Academy of PHYSICAL MEDICINE

Transcript

The Bare Truth

With Matt Wallden

APM: I have got, Matt Walden back in again, Matt is here now for the fourth of our discussions?

MW: This is the third, this is the third of our discussions

Um we've had some really interesting stuff about neutral spine there's the train right on cue. And this evening we're going to be talking about the bare truth. There's a lot of discussion as you know, across various forums about how to deal with what are not anatomically perfect feet to deal with people's gait, whether you give them orthotics, we don't give them orthotics. Um, Matt has done a lot of research into this and he's been at the forefront of some of the advice given to the barefoot companies and I know he's got some very strong views about what we do with treating our patients in this regard. So, Matt, great to have you back with us again.

Thank you very much. Thank you very much.

Where should we start. We'd probably start with the um or whatever conventional philosophy on gait is, what is gait according to the textbooks.

Well, according to the textbooks, of course gait is um, starts with the heel strike, uh, and then you have mid foot portion, the toe off and then you have a swing and uh that essentially seems to be throughout most uh gait analysis textbooks. That's the description of gait whether you're walking or whether you're running. Um, but what we find is that when people go into the natural condition, which is barefoot, of course, then that typically switches to a forefoot strike. So instead of striking with the heel, you strike with the forefoot and then the mid foot and the heel

made us kiss down against the ground and we've got some, some slides that we'll look through later on. Sure. Which, which show what that means in terms of the forces that are generated. But essentially it seems that it's a lot less injurious. There's lots of connections in with the um other potential running injuries, knee injuries in particular, back pain. Um Achilles problems and so on. So you know hopefully we can dig into that as we go.

And I needn't to ask whether you can back all this up with research because I know you're quite keen on that sort of thing.

Yes, yes. So there's, there's plenty of research on it. Um, but I think it was one of those things that was a quite a seismic shift for, for many people because since the advent of the running shoe, um, which was the 1960's, 1970's with, with Nike coming up with their waffle trainer prior to that, there were of course shoes that people will run in, but they were more like plimsolls extremely thin, thin soled shoes. Um so very much like the minimalist shoes of today. Um, But from 1970's onwards you started to get this concept of a, this waffled sole, which, which you know, is a cushion shoe. And so from a, from an evolutionary perspective, that's a very tiny fragment of time for humans to adapt to the notion of a, of a cushion shoe versus the 4,000,000 years or so, prior to that have been barefoot or minimalist.

But people's been wearing shoes a lot longer than the 1960's and they weren't necessarily wearing them for running. But so that they'd be wearing boots and shoes with some degree of cushioning in the sole or the heel, are they not.

Um they have shoes. One of the interesting things about shoe archeology is that, um, the earliest signs of shoes in the archaeological record about 40,000 years ago. And so that's the duration the humans have been wearing shoes for most of that time. They've been kind of moccasin style leather, yeah, like, like a moccasin. So practically no sole. And what's, what's interesting about that is that there's the 40,000 years happens to tie in with when our ancestors first moved into colder climates. So you can see prior to that there was migration out of Africa, but it stayed all in lower Asia are down towards Australasia. No one moved up into Siberia or to Europe until around 40,000 years ago. So the interesting thing about that is the either the shoe, the invention of the shoe allowed us to migrate into colder climates um, or moving into colder climates necessitated us to invent a shoe. And so, you know, the reason I've sort of gone to the length of explaining that is that I think, um, you know, you get people that get really into a concept like black barefoot running or barefoot

training or whatever it is, and um on the various forums around barefoot running, you will find that, uh, people, uh, you know, we're kind of comparing chilblains and comparing a frostbite and this kind of thing. Like it was some kind of victory. But the reality is that ancestors wouldn't have done that because as soon as it got cold enough to need shoes, they invented shoes. It was too cold. They didn't go that far north. So, um, so I think you have to be careful about being too zealous with the barefoot evolutionary.

I'm going to interrupt you there because we are five minutes into the broadcast. I don't think we've ever had a question so early on in the broadcast. So, I don't know who sent this in but whoever sent in apparently thought that medieval people walked differently from us because their shoes had softer, thinner soles. More like walking barefoot. They didn't heel strike, placed their toes down first. Have you heard this theory and how does it correspond to your experience? So let us know who you are because I think you win tonight's star price, for the first question, the earliest question that we've had on broadcast tonight.

Yeah, yeah. Um, I think there's um certainly some truth to the fact that they probably walked differently and the … if you start wearing minimal shoes, you tend to walk differently, certainly a lot more cautiously and tends to roll down the foot, which was really, I don't know if you remember the MBT shoes, but they had kind of rocker soles. And the idea was that they allowed the foot to roll down, um, in a similar way, to the way the muscle walked in the sand.

I thought the idea of those was that It provided an instability which meant that your muscles are always working and therefore

that wasn't the original concept. That was when the big money guys came in and said, we need to start talking about cellulite and toning bums, this kind of thing so he can sell more shoes. The original concept was to try to create the shoe that mimics the way the muscle walk on soft sand and so what they show in their kind of promotional videos is the heel hits the sand, there's a slight give and then because the sand then mounts up in front of the foot, it creates almost like a rolling sensation of the foot from, from heel to toe. So they tried to recreate that rolling. Um, so basically minimizing impact.

I actually find walking barefoot on sand is very uncomfortable.

Do you, yes.

Yeah, because mounts up underneath the middle of the foot, which I find is quite uncomfortable pressure. Yeah. I'm old am I

probably, one of the interesting things about us, a shod folk that have grown up wearing shoes is that um our feet become hypersensitive in most cases. So it will be like if you'd grown up wearing sunglasses or even an an eye mask the whole time and then suddenly someone says to you, it's really good to uncover your eyes. We take them off into the world would blind, you know, you'd be over stimulated. Um and It's the same, with the feet same, same principles. So it takes quite a while to transition to being barefoot a,

You're sounding a bit of a religious zealot here. If you take off your shoes and the light will dawn.

So it's interesting that Moses, Moses, apparently at the burning Bush, he said, uh, that God says to him, shed your shoes, not take off your shoes, shed your shoes for you're standing on holy ground. And uh, yeah, it's, you know, when you, when you dig into the um first the bio mechanics, but also some of the, the uh, other information around earthing in particular and the notion that it particularly in this day and age surrounded by electrical circuits and carrying mobile phones and this kind of thing. We build up when we've got rubber soled shoes, we'd build up a micro voltage in the body which, uh, has to be earthed, uh, to allow your cortisol levels to drop. So when you, when you're holding micro voltage in the body, and there are research papers on this, I've spoken to one or two people who raised their eyebrows and say, that doesn't, it doesn't quite add up from their understanding. But there's research papers that show that you know if you are, um wearing standards rubber soled shoes then just exposure to this, uh, these electrical fields mean that we hold micro voltage, the cortisol stays high and we don't get to get into a deep sleep, we don't repairs effectively. So this is the whole kind of science of earthing

And that doesn't happen in, in barefoot walking, whatever, and it doesn't have any leather soled shoes. Is that right.

Yeah. My understanding is that, well, I'm not sure about leather. I think if the leather was wet, certainly you be likely to, to get some earthing through the leather sole, but, um, but I think anything that's synthetic, uh, will impact on your ability to earth.

But going back to that a question I'd been intrigued to to know. And maybe the question and the answer to this. How do you know that medieval people walked differently from us? How would they find that out?

Yeah. I don't know what I mean. Certainly there have been studies on, on um, archeological digs and uh, skeletons which show that um a toe formation, for example, in particular was different. So medieval is perhaps a little recent in my understanding of it, I think it was further back in history when shoes were much less commonly worn. Um, and then what you find is that there's less arthritis in, in the first MTP, MTP, for example, you know, so of course shoes tend to bend our feet in and create stress on that MTP. Um, so that's one way that they know that probably they walked somewhat differently. The forefoot striking in walking gaits, uh, as implied by the question is contentious um because in walking gait you can still strike the ground quite comfortably with, with a heel strike without creating, any great a jarring force, is just depends how hard you hit hit heel, you know, so it's kind of an intentional thing, um but when you're running, as soon as you start to heel strike, it creates what's called an impact transient in which we can look at in a moment. But, um, and that is quite injurious. And, uh, the, the kind of intact and functioning nervous system doesn't like that at all. So you switched to the forefoot strike when you run.

Not everyone does,

not everyone. No.

Um, and, but we did have, um, a podiatrist and one of these broadcast some time back and he was talking about running, coaching runners, and said that to improve running and to get faster running you don't take longer strides as many people would think because actually that means that you're going to heel strike more firmly and send more shock.

That's right, yeah

along where the length of the lower limb, but actually we take shorter steps just using, doing faster so that you're well over the heels of the time that your heel strikes, assuming you're heel striking. That was Joanne who asked that question about medieval people, Joanne if you got any more information and thanks for that. But um do feed in. Um, I've got another one here from Vlad. Vlad says I decided to use my vibram five fingers today in preparation for this evening, drove for an hour visited with a friend just as I started to drive back, had a flat tire, changed the tire and my vibram five fingers drove back for half an hour. Point is the ball of my right foot hurts like the dickens. Is it necessary to do a few hours at a time rather than the whole day?

Um, OK. So he had perhaps a similar experience when I first got my first pair of five fingers I was teaching a course in New York and walking around the concrete

streets and had exactly the same thing, like, you know, My, the ball of my foot got really sore and of course because that's the point at which you drive off the foot. So that's where you get a maximum pressure spike and that's one possible reason. Um, and so, you know, you have to adapt gradually. Um, we have a kind of transition calculator which, which we're going to share with everyone um to help people understand the duration, but simplistically put, your nervous system will adapt to barefooting almost instantaneously. So if you're able to go outside now and take our shoes off and run down the road, their strong likelihood is we'll go straight to a fore foot strike. Not everyone does that as you as you just mentioned, but most people will

because probably it hurts otherwise-

well, that's it, that's it. So their nervous system has read the situation, changed your strategy for running straight away, but the muscular system obviously it's going to take a little while to adapt because now suddenly instead of heel striking, you're now taking the low through the forefoot, which means your calf and Achilles complex is taking a lot more load. So the, the, the most common thing that people report when they've switched to minimalist shoes or barefoot running is they get really sore calves and the adaptation for muscles probably is around six to eight weeks, something like that. So if you're transitioning into programs, it's going to take a few weeks, but the passive subsystem. So. So the connective tissues, plantar Fascia, the Achilles tendon, well because it's so slow adapting is going to take months for that to adapt. And so the, the, the recommendation will be about six months as a minimum to um transition into barefoot running.

Yeah, Vlad didn't tell us how long he's had his um five fingers.

Yeah, yeah, yeah.

But I know we're going to talk about those later because you're wearing your five fingers at the moment.

I am.

Will will hold off from that for a second.

Yes.

Sally says this is a great analogy. Holds true for horses as well. I'm not quite sure what the analogy was there, but I know I did see one of Claire's Horsey magazines just before I left the clinic earlier on today, which says that barefoot horses are all the rage at the

moment, so I don't know what they're wearing Five finger shoes. But what?

Well funny enough, Um Vibram who make the five finger shoes. They also make, um, Vibram horseshoes that are rubber. So it's the same idea, like a minimalist horseshoe. Um, uh, but, but, uh, another thing that's interesting about the equine world is that they were on this way ahead of the human world. Um, so the, there's papers on this from, from, you know, 2001, uh, the early 2000's in general, talking about this controversy of barefoot horses versus shoed horses. And it's exactly the same argument as the controversy around around humans. Um, you know, the whole evolutionary argument, the idea that the hoof is designed to attenuate shock effectively, um, and that as soon as you put something rigid onto it, then it can't attenuate the shock as effectively. And the research seems to back that up. But it's contentious, you know, because there's a pattern to how we behave in these situations for quite a period of time.

Yeah. And I can, and I can see the logic with horses. I mean if you, if you fix a rigid iron structure and all steel structure underneath that hooves, then that expansion was necessary as they put their weight on anything could happen and that's going to have different stresses and strains…

definitely.

And I'm sure that if I, I know that, um, we have a friend who's an agent for the various types of rubber boots for horses. It's Wellington's rather than, um, but there's a lot of science and technology is behind that because as I understand, it's quite hard to get the things to stay on.

Right.

But anyway, we're not here to vibram and their work with horses.

No, no but there's a good, um some sort of a drill that I recommend anyone at home to give a go to. Um, and uh, I do this when I take workshops talking about the importance of the toes and it kind of ties in with the idea of the hoof and the horse. And that is that if you, if you kneel up on the ground so that you're basically you're on, on your knees like this and in the space in front of you, but you fall forwards into a push up position um what I do with, with my groups. Says, I just want you to fall forwards and demonstrate. And um, then I get them all to fall forwards one at a time and say, what do you notice about your hands? And they will look down at the hands and all of their fingers are splayed like this, say, well now come back

up and deliberately keep your fingers together. Do you want to fall forwards? And they go, no, I do not want to fall what they know that instinctually that's going to create a jarring. They need to let the fingers splay as they hit the ground to, so like the hoof splaying to attenuate the jarring. Um, so, you know, it's kind of within us and the shoes do exactly that. They hold our foot like this and they don't allow the toes to splay. So there's potential issue there straightaway, the shoe design.

Um, I don't know but, we've got loads and loads of comments coming in already, um Joanne. Thank you Joanne. Joanne sent us in a reference to the thing about medieval people and it's a long, a long reference which we will share after the broadcast, we'll put up as a link, so people can find that. Um Robin's asked, how the hell micro voltage prevents cortisol levels from dropping.

Well, um, there was a search from a James Oschman and his group, so he's, he wrote a book Energy Medicine and uh, this was research I read probably about 12 years ago, something like that. And, and what it seems to do is, I don't know the exact mechanism, but it's to do with creating stress in the body. So it's, you know, the micro voltage is creating a stress response in the body and to take your shoes off into earth decreases the stress response and allows cortisol to drop. And, and you know, th th, this guy sent me two or three studies on this and there's been a lot since then as well. So I don't know, like I say, I've, I've spoken to physicists who say that doesn't sound right to me, but then James Oschman is also a physicist and he's got research that backs it up so you know, I'm not saying that's the way it has to be, but it ties in with a with sort of natural…

And someone has send in an observation saying that if you touch someone with your hands, that's going to earth you, but I guess we're talking about people who were just walking and not touching therefore, for, for the period of the duration between touching things with their hands. Yeah. Those cortisol levels will stay elevated.

This, there's that, and the other thing that Oschman talks about, and I think there's another guy who's, who's kind of become a leading light in that field and they talk about the notion of actually picking up free electrons from the ground when you are barefoot and a free electrons are absorbed into the system and behave like antioxidants in the system. So they help to heal injuries for example. And you know, one of the, one of the proposals is, this is why animals heal more quickly than, than humans tend to because they're barefoot the whole time and they're in contact with the ground the whole time. We tend to stay off

the ground. We sit on chairs, we have rubber between us and the floor. We'd get into bed at night and so some people could go through almost an entire day without actually touching the ground because they're constantly protected as it were.

I'm looking at you through, um, slitted eyes because I'm just thinking that sounds a bit hippie philosophy to me it doesn't sound as if it's not backed up by anything.

It does, but it's, it's an hypothesis that Oschman put out in the General Body Work and Movement Therapies back in around 2008, 2009.

Well actually I know that Leon won't have anything into that journal. If it's not reasonably well researched and justified.

You know. And Oschman is not making claims. I don't, I don't think he's saying this is how it is. He's saying this is research that we have that supports claims that, that the Chinese made about Meridians of the earth connecting two Meridians of the sole of the foot. Maybe this is how this works, you know, he's more, um, putting a hypothesis out there rather than saying this is how it works. But the papers on cortisol were very much, you know, showing that if you don't, if you don't earth the cortisol stays high if you do earth cortisol drops down. And so I, I'm not a physicist, I don't understand quite how that works, but uh, the papers seem to back it up.

Um presumably we could dig out the reference from Journal of a Movement Body Works, [inaudible] for movements therapy

Um yeah, it's Journal of Bodywork Movement Therapies. Yeah.

Because actually, certainly all the osteopaths watching have free access to that through their GOsC account, but.

Oh yes. Yeah.

So they could, uh, we could, we could make that available.

Right. Ok

Um there's a few questions coming in about arches and I was going to start off talking about those because conventional wisdom has it that there's at least two arches, the longitudinal, medial longitudinal arch, the most prominent one, and then the one under the metatarsals. Now what you're suggesting is actually those arches aren't so important, but you're

saying it's the shoe which is holding the foot in that position, whereas.

No, no, no, not so much. No. What I'm suggesting is that um a foot that is healthy and functional uh has these arches and when it becomes deconditioned or in- inhibited, then what you find is those arches, you know, either disappear or they um disappear under load. And this is quite contentious because, you know, there's a lot of discussion around different, uh, uh, genetics and races and so on, you know, having a propensity because your family line are all flat-footed, etc. Born, born, flat-footed, this kind of thing. But there's a simple, a test that I use for those people to help them, uh, understand that a flat foot is really only just the muscles and nervous system not being awake. And that is to use the foam roller. So I don't know whether we want to do that now or later.

You said you have a trick.

It is a trick. It is a trick -Well I say it's a trick. I mean, it's um something that I think – a trick makes it sound like it's not real, uh, but, but what it demonstrates to people because there's many people that prescribed orthotics, there's many people that wear orthotics. Many people that believe they've had a flat foot for their whole life because it's a familial thing and the moment you put them on a foam roller, the arch returns and they've never seen an arch on their foot before. And uh, the reason being, as we were talking about in the previous Webinar on the math of core stability, um you're stimulating the tonic nervous system, but at the same time you're unloading them because they're laying lengthwise on the foam roller. And so what that means, of course it's the, there's no load going through the foot, you credit balance challenge, the tonic nervous system increases, it's a drive and suddenly the arch reforms. So there's a simple test called a credit card test. You have to be barefoot for this. So you might, you might have, if I'm going to use you

You can use me, hang on I'm going to, let me … stuff this somewhere.. um um Ok ok

and do I have my foot to be bare they're not well

probably for about you know in terms of,

this is when I find out I've got holes in my socks and

that's it. Yeah. Yeah yeah

Right. OK. And we're going to do your. Is this part of your, your trick with the foam roller?

Yeah. So first of all I'll get you to stand or do you know if your feet overpronate or over supinate?

Uh yeah they do over pronate

So we're interested in here is, is the lateral malleolus in direct vertical alignment with the w, with the lateral border of the foot. OK. So here actually we can see that the lateral Malleolus. Now you may need to turn a little, I'm not sure, but the lateral malleolus there is actually overhanging the lateral border of the foot. So that's, that's hind foot supination. And the beauty of, this is, we can see by how many millimeters roughly, say that. I would say that's about four or five millimeters. Of course. When you look down, have you ever injured that ankle to or fractured it?

Uh, I think probably, probably, I can't remember that

because that obviously could influence things if there's high perch through the bone. But in general for most people it's worked well. And I'll just check the other side and we'll just look here. And then you've actually got you a perfect vertical alignments. So this isn't going to be a great demonstration on you because you're already in the alignment that we want. But if let's just, get you to roll in for a moment, see the way, now we've got maybe two or three millimeters between the credit card or business card and in the lateral Malleolus. So and that's what most people you assessed because about eighty percent of the population are over pronated. And so most people you assess, you'll find that the medial Malleolus is within the lateral border of the foot. Sorry, the lateral Malleolus. OK. So having done that, we then do is get them to lay down with their bum on end and the head at the other end

Ok, this is going to be tricky

and this can be tricky

because they will see how the microphone cope.

OK, and knees bent up. You Ok there?

Then you suddenly get a whistling in your ears. Everybody's, because one of the microphones are switched on.

Ok and so then of course we've done is you've unloaded the, the, uh, the foot. Do you want to move down this way a little bit so you can rest your head back.

Yeah.

So don't have to hold your head up for a minute. So let's, let's imagine this foot was over pronating. What I would do, first of all,

This is the most relaxed I've ever been on one of these broadcasts. Great

Oh good. So I would just put this alongside and quite often it will completely neutralize and come back to neutral um posture in terms of the subtalar joint just by laying down. So then we know the foot is actually capable of stabilizing itself because there's still some load going through that foot, not a lot certainly the load of the lower leg. OK, most of the loads going through the foam roller,

couldn't you just do this sitting because you're off weight bearing, sitting

you can do, but there's more load going through the legs. So then you've got the weight of the thigh. So now what we can do is I normally need to do to get the um, the arch to reform is to ask you to pick up your right leg, Ok so you pick that up. Now at the moment you, you kind of cheating it because your arms on the ground. So that makes it a lot easier to balance ok, and bring the arms off the grounds. And now what you see is the, the arch muscle switch straight on particularly if someone's over pronated, you see the arch muscles switch straight on and then you do the assessment here and you find they've zeroed out in terms of the subtailar alignment. And so I normally film all of that and you know when I show them back the film because of course they laying then, not believing a word that I'm saying and they see suddenly an arch in their foot. They see the subtalar joint has aligned and I didn't do anything to them. I just laid them down on a foam roller and their nervous system did it for them. OK, so then what you can do is you can take this up step by step as you suggested to sitting then to single leg standing and into walking gait, running gait, et Cetera, and you gradually build the strength up and re-rehabilitate the arch. Wake it back up again.

Now I've got a question about that because my theory would be my understanding would be that the muscles and we'll be talking about here, Tibialis Posterior, picking up the arch there

and yeah,

that's going to work for a short period of time, but actually it's ligamentous laxity which is causing that, in my case, probably acquired flat foot, rather than natural flatfoot

yeah. So

And that muscle can only work for a short period of time. It can't do it all the time because we just over tired you'd end up with posterior tibial tendon disorders. Yeah. So this is why you would train in that way, you train the type one muscle fibers. So we talked about this a little bit before. So type one muscle fibers, a postural, they're designed to hold you posturally and this is why you need that three to five minute timer, tension uh loading.

So how would we do that then

uh by picking up one leg, let's say for 30 seconds, resting it down for five seconds, going for another 30 and just building it up until you've done five minutes of work on that left leg. So, so that would be the way that we will build it up. And then once that's easy,

you've done this clinically and you've seen that has had a permanent or long-term effect on the patient?

Yes, absolutely. Yes. So, um, you know, you could combine that with barefoot walking, minimalist walking, et cetera. And you know, this is, this is just one component of pronation. I mean we were talking about pronation before we came on air, and one of the things with pronation from my perspective is that this is not a foot issue. This over pronation is typically a descending issue coming from the hip and from the core. And so yes, of course the foot muscles are important and the shin muscles are important. But when you think of the kinds of loads that go through the foot, you know, we're talking multiples of body weight when you run, these tiny little muscles which are no bigger than a chicken wing. Um how are they going to resist? You know, I'm, I'm nearly a hundred kilograms. So when you run, depending on whose research you look at is between three and 12 times body weight. So if it's 300 kilograms, how is a tiny weeny little muscle like that going to resist. It's not. It has to work in conjunction with the muscles in the shin, with the muscles in the hip, with the muscles in the core, and the myofascial connections between those in order that you can resist those overpronation forces.

OK. Can I just pause where we deal with a few of the questions?

Of course, of course.

I've got a hell of a lot in already. Um, If I haven't asked you a question yet, it's possibly because I'm waiting to a later in the broadcast where I know we're going to be moving on to discuss the topic, which was under discussion. Does it not require a great deal of flexibility within the foot and therefore not everyone will be capable of switching to barefoot running

shoes. Also, the research I've done implies months to transition. Would that require using the barefoot wear barefoot footwear all the time, so possibly we were a bit early with that question as well, but.

Well I think we kind of answered that in terms of the, you know, yes. It will take months. Like we, like we talked about earlier, take about six months minimum.

I think the first question is does it not require a degree of flexibility that not everybody might possess in order to make it happen at all?

Well, you know this, this is part of the, the issues that if you wear a standard shoe, it allows a full range of motion only two of the joints in the foot or probably probably one which is, which is the talocrural joint and maybe the subtalar, but all the other joints are restricted by nature of the fact you've got a rigid sole you know. So if you want to mobilize the joints of the foot, what better way to mobilize than to go barefoot where all 33 joints in the foot can actually move in the way nature intended. Now, of course as osteopaths we can go in and we can palpate and mobilize or manual therapists and so, you know, we've got that added advantage that yes, of course you can go in and mobilize people's feet, but to suggest that people shouldn't go barefoot because they're not mobile, I think is uh, you know, kind of the wrong way round of thinking.

Um a question about medieval people again,

Yes, yes.

In general terms, and again, I don't, I don't know who asked the question I'm afraid, um in the past those people didn't live as long. So what effect was barefoot training have long-term with regard to drop down arches and mid-foot osteoarthritis?

First of all, I don't know, sounds like I'm being antagonistic tonight, um, people didn't live as long as the research into average life spans show that they died on average much younger. And that was because of the high levels of infant mortality. So whether you, you know, whether you look at a hunter gatherers or um, you know, sort of more uh agricultural civilizations when people got past the age of 18, they tended to live into their late sixties, early seventies and potentially older than that as well.

So the average lifespan has not really changed if he made it past all the childhood diseases and through childbirth, but the average age of death was 40 because there was so much infant mortality.

So you, are you aware of any data into the state of the joints of the elderly foot in, in historic hominids?

Well,

Was there, there was OA there

Yes. I think, I think inevitably there's OA in any elderly foots, just like in the spine, you know, you find OA for about 16 years of age on what's in a healthy spine. Um, so I think yes, there's certainly signs of OA. I just think that the patterns were somewhat different. I've not studied a lot of, um, archeology and I've studied more anthropology, so more looked at how the foot's evolved across a human hominid evolution, um, as well as across animal evolution in general.

So, um, and the interesting thing about that is that it's hardly changed, you know, there's obviously specializations of feet, but it's almost ubiquitous across the animal kingdom that the feet have five digits as do wings, as do flippers. So there's something about the design that really works well and uh, it's been retained by evolution because of that.

ok, um, quickly back to the business of, um, electrical currents, or electrical earthing. Vlad wants to keep his socks on and wants to know if it is OK to wear socks or do you have to touch your skin to the ground in order to earth yourself then reduce your cortisol? Well, I guess it depends on your socks.

I think it depends on. I mean, what, what I've heard is, um, again, I don't, I don't know the scientific veracity of it, but I've heard that, uh, you know, if you use woolen socks because wool is naturally electrically conductive, then that's a better way to earth. If you don't want to get cold feet, if you want to go out, I, for example, go out and do some Tai Chi on the patio before I go to bed typically. And uh, in the middle of winter doing that bare foot, it can take you an hour for your feet to warm up again. But I've got a nice pair of, um, what's it called? A Merino wool socks. So that keeps you warm and, uh, should allow that earthing to occur as well.

I'm not sure paddling around in the recent snow, even in Merino wool socks with your choice, your choice. I guess. Um this person Dawn. Dawn says she has degenerative discs in her lumbar spine, which now do not tolerate heel strike running. So I've tried to, tried to run with her Vibrams. Only to find, that her calves musculo-tendonous junction, have suffered big time. I now understand that I need longer transition. Would it also help to wear vibrams, when not running? I.e. to reduce all wearing of shoes as much as possible? Good question Dawn.

Yeah, I think it would. And part of the reason for that And if I, if I just find this slide here um basically that, I've talked about this slide before, um, which is Panjabi's model um it's going to bring that up. So Panjabi's model of joint stability I think is such a simple model but it's so useful for our understanding of how to move. And so you know what it shows is it shows the, the neural subsystem at the top, then the active subsystem at the bottom right and passive on the left and the, they all depend on each other. So the neural subsystem is what tells the muscles what to do, how to stabilize. The muscles then obviously do their job of stabilizing or mobilizing, moving the joint and then you've got the ligaments and the connective tissues that hold the joint together. But they also provide a lot of information back to the nervous system.

And so, you know, I think unfortunately the way we've thought about the foot for a long time is an, mechanics in general is, is as, uh, a machine without necessarily a feedback mechanism. So the nervous system seems to have been forgotten in many cases. And that's the case with orthotics in my view, a largely speaking, is that we're looking at the body as a passive entity that will respond to a passive input without considering how the nervous system will respond to that. And um, you know, research into orthotics, there's a guy called Ben Onick who was heavily involved in the development of, of orthotics and from the University of Calgary and he looked at um Ortho, orthotic interventions and he found that one-thirds of people that wear uh orthotics prevent over pronation benefited as you'd expect in terms of the, their gait profile. And one-third, there was no real difference. So even though they had an anti pronation orthotic in there, there was no real difference. Um, and one third of people got worse. So they actually over pronated more, when they had an anti pronation orthotic, it doesn't seem to make sense. If you're looking at it purely mechanically, but if you understand

What got worse for the over pronation as opposed to the consequence because the pronation itself to me is always irrelevant, is what is causing but is causing pain or discomfort or a dysfunction somewhere.

Yeah, I don't think it's irrelevant because what it is is an inability to transfer a load or an inefficiency in transforming load. So gravity's trying to collapse us into pronation and medial rotation and flexion, and our anti pronation muscles or supination muscles and extension muscles and um, external rotation muscles that they are lifting us up against gravity. So when we have, you know, protracted shoulders and pronated limbs and feet, then that's a sign that we're not able to effectively resist gravity. So we need to condition

the muscles that hold us up and hold up the, the, the, the feet, etc. But those muscles is controlled by the nervous system as um, here's here's an interesting thing. So if if you are to put something to block your over pronation then what would normally happen when you're barefoot is as you roll into pronation, you would get a stretch. So if we look at the Panjabi's model there, um you get a stretch in the passive subsystem, particularly the plantar fascia on the medial side, medial longitudinal arch. Ok? Because it's beginning to flatten, which its supposed to do, what we don't want you to, to over flatten and to over-pronate yeah. But, so you're getting stimulation to the passive subsystem. So the mechanoreceptors fire to say, oh, the foot is going into pronation, so that, that's been sent to the nervous system. The nervous system goes, oh, the foot is going into pronation, let's activate the anti pronation muscles. Ok? So then you activate the anti pronation muscles and that's what should happen in a barefoot situation. If you put a support into your shoe, you've go to pronate. And your foot doesn't pronate, it hits the block. Ok? So now the passive subsystem doesn't tell the nervous system, oh, you're going into pronation.

So the nervous system doesn't tell the supination muscles. So actually-

Does this depend an awful lot on the type of orthotics you're using? Rigid orthotics will do that. Flexible orthothics won't.

Um, yes. Yes.

Or they weren't allowed as much pronation or as rapid pronation.

I think obviously it does depend a lot on, on the orthotics and I, you know, I'm not completely antiorthotics. I think that you've got to um work with it as a tool in much the same way that we think of any other support of the body, you know, I find it quite fascinating that um it's taken us this long to work out that supporting the foot can be problematic in the same way that supporting the neck is problematic. You know, we've known since the 19 eighties that wearing a neck collar for too long causes weakness and dysfunction in the neck. Yet we seem to think the orthotics in the foot somehow is different to the neck. So we can support the foot for an entire lifetime and it should be no problem at all. It doesn't make any sense, you know, the foot has, is just the same as any other part of the body. And so, you know, a good analogy is, is like when you break your arm, uh, we've all seen somebody who's broken an arm, broken her leg, and when they take the plaster off the plaster, that's where the arm is generally dropped about 60 percent of its original size, so you had about 40

percent atrophy. And what that means is that, um, you know, the way we deal with feet, because feet, our feet have atrophied as well.

If you look at people that don't wear shoes, they have much more hypertrophy feet. You look at people that run in minimalist shoes and as a research paper on this just about three months ago, shows minimalists runners have much greater muscle development in their feet. Ok? Um, so if you, if -

This is the intrinsic muscles of the foot,

Yes, yes and particularly the flexor abductors, flexor hallucis abductors. Is that the word, around?

Yeah, that'll do-

The abductor hallucis brevis. That's it. So it's, is the one that abducts the big toe, let's put it that way.

That's just about there,

And so and of course, that's right in the medial longitudinal arch. Anyway, um, so back to the analogy of the broken arm, so what we do with feet is analogous to us, you know, you coming to me and saying, oh look Matt, I broke my arm, my muscles are withered away, what do you think I should do? And I say to you, well, we need to support that Thats got weak, let's put it back in plaster, but clearly the wrong thing to do, it makes no sense whatsoever. What I should say to you is, well, you need to gently build that up. Takes, take your time. It may take a few months but we'll get you back to full function in a few months time. Ok. Equally stupid thing for me do, will be to say, oh, you need to do handstands on that. Need to do ballistic push ups because that's, I've seen that's good for strength. Well your arms are too weak to handle that. And that's unfortunately is what people have done with barefooting is they've, they've heard that it's good for building up strengths so what do they do? They throw out their running shoes, go for 5K run or that's, that's analogous to what I just said, you know, having two broken arms and hands standing, around 5K will be crazy.

Um, I'm going to deal with a few more questions If I can-

go for it, got for it, yeah.

Again, um people are being very shy and more questions with no names. I'm sorry about this, but this person missed the start of the show, but says that he or she has worn barefoot-friendly shoes for the last five years, 90 percent of the time and loves them. Mm, his or her two boys who have been as barefoot as

possible in barefoot shoes, but they're incredibly expensive for growing feet. Um the four and a half year old rolls in slightly at the ankle and is externally rotated slightly from the hips when I watched him from behind I feel myself fighting with my instinct to keep him barefoot versus supporting his arch and ankle. Would you say about that? Well, he's been barefoot and he's got this perceived problem.

Yeah. Yeah. It is difficult to say without assessing. Um, because my guess is the underload his hips won't be externally rotated. There'll be going into medial or internal rotation. Also, the hips are

It’s quite unusual in someone that young externally rotated hips isnt’ it. I think it will be the other way as they develop -

Yeah, what tends to happen in my experience or understanding it is that, um, when muscles like the glute medius, which are quite key and glute max to prevent internal rotation of the leg under load, when those muscles are inhibited or de-conditioned, what tends to happen is the piriformis tries to compensate. And so what you find is a lot of people with decondition glutes will stand with an out, turned feet, uh, so externally rotated, but because they're unable to stabilize through the kinetic chain you find they have pronated feet at the far end.So it seems contradictory pattern because you'd expect the external rotation to naturally go with over supination and internal rotation to naturally go with over pronation. So, um, you know, this is why in my view is so important, not just to assess someone standing. You've got to watch the way they walk. You've got to watch the way they squat. You got to watch the way they lunge. And that starts to give you better insights into how they're moving in activities of daily living in, in sports and so on. How they're transferring loads through their body.

There’s another question here which says what's your view on putting children into orthotics? And Um guessing from what you've said already that you're not great fan of orthotics generally.

Well, yeah, in general, and I'll give you a real brief story. We had a retail when we distributed the Vibram five fingers between 2007 and 2017. Um, we had a podiatrist that stopped the five fingers and he had been involved in developing orthotics for, for a period of his career he was 25 years into his career. So he developed orthotics with, with, uh, an orthotics company. Then he thought he could do better himself, so he set up an orthotics company himself. Then he read the book, Born to Run and had an epiphany and just thought I'd been doing this all wrong because the book Born to Run really questions the whole paradigm

of support, cushioning, orthotics, et cetera. Um, and it's a great, great, great story actually, but it was powerful enough for him to really reconsider everything he had been doing and he thought, well, you know, actually everything I've been doing for the last 25 years doesn't make sense to me anymore. And so I'm gonna switch and go barefoot and it will be, I've got to live it myself. So he went completely barefoot for three months himself and started to apply the concept of being barefoot to his clients. And what he found was that whereas originally he had thought that probably about eighty percent of people needed orthotics and 20 percent perhaps were gifted, didn't need the orthotics. And he said that's fairly standard in podiatry profession. He said, now I believe that 95 percent of people don't need orthotics given the right environment, given the right exercises. And five percent do, because they've got rheumatoid arthritis, arthritis and other, you know, pain conditions, diabetic conditions where the proper deformities of the bones and the joints where you need, you need orthotics to support that. But he feels that the vast majority of people, they don't need them. They just need the right stimulus to the foot.

You talked there about deformities of the foot. Let's talk about hallux limitus, hallux rigidus because many gait analysts or podiatrists would say, ok, well we need to give you a specific type of orthotic to allow the hallux to function properly so that you can toe off in the correct manner and so on and so on. You have a different view or belief.

Um, well, with limitus definitely have a different view because um what you see with, well, with both limitus and rigidus, Um, what you see is that typically there's there's a hollow I'm sorry, what was it called? Um trying to think what the correct term is, umm you've got a valgus, that's it, hallux valgus. Ok. So you've got quite a significant valgus associated with that. And that valgus is all part of this overpronation pattern. So part of this deconditioning pattern. We've got it. We've got a slide actually, um, which, uh, is from the journal of orthopaedics. Um, and it's 1905. So this is, this is the image here, um, and what you can see in this picture, which is just taken the, you know, I, I guess, uh, an English gent. Um taking his shoes off. So the, these are shoes and there's his feet and what we should see on a foot is that if you draw a straight line through the big toe, it should, actually end up coming out through the heel. Ok? That line, come up through the heel. So if you look at the next slide, this is actually uh, an indigenous Bagabo Indian. And that's exactly what happened to- You draw a line through the big toe and that line ends up coming right up through the center of the heel same thing if you did the second toe, the third toe, any, any of those toes, because essentially you've got the ray there, so, so

the, the, the digi- followed by the metatarsal and it goes straight back into the associated tarsals.

And what that means is that as you're walking along the foot energy or loads, which are forms of energy, are being transferred along a straight line. As soon as you, if we go back to the previous slides, soon as you have something which is creating a bend in that straight line, well that creates piece of electric charge. So you get mechanical forces or mechanical forces creating electrical charges, the electrical charges are what stimulates the fibroblasts to lay down tissues and the osteoblasts. And so you end up with a hallux valgus forming there and uh bony changes and joint changes and so on. SO, um -

Are you associating this with this gentleman's footwear because I thought the idea that footwear cause hallux abducto valgus, bunions where I thought that theory had been disproved to some degree.

I don't think so. Um, and the reason I don't think that's the case is that I've seen several studies comparing uh children from Australia, and from Germany, for example, was one of them. And um, the idea was that the Australian children, when they analyzed the cohort, spend a lot of time barefoot because the weather was good and it was a kind of cultural norm, whereas the German kids were constantly shod Um a grown-up almost entirely shod. And what they found was the Australian kids had wider, stronger, more functional feet, much less hallux valgus and so on. And so, so that was, um, one study. But there are other studies like that. Um now you might have seen other studies which go against this is the problem with studies. You can find things that, to back up.

And also the terminology you've been using, you talk about more functional, stronger feet. But of course I've always questioned the degree of normality that the textbooks, um, apply to different foot shapes. I mean what is normal, what is suppose- just because it, just because you're Indian chap has particular shape, it doesn't mean it's the perfect shape of feet.

No,

I can see why having a hallux which is in line with the metatarsal would be a jolly good idea because then the hinge will work properly. Um but again, that's just common sense rather than anything else. Any proof -

And I think if you look at children's feet then you can see that their raise are all in perfect alignment and then suddenly we start to put them into shoes. So here's an example actually, if we scroll down a little bit further from that same journal, um, there's an image of again –

Interesting we have to get back to 1905 to get pictures of feet.

Well, yeah, you know, and I, I think part of what got me into the whole story with Vibrum five fingers was that I was looking in the general body work and movement therapies in 1998. And um, I saw an image that they were talking about the anatomy of the foot and someone has an image within this article and saying here's the anatomy of the foot.

And it was a completely deformed foot like a lot of cadaver's feet are, but it'd been, you know, obviously drawn from a cadaver with big hallux valgus. Um, and I was looking at it thinking, well, you know, that's not a healthy foot, that's a dysfunctional foot, that's worn shoes all his life and probably had a deconditioned owner. Um, but, but, but that's not a healthy foot, but it was being described as a, as a foot, you know, so, you know, I was thinking this is not right. We need to find a way to create footwear which stops this kind of hallux valgus from occurring. And so I wrote to Adidas in 1999 to suggest that they make a shoe that had toe pockets in it, um, because they had a taekwondo shoe at the time, was very, very thin. So you had the proprioception, but they should put the toe pockets in. And um, they wrote back saying, thanks for your idea, but no thanks. And then seven years later the Vibram five fingers came out and so I've straight onto that and ended up becoming the distributor for it.

But this image, this image is really showing how um. So this is a father on the left-hand side. So this Bagabo Indian, again, never worn shoes in his life. This is a seven year old, his seven year old son who has worn shoes now for three months. And you can see straightaway again the line through the big toe of the father, straight out the heel, line through the big toe of the son completely misses the heel. Now I'm not saying that that's definitive proof. Of course you can make various arguments say, well, you know, he's got his mother's genetics or whatever -

Or it's just a single case study.

Yeah, N equals one. But I'm saying, you know, the, the logic of the straightness of the bones and the raise, um also the findings that when we don't wear shoes our feet get bigger and stronger. And when we do wear shoes, they get smaller and weaker essentially only a smaller but. Less bulky, less uh atrophied. That's pretty conclusive now. Um, uh, so know I don’t think there is much to the debate from my perspective,

yeah, ok

Many people, not just those who've got a painful deformity, there will be Exostosis over the, um, mtp, the first mtp joint, um, so that will contribute to the hallux limitus or later on rigidus.

Are you, is it your opinion or has it been shown that that is a consequence of wearing shoes and therefore causing toe deformities? Which has led to that Exostosis or is that something which is a natural process and could happen anyway?

Well, I think, I think the Big toe is always going to be, is the point of which pronation stops really, you know, and so it's always going to be prone to, to, uh, wear and tear and abhorrent loading. But I think we've become so de-conditioned in modern life with all of our sitting. Uh, you know, one of the things that's a Leberman talks about who is a professor of anthropology from Harvard University, he's done a lot of research into better running, um, is that the glute max only really activates when you're, when you're running at quite speeds, um, when you're doing deep heavy squats when you're climbing and when you're jumping. So basically explosive activities or running but not just trotting along, properly running, you know-

So deep, when you say deep heavy squats, you mean overloaded squats with a barbell or-

Yeah, you don't get glute activation, unless you have loads associated with it, they will activate, but, but they won't become overloaded to any great degree-

From any of those body weight's probably quite a load from-

so then there's the bodyweight side to it as well, but the point being that most people therefore don't really condition their glutes at all in their daily living because a high percentage, certainly of our patient probably don't do any sprinting, don't do any heavy lifting don't climb many trees and they probably don't run if, if they're in pain anyway or you know deconditioned. So, so the glutes, you know, we were taught back at college, there are extensors of the hip but really, um, you know, and lateral rotation of the hip, really they uncertainty - Iliotibial band, iliotibial band is not some kind of an extension of the, the Tensor fascia latae, attaches into tensor fascia latae, but eighty percent of it is fiber is going to the glute max. And so really the tensor fascia latae is the tendon of the glute max. And what it does as you load the leg with the flexed knee and a flexed hip, it prevents over pronation, so that exactly as you do when you're running or when you're squatting or lunging. And so the glute max is designed to prevent that overpronation under load and it's that

overpronation under the load which creates overpronation into the, into the foot, and into the big toe and creates that hallux valgus and the stress is through that first mtp.

and this was in the past is one of the big debates in gaits analysis as well. Is the overpronation causing the internal rotation of the leg or is it the internal rotation of the leg allowed which has been facilitated by weak glute, medius weak glute max which is causing the overpronation.

Yeah yeah yeah. I think the tendency has been to look at it from the ground up as, as you know, pronation of the foot is causing medial rotation of the knee, et cetera, all the way up.

And that's the, the, you know, I think in the slide presentation I've got an image of a skyscraper. And the idea being that that's the foundation's kind of concept, that the feet is the foundation's, got wonky foundations you end up with issues higher up. Um, but the problem is that that doesn't take into account how the structure is built. And we alluded to earlier, you know, the glutes are the most powerful muscle in the body. Uhm so, you know, if they're not functioning, then the loads that go through that leg, there's no way those tiny little muscles in the, in the, uh, intrinsic compartments of the feet can handle that kind of pronation so that, you know, I sometimes give the analogy, if you're a cannibal and you're given the leg, you know, and you're given the buttock, I'm given the hamstring, someone else is given the, the, the calf, and the last person gets the foot where the person that gets the foot is going to be right upset about that because there's no meat on the foot. And all animals have the meat around the hip because geometrically that works much better. But so therefore biomechanically efficient from an efficiency point of view, that works better. And that's why those muscles are a key to prevent overpronation down the foot.

So in terms of rehab then are you, are you are fan of giving lunges and squats for –

If appropriate, if the person can stabilize at that level but, but often they can't. Often they need to start with something like a foam roller, move up to something like a Swiss ball where there's more load going through the, uh, the feet, and then come up to single leg work, and then more dynamic single leg work and take it from there.

Over what period of time do you think that progression would take?

Well, it depends on many factors and the reason it does is that, you know first of all, you've got the um, willingness and the person to actually exercise. Let's assume that they're the model patient. They can make gains quite quickly within weeks. They can probably master most of those exercises, but that's assuming all other things are equal. Quite often those things that hold people back, like they'll get a niggle in their glute or they're getting a niggle in their back while they're doing the exercises or more often they won't be able to activate certain muscle groups because, for example, they've got a viscerosomatic reflex which is inhibiting the muscles. So we kind of mentioned this in the math of core stability, but the, the, the fact that the lower abdominal wall is primarily tonic means that it's very vulnerable to, um, being inhibited by pain, but also being inhibited by viscerosomatic reflexes. So someone's got irritable bowel, they've got premenstrual syndrome, then you get inhibition of the lower abdominal wall quite early on, and then that allows the pelvis to tilt forward. So, so when the pelvis tilts into an anterior tilt, then the femur roll medially, and then you get over pronation of the foot. So no matter how effective your exercise program is, if you're not looking at the health of their organ system as well, you could easily hit a brick wall part way through

Ok, time for some questions from some hostile questions from our audience

Oh, ok. Good, good.

Sally, you're probably gonna dislike me for saying this as a hostile questions, but we are talking about the chap who was one of the distributors for vibram fivefingers for some time. And she says, didn't Vibram get sued for making claims about the benefits of barefoot shoes?

Yes, they did. It is good. It's a good point. So they got, they got sued in 2013, um, and the lady that sued them, um this is, this is, this is an interesting point. So first of all, she was not injured, she sued them because her feet didn't get stronger, which is one of their claims, um when she wore vibram five things and how she measured this, um `nobody quite knows, but she said my feet didn’t get stronger. You said that these shoes will improve my foot strength. You haven't got any evidence to back it. And sure enough they didn't have any specific evidence that proved that wearing Vibram five fingers makes your foot stronger. So they lost the court case or they revised to uh, am figuring what the technical term is, but, but to, to settle out of court basically. Um, so then you have to say, well who in their right minds would take on a multinational company as, as an individual because their feet didn’t get stronger.

Was she connected to Simon Singh perhaps?

No. It turns out the company, the law firm that sued her also sued red bull for not giving you wings. So that gives you an idea of the mentality of the law firm. Uh so they hid behind her basically as, as you know, she's

sorry nobody did that did they, sued red bull because it didn't give you wings.

Yeah yeah yeah. Absolutely. Absolutely. And they won the case. So it was just, it just gives you an idea of their mentality a bit. Um, and you know, I think, I think, you know, the American sort of a pon chant for this, a litigious way of life has its ups and downs and the benefit of it is that she was right. Vibram didn't have concrete evidence that wearing a shoe makes your foot or wearing bearfoot shoe makes your foot stronger. So she's right. So you could say ok, fair enough. Correct. But at the same time, isn't that ridiculous that you can sue someone for your foot and they're not getting stronger. It's a little bit like buying a dumbbell and saying, well look, my bicep hasn't got stronger. I bought the dumb bell where you've got to use it, use it sensibly.

And we don't want to go down this particular rabbit hole too far. But what goes through my mind is how does she know that it didn't get stronger? I mean, she must have gone into. She must've gone into it deliberately trying to prove this point.

Well, the reality is that sh sh, I mean in my view, reality is she had no beef Vibram at all it's the law firm approached her to say, look, we need a face for this and this is how it works, you know? So she sued them, supposedly.

Stewart says does Matt disagree that orthotics are to be used as a help whilst exercises are taking effect.

No, not at all. No, I think that's exactly when they should be, just like a neck brace after whiplash, they should be used acutely and if you've got an effective corrective exercise program to go alongside it, then you should be able to rehabilitate, and not just the creative exercise program, but the problem that we have is that our society is so fixed, particularly the $90,000,000,000 per year sports shoe part of our society.

So fixed on the idea of having arch support. And that's important. I mean, even, you or I, probably, you know, you're buying shoes for kids. the first thing you think, oh, you know, is it sturdy, has it got arch support, you know, these things that we've been conditioned to think are important, but when you actually step back from it and look at it and then look at the research

associated with it, you find that's a crazy idea to try and support kids arches. Um, so, so yeah, you know, I think really people need to spend time barefoot as much as they can comfortably. And, and that was what attracted me to the five finger shoes that I knew a lot of this stuff prior to being involved with five fingers. But the reality is, you know for most patients, you say you really need to spend sometime barefoot, or they kind of shrug their shoulders and go, well, you know, I haven't got a garden or it's the middle of winter I can walk barefoot around the home. That's about it. But the five finger to me open the, the sort of horizons for footwear where people can get that benefit of being barefoot. You. Yeah. You know, outside of the home.

A couple interesting questions down here and um, one person has asked about her son who has an in-toeing gait, would five fingers help with that, now it could be useful to know how old her son is because actually an in-toeing gait is not unusual in young children because of the development of the hips, isn't it.

Yeah, yeah.

And what age should they have grown out of it?

Um by seven certainly. Um, but I'm not sure if there's an early. Uh, you know, by seven the infant gait cycle should be indistinguishable from, from an adult gait cycle. Um, but I'm not sure if the actual in-toeing component of that would, would change before that. It probably does a bit earlier than that, but some, certainly by seven it should've gone.

So let's say there's this young lad, is somewhere around seven and um he's in-toeing gait would the five finger help?

Potentially, potentially you know, this is the thing, you know, unfortunately you get some miracle stories of people and it might be a miracle for him. You - wearing five fingers and suddenly his gait's improved. And unfortunately, when people think that this is going to work as a miracle for everyone, and of course it doesn't, because the way it could miraculously help is that the sole of the foot is innovative by L4-L5 and S1 nerve roots. Yeah ok? Which just so happened to be the hip rotators, the key hip rotators, you know, glute, glute medium, glute max. So the sole of the foot is actually telling the nervous system when to activate glute medius and glute maximus.

That's, that's wired up that way. Um so by being able to feel the ground, but allowing the foot to pronate without any restriction, it could be that it switches on the glutes and makes them work optimally. It would be even better barefoot because when you put

something between your foot in the ground, you don't get near the, the stimulus even, even something as minimalist as a five finger. Um, so barefoot's always going to be better um-

With this particular imaginary child that you and I have got in mind because we don't know the full details. Um, how long would you try him for before saying, ok, that's not working. We need another approach.

I think I'll probably do at least eight weeks, but, but perhaps three months in the perhaps 12 weeks. That kind of periods. Um, yeah.

And uh, sorry, I have one question - Morton's neuroma. Um competing with Morton's neuroma. Go barefoot? Technically as I understand that if you flatten the forefoot it compresses the nerve a bit more and is therefore likely to compound the problem.

Well, it, it, it depends really on the status of their foot, on the status of their connective tissues um on- I would do this, this, um, credit card test and see if their foot reforms because what it's doing is it's creating this arch and not just the, the longitudinal arch, but the transverse arch again. And um, and so if that appears to help, then yes, I would give that a go. The other thing with morton's neuroma is that of course, because it's between the metatarsals, um, any, any lateral compression can, can uh compound it or aggravate it. So to get them barefoot can allow the foot to splay and take pressure off of the morton's neuroma. The problem being, of course, is if you overflatten and the arch. And that then creates compression. That's not going to be such.

Uh I just learned that the young lad that we were talking about 10. Ok. So you want to.

Yeah, I mean obviously there are genetic, uh, uh, factors, so things like, um, a femoral anteversion, it's worth looking at that from anterversion, tibial torsion, et cetera. So if there's, if there's a structural thing, then obviously five fingers is not going to change that. But if it's seems to be more motor control, then they- could well, help.

A question here that might actually lead you onto one of your slides. I think from what I've seen, um, the greatest concern of this particular question is that a barefoot wear additional- uh adds to the impact on the foot and therefore will increase the OA, so there you are barefoot walking or running, is going to get greater impact on the foot-

Excellent. Excellent. So I've got some nice slides on this so um-

I didn't prime them.

No, no, no, no. So research by this chap Lieberman. Um, so this is the slide here. This is a paper that was published in nature in 2010. And um, what Lieberman showed in this research paper was he took a group of Kenyans uh that had grown up barefoot and he took a group of Kenyans who had been partly shod some of the time and, and then Americans that of course have grown up shod. And what he did was he, he assessed them running across the force plate. And what he found was that the kenyans that have grown-up barefoot, virtually all of them struck this force plate with a forefoot strike. Ok.

Um, is that walking speed?

NO, this is running, this is running speed. The ones that, um, you know, were mixed um partially shod - It was less com- or it was less come off the forefoot strike, but it was still, the majority of them is something like 60 percent forefoot strike when they're barefoot. But the Americans, they tended not to, to, to forefoot strike at all when they're in their running shoes. We, so that's kind of their natural states, if you like, what they used to. So then they switched state. So then they got the Americans to go barefoot and they got the um, uh, Kenyans to go shod. And what they found was the Kenyans start to heel strike and the Americans start to forefoot strike. Ok. So, well this was really fascinating about that is that first of all, it shows that this is not a motor program in the brain because they've been running a certain way all their life. This is not, um, uh, related to um, genetics or even to biomechanics because some people would say, oh, well, you know, Kenyans have different biomechanics to Americans and all that kind of thing. Well, no, the only difference, the only difference was the shoes. Ok. And so it just shows the impact that wearing a shoe or not wearing a shoe has on the way we run.

Other, other than differences in biomechanics which would occur through not being shod, is there any evidence at all that Kenyans have different biomechanics to their occasions or Americans or shod Americans or otherwise.

There are discussions about how high the gastroc is in the calf. And the higher the gastroc is, the more efficient the runner is, it goes because it got less weight lowering the calf and tend to find that with Kenyans, they have a high gastroc. So that's one thing, but I think a lot of it's more biochemical, so it's more to do with their capacity to [inaudible]red blood cells and this kind of thing. Um, so, uh, anyway, you know, to talk a bit more about the shock. So we basically, what we're saying is that when you're in cushion

shoes, you tend to heel strike no matter where you're from, no matter what your background. When you're in barefoot, then you tend to forefoot strike. And so what we can see on the slide here, you can see that, um, people that are used to a running on the forefoot. So it's right down the bottom here, people are used to running forefoot strike. They have a nice smooth curve of, of strike, um, without any kind of impact transient. People that are used to running in running shoes, they have what's called an impact transient which you can see here in cases, this is this little spike here and that impact transient is injurious. It's like a kink in a wheel. It's like, you know, you going to joonk, joonk, joonk with each step. And so perhaps a better analogy for that is it's like running with the pole vault and so you're hitting your leg into the ground and vaulting over each time, so you get that deceleration force and then you loop over the top, but then people that were barefoot and heel struck, you've got an even bigger impact transient. And this is, this is where the danger is for people that want to start running in Vibram five fingers or completely barefoot is that they still continue to heel strike. Now why would that be? Why is that the case that some people still heel strike? I think it's just like any other walk of life you've got different levels of intelligences so the, the theory of multiple intelligences. Some people are very, uh, musically intelligent. Some people not so much something kinesthetically intelligence Some people not so much. So I think people that perhaps don't have the kinesthetic intelligence or body awareness, they might still run along heel striking even though they're barefoot. But the majority of people tend to forefoot strike the moment you take their shoes off ok. Um you can-

And this is walking and running – that they would do that?

This is running, this is running. Yeah.Um, and so on this slide you can see that the, the shod runner, so skilled runner is the one that you see uh down the bottom here barefoot. The shod runner is the one that you see here obviously with the shoe on and getting the impact transient and they have two times the load of the skilled barefoot runner. Ok? Uh, but the unskilled barefoot runner well they have seven times the load of the skilled, barefoot runner. So, so there is that risk. Uh, you know, again, it's not a panacea if you'd go barefoot, doesn't suddenly mean it's everything's good and cushty and you've got to make sure your technique's right. And you actually touched on something earlier, which is the cadence. Cadence is absolutely key to getting the technique right. So the higher the cadence, the easier is to forefoot strike and the lower the impact.

So therefore the shorter the sort of the strikes .. which would increase the cadence, presuming, But you talked a little about running, in walking, what's different or they're not still forefoot striking or there's just not been researched?

I don't think it's been researched as much because the loads are not that significant in walking. Um, and so there's an assumption that there's not as much uh injury and, and probably you know reasonable assumption as well, based on the epistemological

I've been calling them vibram all evening and you've clearly been quietly correcting me by saying VIBRAM every time you say-- oh, so you're wearing your VIBRAM five finger shoes at the moment. When you walked here, are you forefoot striking as you walk or?

No, no, no.

Ok.

So if you run you would have done-

Yes. Yes.

So it's ok to walk what I would call normally in-

Yes, I think so. I think so. Yeah. And one of the things that's interesting is if you've got your ipod in, when you're, your ear pieces in, you know, you're talking to someone, if you're jarring too much in here straight away because of the, because the moving in the ear. So thAt's quite a good indication that you're hitting the ground too hard. It's like a kind of feedback, um but a better feedback. Uh, that's more natural, let's say, um, is to watch the road signs or the number plates if you're in a town environment or if you're in a forest environment, look for sticks and roots because you don't wanna step on any of them. Um, and if you can focus in on them and be sure that they're not snakes as you, as you're walking or running along, then you know, there's not much vibration going through your head because you only have to, if you just tap your head like this, just try and focus on something just a few feet away. It's very difficult to see it, particularly if you're running, you Know, so, so the point being that if there's a vibration going through your heads, yeah, then you can't focus on what's coming up.

Ok.

So it's a, it's a useful kind of check for people.

Um, you mentioned, crikey, we've only got a quarter of an hour left. Um you mentioned earlier on other shoes and Robin has asked do you recommend other

good, minimal, minimalist other than five fingers is normal looking minimal shoes. I have this have the same problem with the ball of my foot pain when I try thin, minimal, shoes. So a couple of elements to that question.

So first thing, yes, there's lots, lots of minimalists brands and Vivobarefoot is the one developed by Clark's, the son of Mr. Clark. Um, and so they're good there- Uh they they make good quality shoes. There's another one called Lems which is a good quality brand um-

And what makes them good quality?

Just just through, through testing, you know, they, they lost some of them, obviously I won't name names, but some of them have a bit of reputation for falling apart a little bit. Um, and uh, now who, who is the other brand- is a very good brand Merell vapor glove. So if you're looking for running, Merrell vapor gloves as supposed to be very good-

Ok, so you're not going to name the names of the brands that fall apart, but if Matt didn't mention them they fall apart quickly. Vlad here again, says all for barefooting-

We didn't finish that one, so the ball of the foot pain. The um cadence will work beautifully for that. So working on cadence, assuming she's running, I'm not sure if she's running often or just walking around, um, but, but if it's a, if it's a running question, then you can get very simple devices for your iphones these days, which just a metronomes, free downloads and it can just tap it a certain pace. You want to go between about 180, 190 um most people run 170 to 180 in a cushion shoe. Um, but you want to go a little bit above that probably 180-185-

It sounds counterintuitive, it sounds as if you're using much more energy-

You know, you're more tip tapping along rather than, um, rather than bounding -

but not interfering with the momentum by blocking it with a long stride –

No, no, we have to put your foot down so quickly to, to, um, to stay in rhythm with the metronome, the, you can't get these overstriding. So if we look at this slide just below here, so this is what typically happens with a heel strike is you will overstride. So the foot goes out in front of you ahead of your center of mass. And that's what causes this ground reaction force. And the impact transient, you see up on the graph here, ok, when you forefoot strike, what happens is, and

you know, when you increase the cadence, what happens is you place the foot down again, normally just ahead of your center of mass, but it's on the forefoot. So by the time that heel moves down to the ground, which is in the second image here on the right, then your center of mass has moved ahead of your ground contact point, which means that the impact there is no impact transient. You just see a nice smooth curve. Ok? And so that's, that's what you want to aim to acheive. So increasing cadence will help with that.

Ok, Vlad, he says all for barefooting the trouble comes from the fact that it doesn't appear professional to the outside world. Difficult to appear professional without a nice pair of shoes. What solutions are there for this, Vibram Five fingers are very much not waterproof he says.

Yes, that’s true. Um solutions will be some of the other brands I just mentioned.

You mentioned leather ones before we came on air.

Yea, yeah I had some leather five fingers but the, but the um, the, the um Vivobarefoots and and the LEMs do basically looked like shoes and some that looked like running shoes as well. So I would go with them if you want a minimalist shoe for work.

We talked, again before we came on air. You talked about different thicknesses and soles.

Yes.

And I would be very worried about treading on that single piece of gravel, which will do me some mischief when I'm walking because if I'm still heel striking and I hit that bit of gravel for very thin soles. Is that not going to give me injury.

It is, it is. Yeah. So you know, one of the things I love about running in the five fingers or barefoot is that it turns the whole event into something more akin to a sport because you have to focus every second of the game otherwise you could lose. All right, so you playing basketball, playing football, the person that concentrates for the whole game is much more likely to win the game. And the person who drifts off part way through, and it's exactly the same with barefoot running now in a pair of running shoes, you can drift off and you can run with your head in the clouds. When you're barefoot or minimalist, you have to be completely engaged and you have to watch every step. And the moment you switch off, that's when you'll hit the root that's hidden under the leaves or whatever. And it hurts. It absolutely hurts and it can bruise the sole of your foot. But the whole point of

the minimalist shoes is that you should avoid cuts, you know, so it, it, you can still bruise your feet and you learn pretty quickly. Um, ok. So yeah-

A lot of people will say that they use their walking time for thinking and therefore they don't want to have to be worrying about where their feet are going.

So yeah, it depends on- Yeah, absolutely. It depends on what we enjoy. I feel much more invigorated from running off roads barefoot than I do from running on the road in trainers for example, you know, I just find that like a means to an end, it's like, can I get from a to b? Whereas, and Phil Beach actually, uh, you know, he's quite well-known Osteopath. He has a great analogy for this. He says that, you know, running on the road in, in running shoes is like fast food. Whereas running off road barefoot is like fresh organic salad, you know, it's like you've got real sustenance from one and the other is just calories, is either calories in from fastfoods, calories out from running on the roads. So it's, you know, so a bit mundane and not nearly as engaging.

Your foam roller test We haven't talked about supinating feet.

Yes.

In conventional wisdom oare feet, which don't absorb shock and are difficult to manage in most cases other than by putting cushion on them. The question was actually use your foam roller test any good for or more exercise, any good supinating feet. But-

Yeah it is. It is. Uh, you know, it doesn't always work, but, um, it, it quite frequently. What you'll find is that you get the same effect. In fact, maybe we should have done that on your, on your right foot. Which was oversupinating a little bit. So my understanding of over supination is that what you've got going on there is the intrinsic musculature is generally weak or inhibited and so you are over recruiting the extrinsic musculature. So essentially things like the tibialis posterior, tibialis anterior, which is one of the reasons that oversupinators are more prone to, to shin splint type pain, uh form of a general term.

Um, and uh, and also of course stress fractures as well. So I think with uh, with uh oversupinator, that's certainly a case where I want to work on mobilizing the foot and making sure that all of the joints, the foot are working effectively, but they're not going to work on the intrinsics of the foot. So my understanding is that oversupination or overpronation are quite similar at, at the foot of the big difference is, is that both of them have, both of them have intrinsic switcher inhibited or weak, but the

overpronating foot has extrinsics that are inhibited or weak as well.

Ok. Yeah.

Um someone has asked whether they do a steel toe cap version of barefoot shoes simple answer to that I reckon is no. Would you recommend barefoot walking or barefoot shoes for a five year old toe walker?

Um, yeah, I would. Yeah, I think.

Because you think it would be beneficial for the toe walking or just because it's beneficial generally.

Well, I think, you know, you've got as an information system there, you know, so one of the things I talk about sometimes is that if you look at the homunculus, you know, you've got these huge hands, huge feet, huge tongue, and um, you know, they're all formed from embryologically from this ridge of tissue called the apical ectodermal ridge and um, you know, they're designed to be able to give us huge amounts of feedback from the environment and just like we were saying earlier, you know, if you're not getting effective feedback, how can the muscles know what to do?

So the better the information coming into the nervous system, the better the information going out at the nervous system. So I'm not saying, again, it's a cure all, but it is likely to be moving them in the right direction. So,

Um, I don't, I don't know who this questionnaire is, but they ask, um, whether it's the best option for people with hypermobility, Ehlers-Danlos syndrome. And would your answer vary if it were hypermobile child starting often barefoot shoes or an adult who had been shod for a long time.

Um yeah, I would say that, you know, with hypermobility what you're looking at is the passive subsystem. The joint is compromised. So therefore we know there's an issue there with the passive subsystem what we need to work on Then is there neural subsystem and the active subsystem to go back to Panjabis model. So how do we do that? Well, we've got to give them maximal proprioception. We've got to make sure. You know again, another thing, we talked about, joint movement and joint mobility earlier in the talk and what that joint movement between those 33 joints is providing information to the nervous system. As soon as you start to block that by wearing a relatively rigid shoe, you're getting no information to the nervous system. So the more information we get coming in, the better the information coming back out to control the foot to control the level of -

If you, and if your, what you've said is correct, um and as we've heard from previous speakers, actually one of the best ways of addressing hypermobility, Ehlers-Danlos is strengthening muscles because that's what provides the stability. Then actually allowing the feet to gain in strength. Yeah. This is going to help.

Yeah. But you know, like all of these things is the process, you know, you need to start on the grounds and you build up. So you gradually ascend to take them back to full function again to say to someone with hyper mobility or you should buy a pair of Vibrams and start running in them. It would be a terrible idea. Um, but to build up to it is a great idea.

I've got some questions with names attached. I'm going to, I'm going to read them out before the others and this one comes from Annabel. Thank you Annabelle. In a patient with tibialis posterior tendonitis. What's the best way to speed up recovery and prevent recurrence of it? Would barefoot walking and running introduction help to rehabilitate the condition or rehabilitate the muscle?

Potentially um, you do use the tibialis anterior and posterior- Uh, well, sorry, I should say you use the tibialis posterior probably more when you forefoot strike then you do tibialis anterior because the foot's plantar flexed and, and um, because of its positioning, the tibialis anterior is preventing overpronation of the entire foot, whereas the tibialis posterior, because it's more immediately placed, um, it's more preventing the actual collapse of the arch. So when you're forefoot striking tibialis anterior becomes more stressed. So you might think, no, this is a terrible idea, but it actually ties in with the whole story around Achilles injuries as well. Um, because when you load, imagine you know, you, you pointed your foot down to, to load uh on the forefoot as you're running and so the arch gonna load, it's going to load eccentrically. And often it's the eccentric loading portion that is used in various rehabilitation protocols to rehabilitate muscles.

Right? And so you, th th, I don't know if you know the story behind the Achilles problems because Achilles problems often come up with this forefoot strike is suddenly you're loading the calf. I think one of one of the questions has mentioned that earlier. And so yeah, the Achilles may start to get sore or the calf may start to get sore because you started this forefoot striking. So there's the adaptation that's required for that of course, but the whole discussion behind Achilles rehabilitation and this eccentric loading protocol, that Alfredson's came up with in 1999. The story behind it was that Alfredson is an orthopedic surgeon that specialized in the Achilles surgeries and um, he had 20 people in his books that were booked in for surgery

because their Achilles pain was so bad. They were all runners. And um, he himself also developed Achilles problems. He was a runner and it got to a point where he was so desperate that he thought, you know what? I know that in training, when you eccentrically load something, you damage it. Ok, that's, that's. We know that through, through muscle physiology, maybe it's the same, with the tendons, if I try and eccentrically load my achilles, hopefully I can just rupture it. I'll get one of my colleagues to fix it, fix it up, and then we can be done and rehabilitated. So he was jumping off things. He was, he was putting weights on his back and eccentrically loading, trying to snap it. And what he found was that ultimately it got better. So then he thought, well this is interesting. So he, he's, because these 20 people were booked in for surgery anyway, you thought, well, worst case scenario is that they just get moved forwards, you know, if that, if they snap their achilles. So I'll just bring them forwards in the diary, you know, so he gave his achilles protocol to all of these runners and um, every single one of them rehabilitated and so he published a paper in 1999 and-

The same should apply then for tib posterior problems.

Theoretically with tib posterior, but, but going back to the achilles and the forefoot, strike what I think Alfredson did was he inadvertently found the missing phase of the gait cycle because only since the 1960's have we been running with a heel strike.

All right.

I mean obviously become one with the heel strike on sand or wet pad or something like that. So it's not say that humans can't do that, but on firm surfaces we, you know, basically most of our running has been on our forefoot strike for 4,000,000 years. Ok. And so what that means is we've been loading the achilles eccentrically with every strike that we take suddenly in the last 40 years we've started heel striking, which means no eccentric load to the achilles. And now we've got these achilles problems.

We've got a couple of minutes at the very most and we've got loads and loads of questions. So we're going to have to test you after the program finishes. Um, but a couple with names, Terrence says, surely it's possible to heel strike and have center of gravity over the ground contact point, is heel striking and overstriding that – is it heel striking and over striding that is potentially harmful, which I think is what we said -

It is not very easy to heel strike under your center of mass. Yeah. Th, what is, what buys you the time of the forefoot strike is the, um, dorsiflexion that occurs

because you start with plantar flex position and as you load down, your body's moving over the top. So that's what. So that's what minimizes the impact. Yeah. Ok. Let's call it, I think it's called angular momentum.

Um Stuart has asked whether it isn't the case that most overpronation issues are caused by faulty bony architecture.

Uh, I don't think so. Um, and the reason I don't think so is it partly because I've never read that, but partly because the foam roller test is almost a hundred percent. I've only had two people in my entire career who haven't got a full recovery of their arch. And so, you know, practically everyone with pronation and you get them on the foam roller and, and their arch returns instantly.

Plantar Fasciitis, another question?

Plantar Fasciitis yeah the same as the achilles. Same concept. So plantar fascia accounts for 17 percent of your energy absorption, in gaits in running gates. The Achilles about 35 percent. So the moment that you start heel striking you negate, those two functions, ok, you've just lost your planter at the effect of the plantar fascia and effect of the achilles, so you've halved the impact absorption of the lower limb by heel striking straight away. If you forefoot strike then you eccentrically load the plantar fascia as you, as you land and eccentrically load the Achilles as you land as well. And that… that tension that whole posterior system that then allows the hip extension and pushes you forwards. Um it ties in with uh. Actually myers posterior was, he called it a superficial back line. So the anatomy trains line

Yes, yes, of course.Um I'm going to give you one more - We're overtime, but I'm gonna give you one more question. Um, I have a client who is a pronated has weight-bearing at the outer side of the foot, has a history of stress fracture of the fifth metatarsal. How would you manage that in five seconds?

Is pronated and has weight-bearing on the outside of the foot? That sounds difficult. Uh, yeah. I don't know-

Unless, unless that's a compensatory mechanism.

Yes, yes. Um I will probably use the foam roller, you know, I would use that thing and try and get those muscles activated. It's um, there's a great article on the intrinsic muscles of the foot which I'll give to you and you hopefully can make available to her on so she can understand that-

Please. I'd love to. Matt, we're going to make as much of this available as we possibly can to everybody. We

will download the charts at the end, which we didn't have time to cover, but hopefully you'll just give me a bit of explanation that I can put on the website. I've got about a dozen questions which I haven't had time to ask you, which I'm going to feed you afterwards and I hope you'll be kind enough to feedback on those,

Yeah, that’s fine, that’s fine.

But we've gone through far more than I expected to. Thank you very much. I'm looking forward to the next one as well because these things are always fascinating discussions and that's all we've got time for this evening .What would like you to do is when you get your certificate and you find yourself on your profile page, you have the opportunities to give us a review and of course I would love it if you gave us five star reviews, um but if you feel we only merit, four, then be honest.

Um, it would be lovely if you could give us those reviews. It's very helpful for us in terms of attracting new members to the organization, and new members means we can do so much more for you.