Academy of PHYSICAL MEDICINE

Transcript

The TMJ – How It Affects the Hamstrings With Matt Wallden

Cast List

Steven Bruce	SB
Matt Wallden	MW

SB: Now what we've got for you this evening is a revisit by one of our favorite guests, Matt Wallden. Every time we've had Matt on, and it's been I think half a dozen times now, we've had so many requests for him to come back. And I'm delighted he's here to join us.

We're going to be talking about the TMJ and the hamstrings quite apart from all the other things that the TMJ affects. But just a quick recap on Matt. He's been an osteopath for 22 years. He's an associate editor of the Journal of Bodywork and Movement Therapies and I got that title right this time. And he's also a faculty member and head of education at the Chek Institute, so he knows his stuff.

Matt, fantastic. Really fantastic having you back with us and I got all that right.

MW: You did.

SB: For once. Just remind people what the Chek institute is because ...

MW: So, yeah, the Chek Institute is a continued Professional Development Institute in the US. And essentially, the simple way I describe it is that it helps to bridge the gap between what's done in the personal training and strength conditioning world and what's done in the clinical world. And so it's essentially Chek practitioners have a very holistic exercise, philosophy and understanding. And so it fits really well with what we do as manual therapists.

SB: Okay. I suspect it has a bearing to some extent on why you're the experts on the TMJ.

MW: Well. Yes. I wouldn't quite say I'm an expert, but I have applied obviously, my understanding of the TMJ as part of my Chek training. It comes up in the third level of the training and through a model that Paul developed, which I think we'll probably look at a little bit later. So Paul being Paul Chek who was the founder of the Chek Institute. But so yeah, I essentially had an early interest in it in my career around 2001, because I'd just started on the Chek training at that point.

And it just so happened to coincide, being fairly early in my career. I was going to one of these breakfasts business meetings and there was a guy there who was a dentist and it turns out he was a TMJ specialist. So I thought, well this is a good guy to get to know, because I just started to realize how important the TMJ can be in manual therapy.

SB: Can I interrupt? How much training did you get on in your undergraduate training as an osteopaths? Because I seem to recall getting about an hour.

MW: Yeah. Maybe a guest lecture or two or even not even a guest lecture, I think it was a single lecture or perhaps we weren't covered it twice or something throughout the four years. But so it wasn't an in depth amount of training in the undergraduate. But so it turns out this guy that I've met at the breakfast business meetings, was essentially the founder member of the TMJ study group for the UK. And was one of the leading TMJ specialist in UK and Europe. And he just lived a couple of miles down the road from me.

So befriended him and we exchanged lots of patients over the years and still do. And so I actually, some of the slides I've got to share are his slides and yeah, led me down the path of really working with more and more TMJ based patients.

SB: I'm intrigued to know what dentists actually do with the TMJ, because clearly they are working closely in that area all the time. But I've spoken to a number of dentists who wouldn't really class themselves as being expert or even particularly knowledgeable about it. Was he an oddity?

MW: Yes. I would say he was. If you speak to him about it. I think at the time when I first started going on to his study group, I think they would get a turnout of

about 20 or so people, but they had a membership of about 70 or 80. And he said, "That's out of 23,000 dentists in the UK." So it's a very small fraction of them that have this interest. And it is a controversial area, because certainly some of the research behind TMJ dysfunction seems to implicate dentistry in the causation of TMJ dysfunction.

I wouldn't say that that's 100% true or that we know that for sure. But what we do know, is that one of the strategies that's been used when we get overcrowding in the jaw, which is a very common finding, is to extract teeth. And that's the simplest and the cheapest way to address it rather than brace work. And of course that takes a long time as well. It can take know 18 months, two years.

So the challenge with managing overcrowding in that way, is that the moment you pull out is normally a premolar that's extracted. You get about six millimeters of jaw retraction. So essentially you lose six millimeters off of your upper arch nominators it's normally the maxillary arch, that's the issue. And so then you end up with a smaller space, because the way the jaw should sit, of course it's just inside. So the mandible is just inside the maxilla.

So if you make the maxilla smaller, then of course it brings the jaw back and that pushes back against the TMJ itself and in particular some tissue called the retrodiscal tissue, which is pain sensitive.

SB: Right.

MW: So that seems to be certainly one potential mechanism. And if you speak to these TMJ guys, they would say possibly the primary mechanism for people experiencing TMJ pain. So that's where it gets controversial, because it's questioning a fairly mainstream dental practice of extraction of teeth. But you can see why that's happened.

SB: Being a bit heretical, do you think there's ever any role or any implication that manipulation might also cause TMJ problems? I mean, if you're doing a chin hole for a cervical manipulation, for example.

MW: I would say it's possible. Like all parts of the body, the TMJ is pretty robust and that certainly doing things like, first of all, a macrotrauma, so a big impact to the jaw. Falling off a bike, hitting a jaw, being hit in the jaw by punch or whatever. Those are things that can certainly cause trauma to the TMJ. But similarly you can also get trauma if you, let's say you're a graphic designer and so you're doing a lot of mouse work and your habit is to lean over to one side.

And you can create macrotrauma or perhaps better or more accurately described as creep in the connective tissues around the two joint capsules. And then that can potentially cause issues as well.

SB: Ain't that a form of repetitive stress?

MW: Exactly. Yeah. So there're a few potential mechanisms from macrotrauma to microtrauma, but also posture as well. So posture is one thing that will certainly affect TMJ function. So when you have a forward head posture, which of course is the most common posture, to find in a modern cohort of patients. It disrupts the tension relationships between the muscles at the back of the neck and the muscles at the front of the neck, which includes the suprahyoid muscles, which are all part of the jaw function.

And of course the muscles of mastication as well. So that is another potential mechanism for how TMJ dysfunction can come about as a result of poor posture.

SB: Yeah. Is it worth us revising the anatomy as all?

MW: It could well be. First of all, I've got an image which I think it's from actually the jaw reck. I think they're called jawreck.com the study group I mentioned. And this is their head page on their magazine that they put out. And I just think it's a nice image, because it just shows just how close the TMJ is to these pretty vital structures. And so it's quite a dramatic image but one of the things that we know with TMJ issues, is that they can cause a lot of sensitization of the nervous system.

So that's a nice image there and we can talk a bit more about that later. But another aspect of this, is that with of course the jaw is fed by the trigeminal nerve. The mandibular branch of the trigeminal nerve. And one of the figures I've heard, and I would question this figure, but I've had 80% of the afront drive to the brain, is via the trigeminal nerve.

And that sounds way too much when you consider everything else coming back in from the organs and from the spinal cord. So I think that's probably not correct. But I think there is a high level of afront drive from the trigeminal nerve, because if you think about where that trigeminal nerve is on the body of essentially the body plan. So if you think of us, and the body plan is essentially the main architecture of the body, then it's right on the front of the body.

So if you imagine, we have the same body plan as fish and that goes right the way up through lizards, mammals, all the way to where we're at.

SB: And I should again, just interrupting you and apologize. I should just say that. What we will do unusually, what we will do is we will put your slides up on the website tomorrow for people to download if they want them, what to look at if they want them. So although this is going to be perhaps a bit difficult to see on an iPad or an iPhone and you're going to run through it anyway, but it will be available on the website tomorrow.

MW: Sure. Yeah. I should mention, this is an image from Thomas Myers work in the Journal of Body Work and Movement Therapies. But all he's really illustrating here, is that you've got this three components of the embryology. So you've got the endoderm, the ectoderm, exoderm and the mesoderm. Yeah. So there's three core components that run longitudinally down the access of the animal as it were.

But I just thought it was an interesting illustration, because he's showing the face at the front. And that's of course where the trigeminal nerve is feeding. And it's the part of you that's moving through the fluid medium as a fish or through air as a land animal, which when it's put in the fish context, I think it makes you realize how important that front part of the animal is, and why it would be so sensitive and aware of its environment. So that's why that one's in there.

But yeah, I'll just find a slide of the TMJ, because I think like you say, to go over the anatomy could be quite useful. It's gone back to the wrong one. Let's just get that back. I think I can just flip through actually. Maybe this is the quickest way. So what you can see here on this diagram, you've got at the top there, that's the the disc. So that's illustrating where the disc is in the joint. This is the lateral collateral ligament B. C is the retrodiscal material.

SB: We've just got a shadow of the condyle coming through here.

MW: Yeah. That's right. And of course that's the head of the mandible. And then you've got the two heads of the lateral pterygoid there. So D is the upper head and E is the lower head. So the interesting thing about, that is that the D actually inserts into the disc, so actually draws the disc forwards that's its role. And E, the lower head of the lateral pterygoid, is designed to pull the mandible forwards at the same time.

So when there's dyssynergic firing between those two, they're not firing at the same time, then that's part of the mechanism that may pull the disc out of place as you're opening the jaw. So this is one of the things that we can actually work on as manual therapists. We can get in there, we can't access the whole lateral pterygoid, but we can access parts of it just under the zygomatic arch there, or from the outside. And then inside the mouth up in the top corner as it were.

So feeling for tender points and spasm and so on there, is a useful clinical approach, but so that's the basic anatomy.

SB: You mentioned the retrodiscal tissue, which is being sensitive. Have you got an illustration of that as well?

MW: Yes. So this is essentially the retrodiscal tissue here and you can see that it's illustrated as though it's got blood vessels in it, which it does because they also pain sensitive. And if you compress them then that can cause problems

in terms of pain and ischemia. But this is, yeah, just the jaw beginning to open. So you see that the disk is being pulled forwards and the mandibles being pulled forwards and this retrodiscal tissue, is elastic in nature. So it provides a certain amount of resistance to the forward movement.

Of course, I think a lot of people, if they look at a skeleton, they just assume that the jaw hinges open and closes, but it actually does dislocate and translate forwards, which I know most of our viewers would be well aware of. But that's the role of that lateral pterygoid in pulling that forwards. And one of the interesting things about that clinically, is that what stimulates that motion, is actually the anterior temporalis.

So the anterior temporalis is like the transversus abdominis in the core, in as much as it fires ahead of the initiation of opening.

SB: What's it's rule then? Because you're going to have routine issues, it's firing ahead of it. What's it actually doing in this instance?

MW: What it's doing is, it's stimulating fibers. So actually it's fibers blend with the lateral pterygoid. So as it contracts, which essentially you can train that by raising your eyebrows or grinning like you look like the joker and a little so upturn of the mouth.

SB: You do that very very well. That's quite scary.

MW: Thank you. I've been practicing a lot.

SB: Jack Nicholson stars…

MW: I actually in one of my TMJ presentations, I have Jack Nicholson as the joker. I say, "This is the exercise you should be doing." But so what that does, is it pulls up on the, so the anterior fibers of temporalis run down and they actually insert into this lateral pterygoids. So as that engages, what it does, it creates a spindle cell stimulation, then you get an engagement of the lateral pterygoid, and then it draws forwards. With people having challenges with disc injuries or disc displacement, one of the things that we can do is we can assess the temporalis.

And quite frequently what you find with temporalis is this trigger points tend to points round the back of the temporalis, sometimes in the anterior part as well. But if there's these tender points at the back based on the traditional understanding of trigger points, which is all up in the air of course. But the notion there, is that trigger points are neurologically thirsty. So they draw a neural drive into the tissue.

And if that's the case, then what they could be doing is drawing neural drive away from the anterior part. So clinically I've worked with that affair a bit over the years. And it seems to be helpful in restoring normal joint

mechanics. So that's the initiation of opening. And then when you go a step further, then you can see that the head of the mandible has moved further forwards, the disc is moved with it. So those two heads of the lateral pterygoid are working synergistically, which is ideal.

SB: This all looks very ligamentous, this in the diagram.

MW: It is. Yeah.

SB: I don't know how distinct it would be on dissection.

MW: Yeah. Do you know what? I haven't dissected a TMJ, so I couldn't say for sure, but it is. It actually forms from mesenchyme, which has interesting enough, a connection into something called Pinto's ligament. So this guy Pinto was an anatomist who did a lot of dissections on the TMJ. And what he found was that, even though if you look up into his ligament in grays or something like that, what you'll find is that it says that Pinto's ligament is formed at the, I think third month IU.

And that by the time the child is born then it will have been reabsorbed and disappeared. But what it connects is it connects the disc here back into the malleus in the inner ear. So it actually connects directly the disc to the inner ear. So what Pinto found was that, there's still connected tissue connection between the disc in the inner ear, in quite hyper sensitive people.

I don't know the exact percentage. But what the TMJ specialists talk about, is that disc is one mechanical rationale for why TMJ dysfunction may cause tinnitus, because there's this very close association between the two. But yeah.

SB: Have they postulated a mechanism for that to happen? Is what we want to say. There's because there's a ligamentous connection, but how does it generate the appearance of noise?

MW: Well. It would be alterations in the muscle tone, particularly in the lateral pterygoids, which is creating alterations in the tension in the connective tissues from the disc back into the inner ear. And that then that would affect the vibratory rates of the malleus. So that's the postulate. But the other thing with this images, you can see, so you've got elastin. High proportion of elastin in either side of this retrodiscal tissue. And so that's really exerting the strong posterior pull so that when the lateral pterygoid relaxes, it draws the jaw back into place.

So that's how things should work as you open the jaw. But when things go a little bit wrong, then what happens is that the, so in this instance you might have increased tone in the upper head of the lateral pterygoid. So it's pulled the disc forwards and decreased tone in the lower head of the lateral

pterygoid. So it hasn't pulled the mandibular head forwards. So then you get essentially the head slipping backwards and you get a pop.

And then ultimately when this one does kick in, you can get it popping back over again. So there's a reciprocal click. So it goes in both directions. And of course the pop occurs because the disc and the joint is biconcave. So just like a blood cell, red blood cell. But so we've got a few bullet points there as well. And the most common direction for displacement of the disc is, is anterior and medial.

So that means that this scenario is relatively commonly found. And this is related to trauma to the lateral collateral ligament that we saw in that first slides. And that of course can be from a blow to the jaw from creep and leaning on the jaw too much on the one side.

SB: And what we call here, is the condyle pressing on all that elastin that you were pointing out earlier.

MW: Well, so yeah. So the elastin is the thin bands either side, but it's the retrodiscal tissue in here, where you've got all the blood vessels and the nerves that is particularly painful when it's compressed. And it can be exquisitely painful for some, especially if there's a degree of inflammation there already. And some of these TMJ patients are suicidal with the pain, it's horrendous for them.

So it's something that is certainly not to be taken lightly and on that front, I mentioned patients that can become suicidal. I have had a patient who I recommended to see this chap I was discussing at the beginning of this TMJ specialist. And like a lot of specialists, he's very expensive. The part of the reason he's very expensive, is that to do TMJ work properly in his opinion and to do it safely, you need a dynamic MRI scan before, to assess what's going on during the process. To make sure your interventions are taking the jaw in the right direction, and the disc in the right direction.

And then probably again at the end. So they're seven or 800 pounds each. So you're already a few thousand pounds into it without his time, without his dentistry work, brace work, et cetera. So they tend to be several thousand pounds to work with a TMJ specialists like that. But there're other-

SB: But you know what actually they will be doing. Let's say you've got an anteriorly displaced disc.

MW: Yeah.

SB: What are they doing to overcome that increased tension hypertonicity of the pterygoid?

MW: I think it depends a lot on what they think is the causative factor behind it. And most of these guys work with osteopaths, with chiropractors, with physios. So they have manual therapists there, assisting them with the connective tissue issues, the tensions in the muscles. Often they'll have a cranial therapist working with them, because they find that seems to help a lot. So they're quite open minded and quite I think expensive in the way they work, holistic.

A lot of them are very good with nutrition as well, because there's a whole thing around, fillings and mercury and all that stuff. So a lot of them are into detox and all these things. So they tend to be ... a lot of these guys are quite, I would say, yeah, alternative in their views. They're not your mainstream dentists.

SB: Which raises the obvious question about evidence doesn't it?

MW: It does.

SB: As soon as anyone says the word cranial or the word evidence crops up in my mind, not because I'm anti cranial, or just because that's where so much of the criticism of our professions comes from.

MW: Yeah. Absolutely. And I think, the reality is that these people are literally, so they're seeing TMJ cases. Perhaps you know how regular dentists see people, it could be 20 cases in a day. And so they're using their empirical experience to say, "When I refer to this practitioner, that seemed to really ease the symptoms, ease the pain, or progress the dental work quicker."

And so I think a lot of them have found that cranial has been very beneficial, because it's certainly not just one or two of them. This most of the group work with the cranial practitioner. So like you say, there's probably no systematic reviews at this point. But that's because it's still quite a fringe practice within dentistry itself I'd say. So there was something else I was going to say. Yeah.

So ultimately, what you end up with is a thickened posterior capsule of posterior disc there. And then that can enhance the clicking. Because of course you're bunching the tissue forwards because this mandibles stuck behind. So that's normally quite painful. Sometimes not too painful if there's not much inflammation, but that's normally when the patient will be presenting to you. And may be incidental, I think for a lot of us as manual therapists, these things are a secondary thing.

They're coming in with neck pain or back pain or hamstring injury like we mentioned earlier. And this may be an incidental finding or if you've got an awareness, you may go and screen the TMJ, particularly for neck pain. I think it's very important, but for other parts of the body as well.

SB: Does this every resolve by itself?

MW: Well. That's a good question. I think all things, there's a chance it can resolve by itself. But one of the challenges with it, is that it's quite a mechanical thing. So the disc is actually out of place. So of course it can go back into place and it can start moving better. Of course people change the way they eat, they may know that apples or something like that is a classic one that irritates them. So they take a big bite on an apple press down and the jaw goes, so they might start avoiding apples.

And across a period of time, maybe the jaw will settle. But one of the dangers with it, is that with that reciprocal click, with the jaw flipping back and forth and back and forth over the disc, what it can do across time is to iron out the desk. So you end up with the disc actually flattening. The click starts to decrease or to go and then they think they're cured. But actually they've just ironed out the disc. `And the next thing is, is that then you were through the disc.

SB: Right.

MW: Potentially. I'm not saying in all cases, but essentially you're flattening it down, wearing it down. And if you do wear through the disc, then ultimately you're moving into an osteoarthritic situation and often you'll get osteophytes laying down. And if that is also painful, then the only real treatment for that is surgery. And that's really, of course not ideal particularly, because it's such a sensitized area.

SB: What do they do in surgery? I mean, is it arthroscopic debridement or actually the joint replacement?

MW: Yeah. They do both. So they'll do yeah, there's a number of different techniques, but they'll definitely do debridement, but I've also seen joint replacements as well. So yeah. But the challenge is, is that you're cutting right in this area, which is already sensitized from the previous TMJ issue in many cases. And it seems that it's particularly prone to driving central sensitivity.

SB: Okay.

MW: Yeah.

SB: I seem to remember reading somewhere that there's, in some cases a new disc will form, effectively. The ligaments will just harden up behind the existing disc.

MW: Yeah. So I haven't heard that. But you might well be right. Yeah. I haven't heard of that.

SB: I don't know what effect that has on function or pain in other areas of the body.

MW: Yeah. I don't know. I mean, it would be quite miraculous to get a disc that really functioned well that was attached into the the lateral pterygoid in the way you want it to be in this biconcave. So like I said, I haven't haven't heard of that, but I'm not this world's leading authority on TMJ. I just have worked with them. And so yeah, I don't know on that front.

SB: But the important thing about what we're doing here is that, actually you are very self-effacing. You're a much greater authority on TMJ than most of us and also a greater authority on how it can affect the other structures of the body and how they interact and what we can do about that in clinic. So talk us through that. What about the hamstrings?

MW: The hamstrings. Okay. Well it seems quite a long way away from the TMJ. But I think we should probably start closer into the TMJ, because then it helps to illustrate how these things can affect the hamstrings. So one of the things that we know about the TMJ, so it's fed by the trigeminal nerve as we discussed. The trigeminal nucleus has an anastomosis, so a connection to the accessory nerve. And so there's something called a trigeminal accessory or trigeminal cervical reflex.

And so what we know with irritation to the trigeminal nerve or to the TMJ of course, is that we get increased tone in the sternocleidomastoid and in the trapezius. And those two muscles, when they have increased tone, they pull the head into a forward head posture. So that in itself means that if you're standing on a plum line, when now your head is ahead of the plum line. So all that does, is it instantly loads the extensor chain theoretically.

If you just had forward head posture, but the reality for most people is they won't just have forward head posture. What they'll do is they'll compensate below. Most people will go into an increased kyphosis. So if the head goes forwards, then they tend to round more through the thoracic spine and then depending on their pelvic mechanics and on the musculature around the pelvis, they'll either go into a hyper lordosis, which of course then puts the hamstrings on stretch so that now they are essentially long and weak or you could say somewhat inhibited.

So that increases the potential risk of hamstring injury, who then go and sprint or kick a football or whatever it might be, bend over quickly. That's a classic injury mechanism for hamstrings and is a sudden flection. But then a another tied in mechanism is that, if you have a flat back, which is another potential response to forward head posture. So some people would tuck their tail under, they end up with a flat lumbar spine.

Well what's controlling that of course is the hamstring. So the hamstrings are working harder now. So they're working in a postural way to keep the pelvis tucked under and that postural loading, the hamstrings are quite fast twitch. So they should really primarily be used physically. So in other words, during gates, during sprinting and so on, jumping that kind of thing, lifting. But if we're using them posturally, then we're starting to decondition them for the sporting environment or we're asking them to essentially do two roles.

We're asking them to both tuck the tail under and to propel us forwards or to slow down our foot when we kick a football or whatever.

SB: I can't remember when we made the title of the broadcast we did with you sometime back, when we were down in the fish tank. And it was all about the difference between physique and postural muscles.

MW: Yes. Was that the core stability?

SB: Yeah. It might've been the mathematic. And the difference in the nature of the those two types of muscles.

MW: Yes. Yeah.

SB: Worth looking up if you get the chance.

MW: Yeah.

SB: These are all maths into it.

MW: Thank you. Yeah. So those are a couple of potential mechanisms, where if the head moves forwards then-

SB: Every time you say that, I feel myself pulling my head back.

MW: Yeah. Then it's going to change the weight bearing or load bearing relationships. So then another mechanism is that the TMJ is intimately related with the suboccipitals. So if you just pop your hands behind your up the head and palpate your suboccipitals and then just open and close your jaw.

SB: Make sure you're doing this at home.

MW: You can feel straight away activation of the suboccipitals, right? So there's this intimate relationship. And so if you've got tension in the jaw, you tend to get tension. So let's say you've got a left side of TMJ problem, you'll tend to get tension in the left suboccipitals you may get a slight left head tilt because also you'll get a left… increased tone in the left, sternocleidomastoid in the left trapezius as well. So this can throw out your optic otic and occlusal planes. So then what you're going to do is you're going to swing your pelvis

underneath you to get you back on the horizon as far as your vision is concerned. So you might be running down the road, but you're going to keep swinging your hip out to one side. And this is again a potential mechanism for injury for the hamstrings or for the ankle. So you be more prone to an ankle sprain on that side, potentially. Essentially just can be loading that left side more than you would the right, which again, across time and across distance.

If you think when you run a mile, for example, you take somewhere between 500 and 750 steps per leg, per mile. So if you're a runner and you go out for a five mile run, let's say it's five. So there's 2,500 steps and that's times your body weight. Okay. So so you're swinging your body weight across to that side, that bit harder for 2,500 steps. So across a few runs a few weeks. That's a huge amount of additional loading through that left side.

So these are things that could potentially drive lower limb injuries. But the other thing that's relevant with the suboccipitals, this sort of tension suboccipitals is that there is something called a tonic neck reflex, which means that when the suboccipitals have increased tone, you get increased tone in the hind limb extensors, which of course are the hamstrings. Okay. As in hip extensors.

SB: Run me through the mechanism of that again.

MW: It's what is called a tonic neck reflex. And it's to do with, it ties in with looking up and then the extensive chain switching on.

But of course if you're in neutral then you won't get any tone in the extensive chain from that reflex. But the moment you go like that into this forward head posture relatively, your head is looking up because if you had stayed neutral, if you've got this kind of forward head posture, if your head stayed neutral it would, you'd be looking down at the ground, you'd be walking along where you head down the ground. So you increase the tone in your suboccipitals to bring the eyes up to the horizon and then that increases tone, you know there. So then switches on this tonic neck reflex.

So there was a nice piece of research that I found from my master's thesis, which I did on hamstring strain and it was by McPartland's et al and it was a 1997 study. What they did was they took a group of subjects and assessed how they responded to hamstring stretching, a kind of contract, relax, hamstring stretch. And what they found was that on average they've got an eight degree improvement when they specifically stretch the hamstrings. Then with a second group, what they did was they just purely did a suboccipital release. They took it before and after and they got 13 degrees increased range of motion in the straight leg raise.

SB: Was that signal statistically significant?

MW: It was.

SB: It was a reasonable study, I guess. That's useful to know. Very useful to know.

MW: Yes. So it's one of those things that again, you wouldn't typically think of when someone comes in with a hamstring strain or hamstring tension, you're going to think to release the suboccipitals. But there is a rationale ends and research that backs that approach.

SB: I guess from what you were saying earlier on, I don't know if there's any evidence to say that TMJ can provoke suboccipital problems, or was it the suboccipital problems that provoked the TMJ problem? It could work either way, I guess theoretically.

MW: It could theoretically. Yes, yes. I mean it would be impossible to say which way around it goes. But from a survival perspective, one of the concepts that we talk about in the check training is this idea of a totem pole of survival reflexes.

SB: Yes, we saw it briefly earlier on it.

MW: Yes. Let's get that up. This is the image here. No, it doesn't. No. Okay. It's all right. It's near the front. There it is. So this is the totem pole that you see here and the idea is that there's a hierarchy of developmental survival reflexes and at the top you've got the image of for the psyche. And so that's kind of the chief controller of everything below. Then you've got the respiration just below that, TMJ just below that. Then vision, then audio, vestibular, then the upper complex of the neck. Then you move into the viscera, which have the emotions embedded within them, which is of course a kind of fairly, well I was gonna say is... What would I call it? I suppose. So different sort of more traditional medicines like iaveda or traditional Chinese medicine.

I've talked about the emotions being housed in the organs, but we also use that in our language as well. So we talk about-

SB: Gut feeling.

MW: Yes, a gut feeling or something being heartfelt or being heartbroken or having visceral fortitude, these kinds of phrases which are part of our language butterflies in your stomach. There's all kinds of different emotions that we relate to our organs. And so anyway, so the idea is that the emotions are in there and that they can sort of float up and down so that they are essentially a mobile factor on the totem pole. Then you've got the pelvis and then you've got the other joints. And so what Paul calls this, this is a check concept, is these are the slave joints so that they are the joints that essentially will respond and will even sacrifice themselves if there's issues above.

And so you can see TMJ is coming quite high up the list. And part of the reason for that is that we've got the otic, optic, and sorry, sorry. This is the occlusal optic and otic planes, which you mentioned here. And these are hardwired into all land animals. Okay. So, it doesn't matter whether you're lizard or a mammal or a monkey, whatever. You've got these optic, otic and occlusal plane reflexes, which keep the eyes and the visceral system in the bites on the horizon at all times. So the rationale here is that you can't go long without breathing and then you're in serious trouble. So you'll compromise everything below that. To make sure you can breathe effectively, you can't go too long without eating. And so again, if there's issues below or if it's causing issues below like neck pain, maybe you're adjusting the tension around the jaw so that you can get a cleaner bite, you're going to be less worried about your neck than you are about the jaw. So you will prioritize jaw function over neck function and so on and so forth. So that's why it's a sort of hierarchy there.

I would say if you're looking at it through that lens, then probably a TMJ issue is more likely to cause a neck issue than the other way round. And similarly from a neurological perspective, we talked about the trigeminal cervical reflex. There isn't the cervical trigeminal reflex, so it kind of seems to work top down as it were. Okay. Yes.

SB: Can I ask you a few questions?

MW: Go for it.

SB: I'm going to put this one's sort of down on my list so I've got to ask this one first because it come from Mrs. Trellis of North Wales. Are you a fan of radio 4? If you are, you might be aware of Mrs. Trellis of North Wales. If you've been watching our shows for some time, you will be aware of Mrs. Trellis of North Wales who is actually a chap and says he is what you might call a simple mechanical osteopath. And has found that in many patients with TMJ dysfunction he can palpate at the CTU lateral processes much closer to the angle of the mandible on one side than on the other and often attempt to correct this mechanically. I feel this allows the mandible to float to a better position, rather like a boat that has been tied up too tight to the dock side and rides better once the mooring lines are adjusted.

MW: Sounds good to me. Yes, of course there could be various rationale for that finding such as the suboccipitals being being tighter on one side, on that side. I'm just trying to think of my anatomy. So I think it's obliquus capitis, something or other goes from the occiput to C-2 and erectus capus, posterior minor doesn't. But I think erectus capus posterior major does. So you know there are definite connections from the occiput in that suboccipital group down to C-2, so it would make sense that you could find palpatory findings effecting C-2 when there's a TMJ dysfunction. And similarly, if you've got increased tone in the sternocleidomastoid and the trapezius as a results of

TMJ pain, then that's going to create a tilt. So the C-1 is going to glide across on C-2 to some degree. It may create more what we call it a sub cranial side bend. So you'd palpate that more readily. Yes.

SB: Someone called Steven says good evening Matt and Steven. On occasions when my stress levels increase, he says I'm suffer intense disabling pains in the TMJ region. From experience, the best way of resolving it for him is to lay down on the affected side, which increases the pain to a very high level for one or two minutes. Then gradually and fully resolves after 10 minutes. Can be either ear, doesn't know why it happens or why this works to resolve it. Any thoughts on that?

MW: Gosh, that's interesting, isn't it? Well, in the first of all I know that 20% of the adult population have bruxism and that's a figure that I picked up from one of the TMJ books was I studying. And so that can be a sign of TMJ dysfunction, but it's not always a sign of TMJ dysfunction. It can be associated with stress. So as he's saying, if he's stressed then he may increase tone in the jaw muscles. One of the things that seems to be very prevalent in TMJ patients is that there often is a strong emotional component. And so the limbic system seems to dump drive into the muscles of mastication. So that's why we hold tension in the jaw when we're feeling stressed.

It's because it's a very facilitated system. And what I mean by that is that we use it a lot. So the neural drives into the system are... I think we take 4,000 chews per day. We take between three and four thousand swallows per day and each time we do those things, then we are engaging that system and so we're sending neural drive into the system. So when we've got limbic, emotional overdrive, let's say, or kind of over sensitization because of the stress of the day or the life event that's occurring, then we try and dump that into the muscular system to avoid overloading the limbic system. And that's the levator scapulae is another muscle that takes a lot of limbic emotional drive as well.

So I'm not sure that that was an answer, but it's sort of correlates a little with what he's saying.

SB: Robin sends in that he's heard of the disc developing a corrugated wear pattern. Do you know if there's any truth in that?

MW: Oh, I've not heard of that. I've not heard of that. Yes. So I don't know. I mean certainly I've heard that it can fold on itself and certainly can get adhesions in the disc I guess. Well because it's biconcave you could get either side folding in so it could have a sort of corrugated appearance. So it seems like there's a feasibility there but I've not heard of that specifically. Yes.

SB: One person's asked about the study you mentioned right at the beginning earlier on about roots you did your master's.

MW: Oh yes.

SB: Did you look at things the other way? Treating the hamstrings, giving suboccipital release.

MW: That wasn't actually my masters, it was a research paper that I found for my masters. So I didn't do that. And I'm not sure that they did. That certainly wasn't in that paper, but they might've followed up down the line.

I think it's less likely partly for the reasons that we've been talking about that you don't have, you have a tonic neck reflex, which affects the hamstrings, but there isn't, as far as I'm aware, a hamstring reflex, which affects the suboccipitals. And if you think of it from the perspective that this is your control center. So this is kind of what the totem pole idea is based around this. This is the control center. It needs to stay on the horizon, it needs to be able to focus, is to be able to balance, et cetera. And it needs to be able to bite accurately. And so you've got various mechanisms that allow this to stay functioning optimally and you'll compromise things below.

SB: Do you think that analysis though would stand up to the scrutiny of those who criticize our professions and say, that's all very well, it's a lovely model, but it seems a little bit hocus pocus. You know it looks as where's the evidence that the body works in this way?

MW: Well there's a lot of research that backs it up. I've got a book from 1985 called static kinetic reflexes in something or other equilibrium and health or something. And this was a lot of research from Japan where they studied this in depth, my point in telling you about the book is it's not new information. It's been around for quite a long time. And, and it's not unique to humans either, it's across the animal kingdom. You see this head righting reflex in the optic, otic and occlusal planes. Because you imagine a lion going in for the kill and missing the jugular or even a giraffe going in for the leaf and keeps missing it. You know it's not gonna work. You're not going to survive, so you need to have these things in order to have more control.

SB: I don't want to sound that I'm criticizing the idea. Because there's plenty in conventional medicine that doesn't stand up to scientific analysis, but it seems to be the case, doesn't it?

MW: Yes, absolutely.

SB: It hasn't got the scientific background to it. Mrs. Trellis is on again. Mrs. Trellis actually goes also by the name of Matthew Davis. He says, "Apologizing for having another question." He's just been fitted with a bite guard for the first time since his rugby days and he's wearing it now in case I'm anything about the GOsC comes up.

Can I expect it to have an effect on his hamstrings or anything else?

MW: Yes. It could do.

SB: I presume this is a nocturnal bite guard for presume to be bruxism or whatever.

MW: Yes, absolutely. You know what it does it decompresses the jaw joint and it sounds sounds a little bit counterintuitive, but one of the reasons that people with TMJ get bruxism is that they are actually trying to decompress their jaw joint, so it does. You'd think that biting down would compress it, but actually what often happens, I'll show you a slide that I've got here. If I can make the right one come up. Let's see. Okay, so give this a go.

SB: It's gonna come to the first one again, isn't it?

MW: Possibly. We'll flick through together. So what this is showing when we get there, it's showing that it's hung. There it is. This is a tongue with scalloping. And so what you see here is you see this kind of indentation around the tongue and this is really easy to pick up in your patients. In fact, it's best to see with the tongue in as opposed to the tongue out. So her scalloping is obviously quite severe because you'd normally, when people stick their tongue out, it's straightens the tongue out. When it's back in the mouth, you see the scalloping and what it is is this person's been using their tongue as a splint. They've been putting it between their teeth and biting down on it.

Okay. You see the same with the cheeks as well. So he's scalloping in the cheeks and you might just sit on one side or you might see it both sides. But this is something to look out for with patients who you suspect have got a TMJ problem or you know have a TMJ problem. The more severe the scalloping, likely the more severe the problem is. So what essentially you're doing, if you've got the lower jaw and the upper jaw, you're putting the tongue between it and then biting down. And what it actually does is it decompresses it kind of pulls the head away from disc. So it moves it slightly down and forwards and brings it slightly away from the disc and it creates relief.

SB: This looks as a rule to be quite painful in his own right.

MW: Well the interesting thing is, is it's not painful particularly. I mean it can be. I've experienced it myself and I hadn't realized, it was only when I was on a course and the guy took a look inside my cheeks and said, "You've got a bit of scalloping there, man." And I thought, well that's weird. I don't get any clicking in my jaw and I'm gonna have any pain. And what I noticed the next time I was in the gym, probably wasn't the next time, but down the line, I was in the gym picking up a heavy bar, so a deadlift and I happened to be in front of a mirror. So I've gone to pick this bar up and I've looked in the mirror and when I saw it was I was sucking my cheeks in between my teeth and I'd never

realized that I did that before, but I was obviously doing it to decompress the jaw.

And I think this is quite a good time to show you a technique that you can use to assess people with.

SB: For which I think I'm going to be the model.

MW: Well, yes, yes. I mean it's a very simple technique and in fact, in a way it's just useful as a demonstration to people that are learning about TMJ dysfunction. But if the jaw is in an optimal position, then what that means is that you've got optimal balance between the musculature on the front, including above and below, and then the musculature on the back. But if there's any kind of shear in the jaw or if there's any kind of inflammation of the jaw, if the disc is slightly out of place, then what that means is that you won't want to compress up through here. So what that means that you will decrease the drives to the musculature down the back. So essentially the trapezius.

So you can do a simple kind of AK star tests, like applied kinesiology. Okay. So just the muscle test, arm out to the side. So essentially if I press down there, then I'm loading your deltoids and your trapezius is stabilizing the shoulder girdle. Okay. So those are the two muscles that are being loaded there. Now if you do that with your tongue in the roof of your mouth, which is should be theoretically should be where it is and it's physiological rest position and with your jaw in neutral so you're not moving it around at all, then you should have a certain level of strength. So we can just test your strength there and it's pretty, pretty good. Right?

SB: Very good I'd say.

MW: Extremely good. In fact, probably the strongest man I've ever done a test on.

SB: They're laughing in the gallery up there.

MW: I heard it. This is as much for me as it is for you, then deliberately malocclusion or take your jaw out just to one side, arm up, and then we test again and just see how you feel there. Do you feel any different?

SB: It felt weaker the second time you pressed on it.

MW: Yes. And so you know, that's deliberately putting a shear through the joint.

SB: If you do it the other side.

MW: Yes, yes. Either way you're putting a shear through the joint and then tripping it back to normal and just swallow a neutral head. And then there. Now obviously these tests have a degree of subjectivity about them, but for most people they can get a sense straight away that, "Oh yeah, no, I don't feel as

strong when my jaw is out of position." That's where these bite splints come in. Because what they do is they decompress the jaw. So this is why a lot of them advertise you are x amount stronger when you use them during a game of rugby or in the gym or whatever. And there's truth to that.

One of the research studies that I saw showed that your 13% stronger, so one-three when you have a bite splint in versus when you don't. Assuming you've got malocclusion in the first instance. So it's not that everyone will get that benefit, but if you've got some form of malocclusion or shear going on in the TMJ, put a bite splint in your strength will increase for that reason. But I've seen quite extraordinary figures claimed by some of these bite guy, like up to 80% stronger. And I think that may be a bit more marketing than it is scientific reality, but I guess they have to have something to back their claims. That's an example of of how TMJ dysfunction can affect sports performance or just general performance.

SB: Going back to that question about pain, about lying on one side and getting pain. I can remember when we've had some Simeon Neil Asher in on courses and in here, he's made a comment that of course if your applying pressure to a trigger point, they will be exquisitely painful. Then the pain will go away and the trigger point will relax and the remote areas that are affected by that trigger point will also then decrease in sensitivity. I wonder if that might be part of the mechanism that is going on there?

MW: Could well be. Yes, it could well be. Certainly-

SB: Depends on, we didn't actually hear where the pain was, whether it was actually in the TMJ or around the temporalis or...

MW: Yes. I mean certainly you're compressing some of the muscles there. I don't know. I mean it does sound obviously an unusual response to laying on your side but...

SB: I've got a comment here marked with a yellow flag to show that it's a bit more sort of urgent. Because it starts off we eek exclamation mark. I've had that scalloping since wearing my mouth guard and no, Stephen, the scalloping isn't painful. So an interesting observation. And we've got lots of questions coming in along the lines of do you think mouth guards help or do they further damage the TMJ?

MW: I think they're fine. They're obviously just not the solution. They're like a brace.

SB: Symptomatic relief.

MW: Yes. So they have a place and certainly they can be beneficial for a period of time, but it's not dealing with the cause of the issue. So I would use them, but I wouldn't say that it's solving it.

SB: I imagine that a lot of what you've said so far is going to resonate really well with osteopaths and chiropractors, isn't it? Because it's not that we're always looking for something at the opposite end of the body. That's the reason for the ankle and the toe pain. But when you can come up with a fairly precise scientific pathway whereby this might happen, it does make us think, well, yes, actually there is genuine evidence behind what we're doing in a whole body approach. Which very few other people are doing. I mean I can't imagine any dentist would start saying, "Well, you've got this going on here. Have you got a problem with the hamstrings?"

MW: Yes, yes, yes. Well some of these TMJ specialists are amazing kind of observers of human function. When I've been on courses with them, they analyze people whole body like, you can see it's got an anterior pelvic tilt there. They'll be over pronating here, and they'll tie it back into the TMJ. And so again, we know that there are potential flaws with that way of working and that it's not an exact science, but it's still impressive that they're looking at the whole body. So yes.

One of the things where we're talking whole body that I think is really useful for us as manual therapists to understand is that there's this kind of growing body of research around central sensitivity at the moment and central sensitivity. I think most of us would have been trained in central sensitization is normally what it used to be called.

But there's, I'm just trying to think if I can remember the guy's name. Yes, a guy called Eunice who has done a couple of papers now talking about a better term for its central sensitivity because... And he goes into all the rationale for why that is, but he talks about multiple different syndromes that all contribute to central sensitivity. And it could be that you've got one of them on their own, or it could be that you've got multiple contributing factors or it could just be that you have pain. It could be spinal pain or any kind of pain in the body from an old injury. You'll need one of these things to be present and that can create sensitization in the nervous system, which then means that you are more prone to aches and pains elsewhere in the body.

And one of those known drivers of central sensitivity is TMJ dysfunction. So I think that's really quite interesting because what it points to is, and in fact, one of the parts of the story I was going to tell you about how I got into to TMJ dysfunction is that Paul Chek, who of course I started his training in 2001, in the 90s he had really specialized in working with difficult to solve cases. That was what he had tried to do to form a niche for himself in the market. He likes a challenge. So he went around to all the doctors in San Diego and the surgeons and said, "Look, anyone who you can't seem to get better, send them to me. I'll give it my best shot." So of course these are kind of problem patients for a lot of these doctors and surgeons. So they go, "Okay, give this guy a try." And what he found almost consistently was they

had TMJ dysfunction and maybe as a cause, maybe as a result. But he found a very hypersensitive TMJ dysfunction. And so he really studied up on that and he wrote a chapter in a medical textbook called cranium facial pain. So that was how he got into really studying the TMJ in a lot of depth.

But my point is that now we're finding out 20 years later, 25 years later, that the TMJ is linked in to this central sensitivity. So these difficult to fix patients probably had multiple things going on including TMJ, which was sensitizing their nervous system. They just weren't responding to the normal medications or the normal manual therapy or the normal exercise. They needed more than that and they needed to work not just on those things but also on nutrition also on sleep also on their TMJ, whatever else was driving their challenge.

SB: There's probably a whole discussion on central sensitization or sensitivity that we could have and indeed we have had on occasions in the past. The research on is going is continuing isn't it?

MW: It is. It is, yes.

SB: And how we apply that research is also developing. A side comment here from an anonymous comment or commenter. An acquaintance recently under treatment for chronic TMJ committed suicide. Stopped eating, pain all over, especially into the eyes. She was treated by dentists using night mouth guards, which just got more painful.

MW: That's really sad.

SB: And why I'm inferring from that, the suicide was the consequence of the TMJ pain.

MW: Yes, yes.

SB: There's definitely a component and it's shows how serious the problem can be.

MW: Absolutely and I actually didn't finish the comment I made earlier when we started talking about suicide originally, and that was that this patient that I'd referred to the TMJ specialist, she decided that she probably couldn't afford this. I think it was five, six, seven thousand pounds bill, and of course they do it so you pay monthly across a period of time and try and make it as affordable as possible. But it's still a big old investment. And so she shopped around a bit and she found someone who could do the whole process, they said for 600 pounds. So she went along and got this treatment. But the reason this lady could do for that price was because she was doing dynamic MRI Scans. And so my patient saw this lady and all started out well. She seemed really thorough and really nice and I'm sure her intentions were very

good. But she went in the wrong direction with the brace work and she pinched the disc into the joint.

SB: She was an ortho, a dentist?

MW: Yes, a dentist. And, and so she essentially, she had kind of done the brace work in the wrong direction. And my patient became suicidal for a period of time and she managed to get through it. But when I spoke to my colleague, he said, that's why we would never do that. We would always do it with a dynamic MRI scan because otherwise you're guessing and you can have a good guess of it and you'd probably get 80% of them right.

SB: Which presumably is how the other practitioner was working. Eighty percent will always be in this direction, therefore will always correctly other way.

MW: Yes. Yes. But of course the other thing is that it's a very expensive intervention and a lot of people can't afford that with the best one in the world. So if you've got TMJ dysfunction, then it can be really problematic. And there's not many specialists around that really work with the TMJ at a high level.

SB: No. And it's interesting isn't it that presumably the NHS doesn't offer anything of that term of that kind.

MW: No. One of the things that was a bit of a flippant comment, but it's kind of sticks with you, is that the idea that dentists or orthodontists especially are all about the tooth, the whole tooth and nothing but the tooth. So it's this idea that if you align the teeth, that's the key thing. They look good, they look aligned, they look straights, not overcrowded. Fantastic. But what's the ramifications of that for the TMJ? And that's just not considered. And so you can straighten the teeth out by pulling out a couple of premolars and then creating the situation where you're essentially retracting the mandible and creating pressure.

SB: Do we know any statistics on how often that does cause a problem?

MW: No. I don't think we have direct statistics. This is again just a comment by the TMJ specialist. I know, but he felt that about 98% of TMJ dysfunction was caused by dentists. Now that's not going to go down well with anyone who knows any dentists or who is a dentist. So I point to him for that. It might've just been like they say something like 95% of statistics are made up on the spot. I think there's that old joke. The point is that probably is just in his experience and a lot of people seem to have issues because they've had premolars removed in his opinion.

SB: But one of the questions that's come in is, do you have any idea of how often surgery is successful in resolving problems?

MW: No, I don't actually. I don't have specific figures on that. I mean, I know it can be. It's not the case that you're in real trouble if you have to have the surgery. But the challenge as I mentioned is that everything is so sensitized already that to then go in and cut and remove and hammer and drill and all the other things that they need to do. This sort of advanced branch of carpentry, it's to be avoided as best you can, but then it is an option if you've got no other options.

SB: Someone's asked here if TMJ can contribute to or cause problems lower down the body, where do you start in treatment? Do you start down there or do you start with TMJ?

MW: Well, that's where that totem pole model comes in quite handy, because you can screen those things quite quickly. You can obviously screen each of them in depth, but you can do a quick test on the eyes to see how they're tracking and so on, you can do a quick assessment on their breathing. I normally tell them I'm testing their pulse and so I just hold their pulse whilst I'm watching their breathing and that puts them at ease that they don't think you're assessing their breathing.

But also, you can take their pulse rates. So I normally say, "I'm just going to take your pulse for a minute," assess the pulse for 30 seconds and then I watch their breathing for 30 seconds and I double them up and then you get the ratio of breathing to pulse, which is quite helpful, because they should be divisible by each other. So again, it's a low tech test, but it's a kind of basic form of heart rate variability. If you get 10 breaths per minute and 60 beats per minute, then 60 is divisible by 10, so everything's in harmony. But if you get 63 and 10, it's not divisible to a whole number, so the systems are slightly out of sync, and in all the studies on heart rate variability, what we know is that that is a system that's under stress.

So when you're feeling stressed, it's because the synchrony between your heart rate, your breathing rates and quite often your brain wave state and your peristaltic state, they're called the biological oscillators, when they're out of rhythm, then you feel stressed. You feel that kind of sense like just before you're coming down with a cold, you just don't feel right. You kind of don't know what to do with yourself, you feel a bit awkward and uncomfortable and that's you're out of sync. Now, if you can learn how to break that, which you can do with, for example, going into a tai chi state or meditation or mindfulness, and there's various bio feedback towards you can get to help with that, then it resynchronizes these biological oscillators and sometimes it can be enough to stave off a cold or coming down with something.

So I don't know how I got onto that, but yeah, but I was saying, so you can assess the things on the totem pole quite quickly clinically. So quick assessment for TMJ is first of all asking, "Do you get any clicking or popping

from TMJ?" Now, if people say, "Oh yeah, every few months I might bite into an apple and I get pop," that's not really what we're looking for. It's more like, every time they open their mouth, it clicks or pops, or at least it's regular. So if there's popping or clicking, that's a sign that the disc is not in place, or is popping out of place at least.

So then the next thing is, what's the range of motion of jaw opening, because a real simple test is three fingers in the mouth. This is sort of anthropometrically, that's probably good because it's your own free fingers, so you should be able to get them in just about. Now from the TMJ specialists, they have research which shows that if you can open your jaw less than 50 millimeters, then you've got a statistically significant chance that you've got a displacement of the disk and that that's blocking the full range of opening. So that's a very simple test you can do, just ask someone, "Can you open your mouth?" You measure it with a ruler or there's various sort of specific measurement gadgets you can get, but yeah, a ruler will do. If they get less than 50, then you're thinking, okay, there's a statistically significant chance that there's a displacement of the disc here. The worst I've seen is 17 millimeters, so that's someone who can't eat. They can only eat soup and this kind of thing and that's a real problem then.

SB: There must be a certain amount of anatomical variability in this presumably though.

MW: You'd have thought so, but the statistics iron everything out. So statistically speaking, less than 50 is sort of where you need to ... I wouldn't say it's a definite diagnosis in my view, it's like your ears are perked up, it's kind of like, okay, this is a yellow flag almost or an orange flag. So then it might warrant you looking a little deeper going and palpating the muscles of mastication. If they're getting more than 50 and they don't get clicking, then you can say, "Okay, screen that and move on."

But yeah, my experience has been over the years that as you understand more and more of the different things that can affect, let's say, the hamstrings, the danger is that you don't look at the hamstrings at all, and that is also dangerous because the patient then feels like, "Well, I came with a hamstring issue, all you've done is you've looked at my back, and you've looked at my jaw, and you've looked in my eyes, you haven't looked at my hamstring."

So I think it's important to address that issue that they are complaining, even if it's just for the sake of ... so just a little bit of massage just to say, "Okay, we're just going to massage his hamstring," but really you're interested in the SIJs or you're interested in the TMJ or whatever. But yeah, that is important I think psychologically for the patient, even if you're explaining these mechanisms.

SB: How much depth would you go into in explaining all this stuff that you've been going through here?

MW: It does depend, yeah.

SB: Because it's quite a leap of faith for many patients to say, "You're saying that my jaw's affecting my hamstrings or ankle or whatever it might be?"

MW: Yeah, yeah, yeah. Well, the thing is they're living it, so quite frequently you can say, "When there's tension on this side of the jaw, you get more tension on this side of the neck," and they're like, "Yeah, no, I always get more ... I get headaches on this side," or you can show them the measurements. So you can measure their head to show there's a three degree tilt in the head. So we use a little inclinometer to assess that and so then we've got an actual measure. So we say, "Look, when we put that thing on your head, you can see there's a three degree tilt or two degree tilt, whatever it is, and that would probably be because the muscles and that side are tight and holding it down. So that's very common sort of scenario when you've got tension in the jaw." So we just explain it through.

But I guess one of the slight caveats for me is I tend not to work on a sort of half-hour treatment model. I mean, I certainly do at times, but I tend to use longer duration assessments and treatments, so I have a slightly different model to the norm and that does allow me a bit more time to explain things.

SB: Yeah. Another question, and I'm conscious that we're running out of time ourselves, there's 20 minutes ago, Robbins asked, would suboccipital injury precipitate these issues? Could that be involved in nocturnal teeth grinding and what are your suggestions for managing nocturnal teeth grinding?

MW: Okay. Certainly could precipitate it. Like we said earlier, I would say it's most likely that you get a TMJ issue driving a neck issue, but you can certainly get a neck issue driving a TMJ issue as well, just because of the very close mechanical relationship. But neurologically speaking, it's more likely to be the other way round. So now in terms of nocturnal grinding, that's a really interesting question because one of the things that drives nocturnal grinding is stomach irritation. This is something that if you speak to anyone who's a specialist in dysbiosis or the microbiome or parasitology, they'll tell you that yes, some parasites are far more active at night. What that means is that they create more inflammation in the gut at night, and so because you're getting increased inflammatory response in the gut, you get more afferent drives via the vagal afferents.

Again, the vagus nerve is one of the nerves that anastomosis with the trigeminal nerve, so you get dumping of neurological drives into the muscles of mastication, and like I said, classic symptom of parasite infection or fungal overgrowth is tooth grinding. So if it's happening at night and not at other

times, then it's not to say that it's definitely a fungal parasite issue. But again, back to this whole thing of central sensitivity, people with central sensitivity, which TMJ can drive or be driven by, they normally are not well, they're normally exhausted, their energy is low. They might have fibromyalgia, they might have irritable bowel syndrome, they might have dysmenorrhea. There's multiple things they know are contributing to and caused by central sensitivity. So irritable bowel syndrome could be secondary to candida overgrowth, for example. But also, all of these stresses on the system, they impact on the immune function. So then you're more prone to things like yeast overgrowth or amoeba infections or protozoa overgrowing in the gut, and then you get this grinding as a result of that.

So of course it's not easy to distinguish between the two, but there are ways and means to screen obviously for gut issues and then to screen for TMJ issues, and so-

SB: Well, that actually leads us nicely into a question from Stewart who says, "Could you run quickly through what your screening processes is for TMJ??

MW: Yeah, sure. So of course a bit of subjects of history. So you want to know if there's been any trauma. You also want to know what dentistry they've had, because if they've had teeth pulled, then that increases the risk. You want to have a quick look at their facial profile. So we've got an image actually, should we give it a go?

SB: Yeah, we'll get it eventually, yeah.

MW: Okay. Yeah, okay. Well, let's give it a go. So yeah, okay.

SB: So we're back at number one again.

MW: Back at number one, we'll jump through. I've driven one too many. Okay, so here's the profile. So this would be ... Have I gone too far?

SB: This is the normal TMJ profile, isn't it?

MW: Yes. Yeah. So this is normal TMJ. So this is someone who has optimal alignment of their lower and upper teeth, and so the jaw's in a kind of neutral position, and so you see that on this side, the jaw nicely housed up against the temporal bone there.

SB: I just-

MW: I'll go.

SB: No, no. Well, I was just going to say, that black box up there, those are presumably the causes of problems, malocclusion and then you've got forward head posture and presumably that's upper crossed syndrome.

MW: That's upper crossed syndrome, yeah, yeah, yeah. Actually, one thing I haven't really talked about so far is nutrition, and on that front, many people have heard of Weston A. Price's research done back at the beginning of the 1900s. But what he found was that when he was traveling ... So he was a dentist who traveled all around the world seeking out indigenous groups that were untouched by industrialized commerce and food, and what he found was that in general, the dentition was perfect or near perfect. They had very good dental arch developments, they had all their wisdom teeth, no problems with impaction, et cetera, et cetera. He was from a family, I forget how they had made their money, but he didn't need to work. He was a dentist, but he didn't need to, he just had enough money he could never work again.

So he took it on himself to keep going off on tour essentially to different parts of Africa and South America and Papa New Guinea and so on and he was really interested in what people were eating, and of course being a dentist, interested in their arch development of their face and their dental development. But what he found was that as essentially industrialized food started getting into different population, then you started to see dental caries appearing, you started to see teeth falling out, you started to see malformation particularly of the mid third of the face, so this is the maxillary arch. This just so happened to correlate with work from Francis Marion Pottenger, who you may have heard of Pottenger's cats.

Now this work has now subsequently been debunked, but it was an interesting study because what he found was that when he fed cats cooked foods versus raw foods, so cooked meats, cooked milk, that he found that the middle third of their face decreased in size and their dentition went all kind of haywire and they got dental caries. But when he fed them raw foods, then everything grew as it should do and the dentition was great, et cetera. It turns out that when you cook foods, yeah, you damage Taurine in the food and cats need Taurine, it's an essential amino acid.

SB: So his research was debunked because he was inferring that the same process would happen in humans or?

MW: Well, so they just made the observations at parallel times more or less, and so it was like, "Oh wow, look, this was what happened with cats, what's happens with humans? We need to eat more raw foods," which is probably true on the one hand, but the reasons that they were saying, because cats do better on raw food, doesn't quite work, because actually the issue was with Taurine.

SB: Different mechanism. Yeah.

MW: But the interesting thing is that in both instances, you're getting a degree of malnutrition, and what happens when you get malnutrition it seems across

generations is that you get this decrease in the middle third of the face. I remember talking to a voice coach about this who was a TMJ specialist herself, not a dentist, but she actually set up a whole system called voice gym. The reason she got into it ... Her name's Angela Caine, she died a few years ago unfortunately, but she got into because she had a TMJ dysfunction which ruined her singing and acting career.

SB: Is someone carrying on her work.?

MW: Yes. Yeah, there is someone carrying on her work, and she's got books online and she's got a website still called Voice Gym. I think it's voicegym.co.uk. So that's worth looking at because it's really fascinating work. She's the person that talks about the joker face and getting that anterior temporalis to engage. She's got amazing footage, I think it's still on her site, of this young singer who you can hear she's a good singer, there's something about her voice, you think that's a trained voice, but she's singing right out of tune, and you're looking at it going, "This is weird." Because when you got a trained singer, you normally expect them to be singing in tune.

Then Angela says to her, "Right now, I want you to clean your teeth." So she hands her this toothbrush and says, "Clean your teeth," and says, "Now sing." I forget what the song was, but it was some kind of ballad so that you can really blast out and suddenly she was perfectly in tune. Couldn't really hear what she was saying obviously, but she was perfectly in tune. What it was is that by going to clean your teeth, you bring the jaw down so you decompress the TMJ. So that helped her to hear better because she had this retracted jaw that was compressing her external auditory meatus, she can hear herself effectively. But also, you do this with your eyes typically, you lift through the eyes. So you get the anterior temporalis involved and you switch the lateral pterygoid to move the jaw forward so you can brush.

SB: Right. So we need to get back to how you do your clinical assessment for TMJ as well.

MW: Oh, do we? We finished that.

SB: That was the question was and we got as far as this picture.

MW: Yeah. Okay. So you can look at the profile, so this is a class II malocclusion. So this is what typically happens when you get the overcrowding, you get the teeth extracted, the jaw retracts backwards and so then it compresses the retro discord tissue. So that's the most common malocclusion you'll see.

SB: There's a division of that as well, isn't there?

MW: Yes. Yes. So this is the division two, and this is where the teeth are tipped back. This is very common in kids that have not been breastfed, because they develop a dysfunctional tongue thrust pan. So when you're breastfed, and

this is a key component of preventing TMJ dysfunction, and of course it's very controversial as well because a lot of women aren't told this and all women I've seen struggle with breastfeeding, it's not an easy thing to do.

SB: But there's some good evidence there to at least associate lack of breastfeeding with TMJ problems?

MW: There is, yeah, for a number of different reasons. So one of the things that we know about breastfeeding is that it takes 60 times more force to get milk out of a breast than it does on average to get it out of a bottle. So your tongue has to work much harder to pin the breasts. So you've got the breast tissue coming into the mouth, you've got to pin the breast against the top of the mouth and then roll the tongue back to milk the breast. So you've got this going on like this, and that's hard work on the tongue. But what it does, it teaches a functional tongue thrust. So then the tongue sits up, like we did with the assessment earlier with you, in its physiological rest position. It should be like a Cobra ready to strike is the way they describe it, so it's right up in the roof of the mouth.

What it means is that you can't nose breathe ... Sorry, you can't mouth breathe, you can only nose breathe when the tongue is up in that position. So that's kind of everything's functioning optimally. But then each time you eat, each time you swallow water, and you swallow 3,000 to 4,000 times per day, that tongue pushes up against the roof of the mouth and it expands this dental arch. So that then allows space for your premolars to come through and for your wisdom teeth to come through and so on, and so it provides neck stability, it provides TMJ health if you like. But it helps that mid-face to grow because you're putting pressure out against the mid-face with every swallow, but also just in its rest position, it sits there.

So when you bottle-feed, what you end up with is you get a dysfunctional tongue thrust, and so in fact you don't really ... because you tend to thrust against the teeth or against the tit of the bottle because that's how the milk comes out. So you don't need any pressure and often it will push the teeth out or you can end up with, because of the lack of pressure, the teeth coming in. So that's that second class. So we basically just want to look for these profiles, and this is, again, the class II again, which is kind of, you could call it a goofy look, and that's about 66%. So by far we have more class IIs but class IIIs are more down the chins out underneath. So the mandible has moved down under maxilla. This is normally much more problematic.

Also, one of the things that the posturology group from France have found, because they do a lot of assessment of weight shift as part of their methodology, is that this class II malocclusion tends to correlate with translation of weight forwards onto the toes. This class III malocclusion tends to correlate with translation of weight back towards the heel. So people tend

to lean back on their heels with the class III, they tend to lean forwards onto their toes with the class II.

SB: Your statistic here, 66% of TMJ sufferers have this appearance or 66% of people like this have TMJ.

MW: No, no, that's 60% of a malocclusion is class II.

SB: Right. This one here, how often are we seeing that?

MW: That'll be the remainder. That'll be-

SB: Oh, there were other dysfunctions that you mentioned earlier on.

MW: Well, this is class II as a general category because we split it into two categories.

SB: Oh okay, I see. Sorry,

MW: Yeah, yeah.

SB: Okay.

MW: Yeah.

SB: So we've got-

MW: Yeah, so you've got that. So you'd look at profile, you'd measure the range of motion like we talked about, you'd observe for opening and closing and a good sort of companion to that is to put your fingers into the ear, so I'll glove up, put my little ... Some people call it the little pinky test, you just put your fingers into the ear, and actually if you do that now and open and close your jaw, you can feel your TMJ right there. You shouldn't be getting compression. If you're getting compression, then that's a sign that your jaw has retracted. Okay. So you feel for compression, you feel for crepitus as well, and you can actually also oscillate the joint, that's quite a good thing to do. So you open and close a few times whilst oscillating and you can hear for crepitus there. But you're looking for essentially symmetrical tracking, and what you'll often see with the jaw is that it'll go out to one side and then flip round so you get a kind of C-shaped curve.

So normally what that is, is that as the jaw goes to open, what happens is, the disc, because its anterior blocks, let's say, this left side, so it moves forwards and so the right side continues moving, so it's kind of C-shaped motion and then this flips and goes over the disc and it kicks back into the central position.

SB: Yeah. So the direction it deviates indicates the likely side of disfunction?

MW: Exactly. Normally it goes towards the side that the disc is displaced.

SB: Yeah.

MW: Yeah. Yeah.

SB: Do you use the AK test for most of your patients?

MW: No, I wouldn't say I use it a lot with my patients, but I will use it to demonstrate the importance of TMJ placement, particularly when I'm teaching TMJ dysfunction. But there are other tests as well that you can do. You can do one for neck strength, which also sort of correlates in with tongue position again.

SB: Okay.

MW: Do you want me to-

SB: Can you try to demonstrate that? We've got a few minutes.

MW: Okay. Okay.

SB: Yeah, let's do a demonstration on that one.

MW: So for that one, basically what I would do, you put one hand against the forehead and one hand against the back just to stabilize. What I'd like you to do first of all is have your jaw open and the tongue on the floor of the mouth. So this is just giving you a sense for both as a therapist, you get a sense for their ability to resist. Okay. You look to see how they handle that, and you handled that pretty well. So it doesn't look like there's too much shear there. But if someone's got a neck instability, they won't like that. They will not push at all because it's creating shear in the joint. So they'll just kind of move away from your pressure.

So then if you swallow and get the tongue up to that striking position that, that Cobra ready to strike, and then just hold that there and then you push it again, it's much stronger actually. I don't know if you feel the difference, but I couldn't move you back at all there. So essentially what that's doing is it's engaging-

SB: So is that normal, the former is weaker of the two?

MW: Yes. Yeah, that's normal. That's normal.

SB: Yeah.

MW: So someone who's been breastfed and/or who has a functional swallowing pattern, that's what I'd expect to find. Someone who has a dysfunctional

swallowing pattern for whatever reason, well then, you'd expect them to be weak in both scenarios. When I say both scenarios, you're training them to put the tongue on the roof of the mouth, but their default scenario is that their tongue will be on the floor of the mouth.

So this leads into another driver of TMJ dysfunction, which is breathing issues, and in particular allergies and things that make people mucusy in the nose. Because if you can't breathe, if you're a mouth breather, because you can't breathe through your nose, then it disrupts all the length, tension relationships between the muscles at the front of the neck and the back.

SB: One of our questions is whether chronic sinusitis can have anything to do with TMJ, which I think you just answered.

MW: Certainly yeah, yeah.

SB: Oh dear, we've got five minutes to go and I've got a red flag here that says we've got lots of questions. Can we send the answers to you and get some later perhaps as a follow as we did in our previous broadcast?

MW: Yeah.

SB: I don't know who this is. Someone says, "Gee, how flipping clever is Matt." Yeah, it's annoying, isn't it? Yeah. It always some-

MW: You're just interested.

SB: There's always someone who does this to me and they do it deliberately. Is the stomatognathic system still used as a collective of musculoskeletal associations?

MW: Yes.

SB: I have no idea what that means.

MW: Yes, it is. So this is the incorporation of the shoulder, neck and jaw.

SB: Right. So the answer is yes.

MW: Yeah, yeah, it is. Like we were just saying, you can't really fully address the shoulder without addressing the jaw, because it's so integrated. You can't really fully address the neck without addressing the jaw. So I would say yes.

SB: Now, I'm going to have to be as quick as I can for some of these questions. Is it possible that a brace can affect the nerves in the jaw causing dizziness?

MW: Yes.

SB: Good. That's a nice simple answer. We've got one, what do you find are the most effective treatments for TMJ? That might be quite a lengthy answer I imagine.

MW: Yeah, it's tricky to say. But I would say it's a combination of manual therapy is probably more palliative in most cases, is going to support what a dentist, TMJ specialist would do, but in some cases it can be restorative or corrective. It depends what's driving it. So if you're doing your manual therapy, you're working on their posture, you're working on their nutrition, working to decrease sensitization if that's present, then you can have a tremendous effect without a TMJ specialist present or involved.

SB: There are some acupuncture points which are used for TMJ problems out there.

MW: Interestingly enough they're right through that posterior temporalis region that they tend to ... There's a whole bunch of acupuncture points and acupressure points right around here.

SB: I think there are some on the pterygoid themselves, aren't there?

MW: Yeah, there are.

SB: To reduce the tension presumably.

MW: Definitely. Definitely. So you can certainly reduce people's pain dramatically and things like mid-face pooling. So one of the symptoms of TMJ dysfunction is that people get big bags under their eyes, and that's because the maxillary veins drain through the masseter. So if you're holding your jaw tight, if you've got any kind of bruxism, then of course that means that it locks down on that maxillary drainage, and then you wake up with big bags under your eyes. So that's why stress does the same, because you've been clenching your teeth. That's also why gut issues can do the same as well, so a lot of people with parasite or fungal overgrowth, they'll have big bags under their eyes for the same reason.

SB: Okay. I'm just going to read a comment here from Steven who sent in his comments earlier about relieving the pain in the…

MW: Yes, yes. Yeah, yeah.

SB: He says, this is from him, but with some interpretation from Claire Short it says, who's handling the questions, following up from Steven's comments earlier about his own TMJ pain. When the pain kicks in, he's only able to open his mouth about a centimeter, the pain is almost unbearable, and without it resolving from the method he mentioned, laying on his side, he'd say he would be suicidal. Interesting, the pain is to the edge of the auditory canal, not in the actual TMJ itself.

MW: Okay. Okay.

SB: Yeah, so what should he do do you think?

MW: Wow, I would-

SB: He's going to see your multiple MRI specialists.

MW: Well, so the thing is with these guys is they're not expensive up front. You go and see them, okay, they charge whatever they charge for the consultation. They may do an X-ray, they'll do a few manual tests and they say, "This looks like it's a TMJ problem, this is the protocol we recommend." Or they might say, "This doesn't look like it's a TMJ problem, this is more a persistent pain issue," or whatever they perceive it to be. So I always try and encourage people to go for that initial consult and then they at least know where they're at and they can make a decision on where to take it.

But yeah, you can do METs to the muscles of mastication, you can do direct work to them. So those are things that can provide a lot of symptomatic relief. What made me think of that is that of course, if he's getting pressure onto the external auditory meatus or pain in the external auditory meatus, it's probably because the TMJ is pressing against it. So sometimes to do contract, relax type techniques, just pulling the jaw forwards can actually shift the jaw away, decrease the pressure, you can also do the same with masseter. You could go in and work directly on the medial pterygoid and the lateral pterygoid. So there's a number of things he could potentially do to ease some of the tension there, but yeah, it's difficult to say obviously without assessing, and even then, it's difficult to say as you know.

SB: One final thing then before we close for this evening, someone's asked if they can have details of the TMJ study group you mentioned at the beginning because they're interested.

MW: Yeah. Okay. So it's actually called the British Society for the Study of Craniomandibular Disorders. So it's quite a long old name. So British Society for the Study of Craniomandibular Disorders.

SB: Okay.

MW: So if you just Google that then you'll find them. But yeah, they're really sort of top guys and they invest a lot of time and money in training. A lot of the leading training for this is in the US so they're often flying out there to get trained up, yeah.

SB: Who would've thought we could go through 90 minutes talking about the TMJ and still have a dozen or more questions that are unanswered, and who'd have thought that anyone could know so much about the TMJ as well

as all the other things that you know so much about Matt. It's been a real pleasure having you in.

MW: Thank you.

SB: Now, you're coming back in for breakfast tomorrow.

MW: Yes.

SB: Well, before breakfast, and we're having coffee together while we discuss something else. We're going to look at physiological load tomorrow morning I think.

MW: Yes. Yeah, yeah.

SB: We might touch on some of these questions, but if you're happy to do that-

MW: Yeah, yeah.

SB: ... then we'll post the answers to these questions on the website separately.

MW: Sure.

SB: But as always, it's a huge pleasure to have you in.

MW: Thank you very much.

SB: Thank you so much for sharing all your knowledge.

MW: It's always fun.