniles.

SH: The juvenile patient group, fantastic compliance.

SB: Is that because parents who've spent 3,100 quid on them? Bloody, we're going to do the exercises whether you like it or not.

SH: In terms of wearing the brace, it's a novelty, it's fun. They're not so self aware of themselves, even in the younger adolescent group and that's where you see the skeletal image, or you see results very quickly. They have good outcome measures early on, so everyone's very well motivated. And parents still have good control over their children, but when they hit 14 it's really hard, and that's when we lose a little bit of compliance. But if they've been in bracing for two years already, they don't need to be wearing the brace full time. They can be wearing it at night only by then, because we've already reduced the Cobb angle. We've improved the symmetry and it's just a maintaining thing.

SB: So, someone is going to wear this in bed?

SH: Yes.

SB: Crikey. That must be very uncomfortable, is it?

DT: The human body changes… but the human body does changed shape quite well. It does take time.

JA: Particularly in the young and flexible.

SH: Yes. Flexible, absolutely. That's a big thing.

SB: Somebody else who sent in a question is, do they wear the brace for all waking hours? We've just answered that, because you can wear it at night as well.

SH: Yeah.

SB: But you said not for sports, another exercise.

SH: Not for sport or washing.

SB: Right. And I interrupted, we diverged a little bit earlier on, and we didn't get to talk about the leopard skin catwalk brace that you've also brought in here. So, tell us what the difference is, what's this one all about?

SH: So, this is a slightly different curve pattern, but this brace was designed for a very large curve.

SB: Which picture are we looking at right now? This is-

SH: So, that's the back of the brace, again, that's the front. A very, very big curve into the 90s.

SB: Yeah.

SH: So...

JA: Sorry, 90 degrees?

SH: 90 degrees. Cobb angle, yeah. So, there's a lot more plastic in this one, but it was designed for a nine-year-old boy.

SB: Sorry, I need to get this in my head. Your patient, that is the front of the brace. So, the patient would actually have been bent that way, and you're trying to push them the other way with this, which is-

SH: So, this patient has a very severe right thoracic curve with a marked pelvic shift to the left.

SB: Yeah.

SH: So, that is the main thoracic correction, whether, if you're looking at it as a three point pressure, you've got a correction here, and your lever arm is here, and down here as well.

SB: Are there any detriment, any adverse side effects of this because that must be putting a lot of force up under the ribs as it's attempting to make that correction.

SH: But because you're dealing with flexibility, and you've got all this space over the other side where, we are moving the whole trunk, but it's got those, they can breathe completely well in the brace and....

SB: Yeah.

SH: So, I mean people wear these, they do wear them comfortably for, the beginning is not comfortable, the first week or so is quite hard, but no, it doesn't affect them in the long term.

SB: And can I get different patterns if I want to? I don't have to have leopard skin?

SH: Yeah, you can have leopard skin, or not. So, a lot of teenage girls, choose white because it goes in with their school shirts.

DT: Or pink?

SH: Or pink.

DT: Pink's pretty popular.

SH: Yeah.

SB: Right. Okay. Matthew's come back to us, and he says that his daughter, the 22-year-old we were talking about, remember? She wore a Boston brace and was assessed, but not otherwise treated at the Royal National Orthopedic Hospital, which is in Stanmore, isn't it?

SH: Mm-hmm.

SB: "There was considerable pressure to commit to surgery after she was fully grown. She found the brace hot and uncomfortable, but she was good at wearing it. And when she was asked to, she's now 5'9", and manages very well, although she does experience pain and fatigue. She manages it herself really well with Pilates classes and osteopathic treatment, of course, and she has no pain at all. She had no pain at all last year at University in Texas, possibly due to the climate, he says. She isn't sporty, but sees the benefit of core stability and enjoys yoga." That's all.

DT: Yep.

SB: Sort of the pattern that you would expect?

DT: Yeah.

SB: Okay. Right, well-

SH: We do see a lot of patients who have come from some, or we have a good relationship with the orthopedic consultants, actually.

SB: Yeah.

SH: It's obviously very special a center.

SB: Okay. Someone else, if an adult has a greater than 40 degree Cobb angle, and hasn't had a brace or surgery, what's the chances of them making progress with just through exercise?

DT: Well, obviously you're looking at testing that flexibility first, talking about what's their main, what do they want from treatment? If they want reduction in Cobb angle , that's really unlikely. But we can stop it getting any worse, and it is more about bare effort that they need to put in, and our education, and our support.

SH: Often adults, or perhaps some people that have had scoliosis for a long period of time, are quite aware. There's often one thing that really bugs them. That hips sticking out, or their shoulders, so we can try and improve their posture, but there would be no improvement on a x-ray, for example.

SB: Okay. Somewhere in the questions that came in ages ago, somebody else, if you ever treat scoliosis as a result of a leg length inequality, I mean would you say, well, let's just try heel lifts or orthotic foot orthotics to correct scoliosis?

SH: As part of the assessment we are looking at, we're looking at their spine, but we're looking at their pelvis, and their lower limbs as well. It's obviously something, like doing foot orthotics that you're looking at anyway, you're looking up to the pelvis.

SB: Yeah.

SH: And often with those lumbar curves, they've got an asymmetry to their pelvis. They have one hip, if it's slightly more abduct than the other, they've got more internal tibial rotation as a result of that. So, sometimes it could be a heel lift, or actually improving their foot mechanics, from down below.

SB: Yeah.

SH: So, often some of our patients that are in Schroth treatment and, or brace treatment are having a heel lift as well anyway, to reduce the pelvic rotation.

SB: Yeah.

DT: Sometimes you wait until they're finished, then, they should stage the bracing, because sometimes you're kind of competing.

SH: But when we're looking at the rotation of the spine, doing in a forward lean position, the first thing you need to do is to make sure the pelvis is not rotated. So, we pick that up very quickly.

SB: Right. Somebody did ask for clarification on that, so if I can just find that question. I don't know who, as I said, they're still a little confused by our earlier discussion. Did they understand it correctly that there are risks in ballet dancers and other activities that involve spinal forward bending in acquiring a scoliosis? Or is it only a risk for those that have an early sign of scoliosis already?

DT: I don't think that ballet causes scoliosis, but I do think, and it's not forward bending, it's arching forward of the thoracic spine pattern.

SB: But you said reaching, your hand extension-

DT: These are good. Yeah.

JA: Difference between activation and postural position.

DT: Yes.

JA: Thank you, Jono.

DT: Thank you. So, if you're constantly forcing the spine into an arch position, this tends to be unstabilizing the spine. So, not everybody does ballet will develop scoliosis, it's just, it's one of those things that I wouldn't necessarily choose if my child, if I had had scoliosis, I have a child that could develop scoliosis. But if they love it, you can't stop them doing it and we wouldn't want to.

JA: We're all agreed, trampolining is off the menu.

SH: And in terms of actually treating adults, but also in good habits for children, the sagittal plane and the making sure they have a good lumbar lordosis, is really key to stability. And sometimes those patients, the adults who have a scoliosis, it's really focusing on the sagittal plane and making sure the not, well, overarching, or for example, cycling leaning forward.

JA: So you mean either extreme of a significant flattening of the lumbar spine would be something that you specifically work on to reduce?

SH: Yeah, that's an unstable spine-

JA: And in exaggerated lumbar lordosis you would also see as just the other end of that spectrum it needs to be more stable by being more appropriately checked.

DT: So you would assess that if there's an issue on the sagittal plane that would normally correlate with pain.

SB: We talked about the classifications of scoliosis earlier on. Someone has asked how we could know which type of scoliosis it is and I suppose the follow up for that is how important is it to know which type of scoliosis it is.

SH: In terms of the curve pattern?

SB: No, I think they're referring to whether it's idiopathic, congenital, neuromuscular.

DT: You have to go and see a surgeon to get that diagnosis. You need an MRI if you think that it's not an idiopathic case, but they would do that as part of their assessment in the consultant anyway. But there are some curves that are less likely to be idiopathic than others-

SH: But if there is a congenital deformity, then we obviously would need to know that in order to treat it properly. So in your-

SB: Which should come out in your clinical questioning, shouldn't it?

SH: Yes. But if there is no recent x-ray for example then, you know, you have to proceed with caution. So there needs to be some relevant imaging.

SB: Proceed with caution because?

SH: Because you need to know what you're treating in terms of what the position of the vertebra... if there is any wedging or fusion for example, any previous surgery that has been forgotten about during a discussion.

SB: Okay. Somebody actually asked here if you've ever heard of idiopathic scoliosis being caused by emotional shock. I don't know why they've asked that question.

DT: It does exist. It does exist. Trauma, psychological stress. Because they hold themselves in a bad position and if you stay in a bad position the loading when you're growing, the loading can happen. It's one of the non-idiopathic lists but there's lots, there's many on there.

SB: Just I'm struggling to work out how I would identify that. I mean that almost sounds to me as though you need sort of regressive counseling or hypno-therapies on where's this shock that might've put you into this position? And then is there a talking therapy role in getting them out of that position as well?

DT: Yeah, you can't separate the body in the mind and sometimes you have to go through the minds to improve. So yeah, I would say you could try that.

SB: Another case history for you, I don't know who is asked, but they have a 12 year old patient with a lateral scoliosis in the cervico-dorsal region, unusual location, but possibly caused due to adaptation needed from neonatal care. Can you model a brace for that area?

SH: It is a hard part of the spine to correct with bracing because you don't have much above that to... You need to lever arm above and you can't really go beyond the axilla. So it would be interesting to see what the X-ray shows-

DT: And if there was a compensation curve that you could use to improve above.

SH: And what their head positioned relative to their pelvis is for example. So-

SB: And I'm guessing somebody might be saying, well, would you potentially incorporate a neck brace to put the cervical spine back into a position that you'd like? I mean, most of us hate neck braces, but-

DT: It makes it very interesting. It makes it very stiff. You should really not stop the spine, the neck from moving.

JA: And it's not really dealing with the lower causation.

DT: Yeah exactly.

JA: It's a strange isolation.

SH: It's a curious one. I'm unsure actually. I'd like to see-

DT: We'll look at posture. The neck, really more than anything.

SB: Graeme in Devon says, "It's interesting how we will consider this level of dental involvement, but not for spinal issues like this."

SB: The NHS is still applying 1970s techniques in this area of medicine. It should be subsidized by the powers.

DT: When we fit the brace, sometimes if they're wearing a brace, we'll kind of explain that. That's going to be uncomfortable to start with. Just like when you started bracing your teeth.

SB: In an ideal world, you know, the NHS will pay for everything, but I suppose there's no point in his arguing. You should be paying £3,100 for patients in situations like this because he hasn't got any money basically.

SH: I have worked in NHS orthotic practice and I have worked in scoliosis clinics in orthotic practice and you just simply don't have enough time to provide this kind of treatment effectively. You get 20 minutes and you need a lot more time. Our patients that are with us for quite a long while.

DT: Yeah, we like to make sure we give them as much as we can.

SB: Have you ever heard of a theraflex machine, previously called Pam apparently? Someone who's asked this question says they used to work with an osteopath who treated patients presumably with a theraflex machine and he found it very effective.

DT: No.

SB: Well I don't know who asked, but if you can give us some more details about the theraflex machine and it would be great-

SH: Google I think-

SB: Somebody out there will Google it. Matthew will Google it for us, I'm sure. What else have we got here. "My daughter has slight pectus excavatum which causes periodic pain. Could it be caused by scoliosis?"

DT: Yeah well we also deal with pectus at LSE. So we deal with excavatum, carinatum rib flaring and we brace for that as well. Obviously differently-

SH: Yeah that's our specialty isn't it.

DT: And I would say, and I've looked this up, about 30% of them have scoliosis as well. So they have the rib cage deformity.

SB: Do you think one or other causes the other problem or is it just that-

DT: It's chicken and egg again, isn't it?

JA: 70% of rib deformity can be without scoliosis?

DT: Yes.

SB: Robin wants to know if you ever use 'direct manual therapy', all in inverted commas, in combination with exercises and bracing and do you see a place for it within the treatment spectrum?

DT: It is used if they feel, it depends. Sometimes especially the patient is struggling with a brace and it is recommended as part of the Schroth best practice. Especially if they're struggling with a stiffness in the thoracolumbar region. That's, you know, stubborn and not being able to do more-

JA: And you get hands on and, you know, help it?

DT: Yeah but I mean I'd always try the exercises first because I always find that if we can move our bodies the most. And there's obviously when you're doing the exercises, there is hands-on facilitation of rotational breathing, so we're

trying to direct the breathing into these like, the same as the braces, into the voids. So we do use our hands a lot, but actually once the patient knows that movement and you're trying to teach them that movement themselves, they can normally do it.

SH: They are so effective. When you're fitting one of these braces onto a patient to start with, you are essentially trying to put them in a complete opposite position. Then you're mirroring the curve so that when it first goes on it can look and feel incredibly bizarre. If they've then done a bit, sort of half an hour of Schroth therapy with Debs, during the fitting, suddenly the whole thing works a lot better. It fits a lot better. It's much more comfortable. So the exercises do have a... it does work very well.

SB: Yeah. You see Dawn has now come back to me and she sent her a question in before we went on air about what do they do at the London SOS clinic, you know with scoliosis, that sort of thing? And she's actually practiced Schroth technique there as well but obviously she sent her question in before she'd heard us talk. Just for reference, do you feel as though the benefit is the combined approach of the brace, the exercises and the orthotic support altogether? So what else have we got?

What do you think the underlying cause of juvenile scoliosis is? Do you think it comes from muscular shortness or shape of the vertebrae? Shortness in the ligaments of the spine. Just asking for thoughts as this person has seen so many of them.

DT: If we all knew that, I think, we'd know then how to change it a lot better than the... That's the million dollar question. There are different theories out there. There're theories about, you know, the spinal cord tethering. There are all sorts, and some of them have been proven to an extent and so-

JA: So there may be a lot of them. Do you see different patterns that you think may be more joint function or neural tethering in origin, or elongation issues on one side primarily rather than any of the others?

DT: It's difficult isn't it? I mean you try do a really good subjective assessment, but the patient doesn't know what you're looking for either, so it can be quite difficult to get a full background.

JA: And you're never looking at it at the beginning anyway. It's got a history that brings everything else in.

SH: When we did put-

SB: I'd love to see what the picture was about-

SH: Oh yeah that one up there? When we do see patients, these are the common classifications that we are seeing and-

SB: Is this is just the natural classification or does everybody used these classifications.

DT: That's Katrina Schroth. That's her original one. This is her grandson actually. He designs each brace.

JA: Still?

DT: Yes.

JA: Her grandson, sorry.

DT: Yeah sorry, not 1920s. So he's tried to develop the brace in order to let these patients have their life back a little bit. So the Schroth best practice program is actually for the braced patients to kind of get the important, the posture back, but not take over their lives. So some old original Schroth you'll been doing it for many hours a day, eight hours a day.

SB: These classifications that we've got here, 3CH, 3CGO, 3C, and all that sort of stuff. What do they mean? Are they just telling you the practitioner where the apex of the curve is?

SH: Yeah, absolutely. So whether it's primarily a thoracic curve or a lumbar curve or both. So we can posturally classify a patient without seeing their x-ray. The x-ray is compounds that. To tell them what kind of exercises they're going to need and what shape the brace will be as well, in terms of the type. This is the sort of standardized element of the design. So there are many types of scoliosis out there and many different classifications, but these are the common types that we are seeing in idiopathic cases and we are trying to standardize the treatment in order to improve outcomes and gain that evidence that we are so lacking in, in terms of bracing as well.

DT: There're many types of braces with voids in them and it's kind of based on Cheneau. He was a French guy who realized that we can move away from the Boston and create gaps and creating these gaps made better improvements. But this classification is what makes the Gensingen a Cheneau. It is a Cheneau brace. Is what kind of standardizes it. Whereas on one of the trials that were all based on different types of Cheneau and there's no definite pictures or classification of what they're using. So it's not really repeatable. Whereas the Gensingen is-

SB: I'm glad you brought this up because this diagram fascinated me when I saw your presentation pictures.

SH: So this is an image that we take using a 3D camera and that is imported into this CAD system where the designer of the Gensingen brace applies his method in terms of... It shows how the thoracic curve is mirrored by the

brace. And in terms of the pelvic shift to the left and we're bringing this, pushing it down here to push it over to the right and create some asymmetry.

SB: And the void space here is allowing the ribcage more movement?

SH: Absolutely. So we want the ribs to shift over in to fill space, but that's also where they are breathing into as well.

SB: Yeah and that's fascinating. Well the person, whoever it was with the daughter with pectus excavatum, says that she's 18. Is it too late to make changes?

DT: To the ribcage shape? We treat the excavatum yeah. We can still make a difference to the shape of the area.

SB: And somebody has already asked whether I'll be sharing Sally and Deb's contact details after this. Of course we will, we'll put the presentation up. The contact is basically the London orthotic consultancy which will be easy to Google anyway. But yeah, of course we'll share your details because a lot of this is going well beyond anything that we expect to treat in our own clinics. But it will be nice to have some guidelines in, you know, what should we be trying for mild scoliosis and our own treatment in our own clinics I suspect as we go on. But I've got so many questions still to handle like, "Are there any contraindications to braces?"

SH: If the curve is flexible and it's progressing and the curve is, well it doesn't have to be growing you can be an adult, then no. If there's something alarming on an X-ray then we don't brace.

DT: You can always talk to the consultant. We do try to make as much contact with consultants as possible for the patient's sake.

SB: Okay. We have a regular questioner who has earned himself the nickname of Mrs Trellis. You've ever listened to 'I'm sorry I haven't a clue' on radio four one of the regular questioners there is the imaginary Mrs Trellis of North Wales, but apparently Mrs Trellis has sent a link to the theraflex information and also a link to a YouTube video of it, but sadly he's not written a summary for us to share and the team's feeling very disappointed in Mrs Trellis. I don't have that link here, but I imagine it's being shared on Facebook at the moment and we'll put a link up to it later on unless you've already Googled it yourself.

I've got some more questions here, but Jono you might be like me, I'm thinking, well, I mean we've got people with scoliosis, they're not severe at the moment. Surely the exercises, we looked at one example there, surely the exercises are just bend them in the opposite direction and keep them doing that as much as possible.

DT: Yeah. And I think a lot of people think that, and I think until you've treated a lot of scoliosis patients, you get that... You go for a week, even two weeks course, but you need that experience to know what you're doing. And the more patients you have, the more experience you get. Like with anything, I think-

JA: It's the difference between trying to squeeze them into a tube or actually make changes.

SH: When I see Debs teaching an exercise to a child, the way they have to contort themselves in terms of, they have to think about what their shoulder is doing, what their hand is doing, what their knee is doing. It's very specific.

JA: You're never going to find that out by accident.

DT: Yeah, but they do it quite naturally after a while.

SH: Because they learn, I mean our patients are very good at... They become very educated in what their body is doing and what they need to do in order to improve themselves. But it is very specific to their curve as well.

SB: So what are you thinking now, Jono? Were you thinking that any patient who comes in here that has any sort of scoliosis you're sending him off to the London orthotics consultancy?

JA: Yeah, so I feel grossly inadequate. My training was inadequate and the way that I look at scoliosis is just a drop in the ocean. Perhaps that's what specialties are for. It's for people to get better and to expand it into... It all makes perfect sense to me and I can't believe it's been lacking for so long, although it turns out if only I'd look back to the 1920s.

SB: How about this? We have the opportunity to end spinal CPD days with the peninsula medical services here in Cornwall says somebody and the orthopedic surgeons were always very upfront about resorting to surgery as a last possible option because they knew that in the vast majority of cases surgery opens the door to further surgeries due to the changes, the bracing, et cetera, has on bone density and strength. Do you agree with that?

DT: Yes, you know, I think a surgeon is like a mechanic, so something's a bit bent and I'm a surgeon so I'm going to straighten it. And I think they're starting to realize that actually, and their attitude towards bracing and towards the therapy is starting to change and they are looking at possibly they don't have all the answers in surgery.

SB: I wasn't aware of this business of the changes in bone density and so on as a result of orthopedic bracing as opposed to-

JA: If you're not moving, it's not going to be physiologically the same and over time it's going to deteriorate.

DT: You think the weightbearing changes when they're in the brace-

JA: I think functional movement changes.

DT: We're trying to change that skewer in the lines though. And we're not changing the weight loading of the spine and we're not getting them weaker. There's a misconception-

JA: I think Steven was talking about surgical bracing.

SB: Yes, absolutely. The question was about how the orthopedic surgeons are up front in saying that you don't want to brace people because of the changes in bone density that might occur.

DT: Yes, absolutely. And the re surgery rates really high.

SH: I think there is a shift in attitudes. And whether that's coming from evidence that's published based on longterm results of surgery or it's patient driven and they're looking for alternatives.

SB: Why have you put this slide up there?

SH: Because it's a nonsurgica improvement of an angle. So this is a juvenile case as well. So I thought that was important to-

SB: Right so juvenile meaning how old?

SH: So this was a seven year old girl.

SB: And the dates on this which are probably not visible on the screens, are 1st of July, 2017, to the 31st of January, 2018, so basically it's a six month period, six months to change. That seems extraordinary yeah.

SH: But she was highly, her parents were highly motivated. And they did everything to the nth degree.

SB: Perhaps a little more juvenile than this. Whoever sent this question, it says that they frequently see babies who lie side bent or rotated as a relaxed posture and I can feel side bending and twists throughout their systems. And I always wonder if this becomes idiopathic scoliosis later if I'm treated. Have you any thoughts on that?

SH: That's a very interesting theory.

SB: Hard one to research isn't it because I imagine you'd have to observe a vast number of babies, all of whom are lying in, various different positions and then correlate that in a few years later.

JA: If there was a direct correlation, we'd see hundreds of thousands-

SH: Yeah, more than 3%.

SB: Well only if this is a natural posture in babies, but it's an unnatural thing then-

JA: Then that's a pre-existing additional component.

SH: Presumably those babies will be having osteopathy or chiropracty, so it would be great to follow this up. Did they end up with a-

SB: I suspect that the state of things being as it is, it's very hard for us to justify interventions with babies. However, right can we kill that for the second. Would you put a brace on a teenager with a scoliosis and also the early stages of ankylosing spondylitis?

DT: Well, it depends on what you-

SH: If you think back of whether-

DT: I don't think we've treated an ankylosing spondylitis.

SH: It would depend on what their X-ray was saying.

SB: Right, so the degree of fusion in the spine.

DT: And where we would be pushing in, if that would worsen the spondylosis.

SB: Presumably this is the antithesis of good treatment for ankylosing spondylitis because it is holding a spine fairly rigid, isn't it? And you want lots of movement through it, but they can still take it off and be given lots of movement occasionally.

SH: Yeah, depending on what we're look for.

SB: So the answer is, "We don't know in that particular case, like everything, it's individual."

SH: And perhaps, you know, you'd be looking at a slightly less aggressive brace in terms of lateral shift.

JA: Do we know whether bracing is something that you shouldn't do ankylosing spondylitis?

SH: Ankylosing spondylitis can be treated with a brace, yes. But I don't necessarily think it would be-

DT: We also treat hyperkyphosis. Quite a lot as well, but the different dimensions are the same.

SB: Now do you remember before we started this, most of you asked me, is this all about juvenile scoliosis or can we go off in random directions? And I said, we can talk about whatever the hell we like on this. I mean we've done a little juvenile scoliosis. Here's one for you, Sally. Do you know whether helmets for plagiocephaly are painful for the kids? Not much to do with scoliosis I imagine.

SH: No. So a helmet treatment for a baby works in quite a similar way in terms, but it's all about voids. So when you're trying to get a correction of a flexible skull, you're not pushing it, you're just creating space for growth. So you're controlling the path of growth.

SB: Which way it goes.

SH: Yeah. So a helmet on a baby is not tight. They're really quite loose. You can hold it, you can wiggle it backwards and forwards. So there is no-

SB: That's the helmet, not the baby.

SH: Definitely, yeah. You can, you can literally tilt them up and down. They have a degree of circumferential space within it. That's part of the treatment.

SB: So it aught not to be painful, although babies might be irritated by it.

SH: It shouldn't be painful in any way at all. It's another full on treatment that they've worn for 22 hours per day and they come in happy and smiling and they sleep soundly with them on. So that leads me to believe that they cannot be painful, otherwise they won't be tolerated.

SB: All right. And I imagine we got that question because you mentioned helmets when we introduced you at the beginning. This one's in capitals and it comes from Zara who has an adult 30 year old who has a right thoracic curve with severe lumbar curve. She can't remember the cobb angle, but the surgeon says they can't have an operation until she can't carry on. The main symptom is L34 compression with a right anterior thigh pain. Could a brace and exercises help her. The patient is head above pelvis, the pelvis is not offline. So there must be a double curve in there somewhere, at least.

SH: Yeah, if it's centered you would assume it was balanced.

DT: So she's got, her main symptom is leg pain?

SB: Ah, yeah. She's getting-

SH: L34 compression.

SB: Leg pain, anterior thigh pain on the right. I love the fact you're being asked to diagnose these people without even seeing them.

DT: You'd be surprised how often that happens. I guess I don't want to assess it. I know that sounds a bit of a cop out, but you know, I'd want to see if that pain was coming from there and where would we go from there and how flexible she is and yeah.

SB: Well I'm guessing that Zara will have carried out some treatment on this patient to look for obvious other causes of anterior thigh pain. But again, I don't know.

SH: And the adult patients that we see come in, you have to just take off the layers of previous treatment-

JA: Out of the juvenile scoliosis, we're moving into the realms of which maybe more people will identify. Are all of your techniques ultimately translatable to one degree or another to the older patient?

DT: They're a lot more complex. And sometimes they blame scoliosis for a lot of symptoms that okay, there are alignment issues but not necessarily... As I said before, you know anyone with the sagittal profile malalignment can have pain and so you have to really start from the beginning with an adult. But yes, we would try what we would try with the adolescents, so we would try to correct the posture. We would try to correct the three dimensions and see if that had an effect on their pain, if they had it or if they want to improve their appearance as well. You know, we do brace some adults for that as well. And it's a different brace for pain.

SH: We're moving away from those standard classifications. I mean all the braces are bespoke, but the treatment plan is much more bespoke because there's usually been some surgery. There's some nerve issues.

JA: Yes. They've come in with specific pains that-

SB: We've probably got time for one more question. Told you the time flies when you're enjoying yourself. It really does. And it's just disappeared off my list. Is there, I quite like this one actually, "Is there any prevalence of EDS, Ehlers Danlos syndrome, or other hypermobility connective tissue disorders amongst scoliotic patients" asks Robin.

DT: Yes, there's a lot of syndromes. There's a lot of syndromes and that come into the non idiopathic list.

SH: There's a prevalence of EDS patients in our clinic because they are... There's a lot of mobility and they require a lot of correction in terms of even walking as well and going back to the insoles and the poses as well.

SB: And just in case you want to where there's a really interesting broadcast that we did with Nathan Haston on juvenile hypermobility in our records somewhere. Well worth a look if you're interested in EDS and others. Probably quick observations. Allie says, are there other centers? We discussed that at the beginning. It's a long way from where Allie is and someone has noted that three K is a lot of money, but surely it's cheaper than surgery. But I suppose that presupposes the NHS has a logical process through which it analysis how it spends its money.

JA: It's cheaper even than a set of four Barrington rods I believe.

SB: Following up on the plagiocephaly, do you feel that could be a precursor to scoliosis? I've been asked.

SH: Yes. There's plagiocephaly and there's hip abduction and hyper mobility and overpronation and scoliosis in the middle.

SB: So all of those things. I said there was two questions instead of one plus an observation, but we are running of time now. Sally, thank you very much for coming in to talk to us. Thank you for coming in as well. If there are any more, can I send you some surplus questions afterwards if possible?

DT: Yeah.

SB: Jono, thanks for all your very learned observations on the topic here. I'm sure we'll be seeing more of you in the future, so I hope we will on the program.

JA: Thank you. I'd love to come back down.