Unsettled Babies - Differentials and Treatment Option – Ref 262

with Mike Marinus

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TRANSCRIPT

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Steven Bruce
And a very good evening to you. Here we are in the studio for another 90 minutes of CPD, this time about the treatment of unsettled infants. Now, we've put a lot of work into finding speakers on the topic of paediatrics, but perhaps not surprisingly, a lot of practitioners who work in this area are a bit reluctant to stick their heads above the parapet, probably thanks to the rather dubious tactics of the so called good thinking society, and they're even more dubious founder Simon Singh. That means that many practitioners are frightened to tell anyone about what they do, and that means parents are getting a very biased message about paediatric therapy. And worst of all, a lot of very distressed babies are probably missing out on treatment, which could be invaluable for them. Well, here at APM we don't care about Simon Singh and his society, we can say what the hell we like. And I'm really pleased that we found a highly experienced chiropractor to tell us about the art of the possible in this field together with, I hope, his experience of navigating the ASA regulations. He's Mike Marinus who qualified a good 15 years ago now in South Africa, then went on to training paediatrics at the AECC in Bournemouth. Now, of course, the AECC University College. Welcome, Mike.

Mike Marinus
Well, thank you very much for having me.

Steven Bruce
Trips off the bloody tongue that AECC University College, doesn't it. You went there for a masters in paediatrics.

Mike Marinus
Yes.

Steven Bruce
So what did you cover in your masters? Yeah.

Mike Marinus
So it was a great programme, simply because it gave you the option to be able to dive into what you liked, which was always why, when I get people asking, you know, should I go and do a masters my first thought is, rather get experience under your belt because when you walk into something like that, it opens it up and goes, you've now had a taste. And you've had some practical experience, what would you like to understand more of? So what I ended up doing was exactly what I wanted to do, was going into a lot of what makes babies tick. What do babies want? How does the family dynamic work right in that beginning, in those first couple of months, maybe six months, maybe up to a year, and I dove into a lot of some things that were upsetting. Like, I did quite a bit of work into sudden infant death syndrome. I did a bit of work into microbiome, which was phenomenal because then that opened up gut microbiome access to me, did a bit of work into vagus. And then a lot of the work that I did, which is what we're going to talk about tonight, is how do we actually differentially diagnose an unsettled baby, because that really for me is the crux of that. I got a little story that I always kind of think about with this, and I want to put it into the perspective of the practitioner that sees adults, you know, sees, let's say, non-verbally challenged patients, right? So you normally see your patients that can come in and give you a history. The way I see this is you get an adult patient that comes in, but they are so beyond being able to communicate with you

that all they're doing is shouting and screaming, every time you come near them, they pull away, you try to get a sense of what exactly is going on, there's no sense of what's going on. And then you go back to your notes, and you diagnose them with screaming. That's how crazy it is, what we're doing at the moment. And what we're saying is a cholic child or an unsettled child, I like to put it in terms of our adult patients and go the majority of patients that come to us are unsettled. The difference is, we have access to them, and we have access to them being able to tell us what it is so we can get three steps ahead. The trick with paediatrics is, especially the nonverbal guys that you have to make your way through there.

Steven Bruce
And I know we'll come back to a lot of this and you said we're gonna look at differential diagnosis of unsettled babies. But you've mentioned the sudden infant death. And I bet we get questions on that as well. Because I mean, it's all fascinating stuff. But I think probably every medical practitioner I've ever spoken to, and all the consultants and everyone else who I've interviewed in here, they will all say that you only get good results if you apply the right treatment to the patient. And if you can't differentially diagnose a baby, then you can't know what the right treatment for that baby is necessarily. Do you think that affects the lack of evidence for paediatric treatment?

Mike Marinus
Absolutely. Because you can't have evidence if you don't know what you're looking at. And as we'll see in some of the slides, one of the systematic reviews that Sturtle put up in 2014 talks, I think he talked about, we'll see the numbers now, somewhere around the last 35 systematic reviews in colic that he'd seen, 20 of them had different definitions.

Steven Bruce
I interviewed an osteopath, a very eminent paediatric osteopath about babies. And that was the first time I realised, actually colic is not a thing, colic is different things, and you don't know which one of those you're treating if you're gonna get it.

Mike Marinus
Colic is, they don't have it, they do it. It's something that they're doing. The whole point of colic is that you have a well child, you have a child that if you did every test under the sun, about 5% of it, because about 5% of them, we know they have pathology. But for the other 95% you're kind of going well, what could be causing this, wake of this be coming from, what could be, because it's no tests that's coming positive for you on anything that you're doing. But at the end of the day, and this we'll talk about as well. It's more a child trying to balance. But if you don't understand what those little blocks are that they're trying to balance, you've got no hope in being able to treat them. What will happen is, you'll throw everything you have at them, and maybe something will stick. And that's not the way we want to practice. We want to practice by knowing what it is we're working on.

Steven Bruce
Having done a Masters, you will, I'm sure will be well versed in what evidence exists for paediatric treatment. Is there any, evidence I mean?

Mike Marinus
I mean, there's one particularly that always gets overlooked, which was my mentor at AECC Joyce Miller, who in 2012, did a randomised control trial where the parents were blinded from what was happening with the children. And they had a good sample size, and they came out with a very positive result with chiropractic care with colicky babies. A lot of the time, it kind of gets looked at as an outlier. Then again, we have other work that Joyce has done, which I think was 2019 or 2020 where she did a big data study. And she went out and she said to all of the parents that were coming into the clinic and said, how do you feel, number one about the kind of treatment you've gotten? And what are the outcomes that you're seeing? Because then we'll see in that Sturtle's 2014 systematic review, one of the things they never look at is parental response. The thing is, it's the parent that notices the issue. It's the parent, it's the relationship that needs to be fixed by your treatment to get everything organised. So if you're not looking at how the parent feels about what's happened to their child, you're not looking in the right place. Because you can't say, well, let's say the old definition of colic, they say three hours a day, so crying for three hours a day, I apply some sort of treatment, whatever their treatment might be, and I get that crying down to two hours and 55 minutes. I haven't won anything. I haven't changed anything. All I've done is my definition of my piece of paper. I've been able to tick the box. I've done nothing for the parent. So it's that kind of big data that can't really be done in an RCT kind of way. That ends up giving you a lot of good information but because it sits in another realm, it kind of gets washed.

Steven Bruce
You said there that you'd had at least a partially blinded study, that must be quite difficult to get through an ethics committee or at least get volunteers, as parents presumably don't want to leave their babies alone in the care of someone else for treatment, do they.

Mike Marinus
Difficult for chiropractic, difficult for osteopathy, difficult for medicine. The problem is the vulnerability of children. And it's a double-edged sword because they're vulnerable, you can't test anything on them. Because you can't test anything on them, they end up being vulnerable, because we don't know what to do with them. And that works exactly the same way as medications. A heap of hospital medications that are used on babies are used off license because they can't test them. So what they do is they go well, we'll give X amount, but we know very well that the glomerular filtration rates are not the same, we know very well that the physiology is set to be anabolic. So set to be able to draw as much as it can. And we know the half-lives of drugs take a lot longer, we know things like lead will be absorbed a lot more per ratio into a child. So you can't just say that, however, it does happen. And I think that's the crux of this question is to go, the evidence is lacking everywhere. And that's why people are going everywhere to try and find answers.

Steven Bruce
I don't want to get down this rabbit hole too far at this stage, I suspect we met later on, there was a lot of criticism, and it was aimed largely at chiropractic at the time over claims for treating children, wasn't it? I think it was Simon Singh and his good thinking society, they looked at advertising and said, you can't say this, you can't say that. That being the case, is it simply the fact that the practitioner is on the NHS and our advertising that kept them safe, because they've got to be doing something for babies that don't settle?

Mike Marinus
I think perception is always big, you know, if you are perceived to be in a profession that is evidence based, you can kind of do what you like. And you don't have to advertise, you can say what you like, because you're really not going to get looked at. If you're in a profession where the perception is that you're coming from a place of no evidence, and you're coming from a place of not having the patient's best interest at heart and not having all the data around you and not doing risk reward analysis when you treat patients, if you're thought of coming from that side, any claim that you make has a microscope onto it. And I think that's kind of, for me, that's always been the difference.

Steven Bruce
You mentioned some slides earlier on. Just before we go on to the slides, just a reassurance, as always that we will bring them up full screen for a little while. But I think the main purpose of this is for you to be able to look at our speaker this evening. And we will send out copies that are handouts from the slides later on, probably tomorrow after the show. So should we move on?

Mike Marinus
Yes, absolutely. There we go. Okay. So the first thing and this slide is always interesting to me, because not only are we looking at a colicky baby or an unsettled baby, we're not looking at the causes, but a lot of us call it different things. And a name is very, very important. So things like cry fuss is good. It's one of the names that's being used in the literature. When we start to get more into the migraine literature. Now they use things like paroxysmal fussy infants, and I really like that. That's Dr. Amy Gelfand, she's a paediatric neurologist. She's really, really good. And she's now starting to whittle it down and say fine, it's irritability, which is going to incorporate a whole lot of things, so they don't have to cry and go crazy. They can just be grunting and irritating and it happens at different times or what have you. Then, of course, we have our classic colic from 1954 with Wessel and his rooming-in study, what have you.

Steven Bruce
This the three hours crying per day?

Mike Marinus
Yes. So that's where that comes from. So it comes from the study in 1954. And it wasn't even about that. It was a rooming-in study, to check a whole lot of other things. And what ended up happening is Morris Wessel started seeing that there was this three-hour gap and even when he's been been asked about well, back in the day when he was asked about that, he said, well, look, that was the average that we saw. It's not a magic number, two is just an average of, if children were crying for three hours and over, then we saw them to be problematic, and if they weren't then they're not, however, that's changed a lot over time. November 1954 was an amazing time, no one had gone to space yet. I think doctors were still recommending Marlboro. It was a whole other time, and you could have a baby cry for three weeks at a time, it would be acceptable. This is the other thing. The definition has changed because we change, and this is what we're going to talk about in terms of Westernisation as well. Our whole society has changed and we end up blaming the babies, yet the babies have a biological need for something and our lifestyle has moved away from that, so you end up with colic as a fight between biology and culture, which we'll talk about. Then these last few, these were really interesting. I sat in a talk with a psychologist and an OT. And we've all been brought up onto this panel to talk about me about colic, the psychologist about

attachment and the OT about sensory issues. And about half an hour in we went, guys, we are talking about the same thing. We are all talking about the same thing. It's not just in the literature that it's different. Different professions have different names, because of course, we see things through a different lens. So that's also really important.

Steven Bruce
I was going to ask about that. So if you can get back to that slide there, because there were three more, there's irritable infant, sensory infants, attachment issues, would a parent distinguish between those? Would they just say I've got a colicky baby?

Mike Marinus
So, that is such an important question, because at the end of the day, the parent and the baby have a colicky situation. And this is one of the things I tried to move towards when we teach, when we talk about these things is that the child is having a difficulty within their environment. So their internal environment, their external environment, the parent, though, is also having difficulty with their ability to respond to their child, they're also having difficulty in their ability to soothe. Something between the two has gone a little bit awry, which is why I like things like attachment issue and talking about it in terms of that, because a lot of the time we'll go, oh, the baby has the problem. And it's one of those things that because as adults, we have the power. And as babies, they don't have the power, we kind of go well, this is the environment you live in now. And if you can't function properly in this environment, you get the diagnosis, you get the treatment. But at the end of the day, the way we work with them is a lot broader than that. And it's to start to teach parents to read cues and clues from babies and start to teach them to do things that the baby is biologically expecting. So things like skin to skin time, more caring time, when they transport them to be able to transport them holding and not transport them in buggies and that kind of thing. Because all of those have consequences. And one of those consequences is that your child ends up unsettled. But unsettled infant is the wrong wording. It's unsettled dyad or unsettled family, because that's what you end up treating.

Steven Bruce
Just elaborate, if you wouldn't mind on what you mean by attachment issues.

Mike Marinus
So Bowlby, in the 60s, was a wonderful psychologist that talked about attachment and attachment is all about those first 1000 days. And it's all about, how does the infant's nervous system correlate and work together with the parent nervous system. And today, we can kind of take Bowlby's ideas and put them together with Porges' idea of polyvagal because they really work so nicely together, of how those two link up and that linking happens within those first 1000 days. But the trick is, it generally happens once quickly and forever. So the way that you are attached initially ends up giving you your outcomes as a family. One of the really interesting things is your bad signs or your fallout from having a colicky baby tend to be relationship-based things. So they tend to be, how well does the child do in school later, it's one of the things that they'll check. But that very much has to do with how much input and investment does the parent or the family have in the child to be able to help them with that. And a lot of those outcomes you can really whittle back to going how much investment has been put in from both sides.

Steven Bruce
I'm sorry, I asked a question, I just anticipated that somebody might say, well, are we talking about feeding issues here and latching on, which sounds like attachment issues, but we're not, we're talking about interpersonal attachment.

Mike Marinus
And those are in there as well. But that's a really great point because that is the focal point of having a poor, just attachment generally feeling is a hotspot for that because feeding has so much emotion around it. And there's so much guilt that lies around it. And it's one of those things that if you feel that this is not going well and you have a child that's fussy and the other boxes are not being met, feeding becomes one of the main things, breastfeeding is one of the main things that's dropped with a colicky baby.

Steven Bruce
It is extraordinary, is it not? It wasn't that long ago that people are actually recommending that women didn't breastfeed their babies. Extraordinary.

Mike Marinus
Yeah, I still remember, I can't remember where the girl was from, but it was on the national news in America, where she was trying to explain that breastfeeding should stop being seen as natural because this is causing a problem. And what we forget, and this is where we're going to talk about Westernisation as well. With things like SIDS research and with feeding research, we forget that we have more than one bed in the household. We forget that it's an option to move a child to another bedroom. We forget that we have formula, that we have formula and other people just have no access to this. So it's a very sort of blinded, and is a wonderful, I wish I could remember the guy.

Steven Bruce
So you don't mean we forget there's another bed, we just take it for granted.

Mike Marinus
We take for granted but what we forget is that 90% of the world doesn't have another bed.

Steven Bruce
My daughter would argue that she knows damn well, there's another bed for the baby. But it won't sleep there, it has to sleep with her.

Mike Marinus
So she knows, and this is the point, she knows that the evolutionary epoch in which her baby developed, in which that human baby with all of that neural integration popped out, and what it's expecting is the Savannah, it's not expecting a three bedroom, two bathroom in Northland. And the problem is the moment that it separates from Mum, the having no smell of mum is not a, oh, where did you go, it's half of me is missing. And these are the things we don't understand about them. Because we've kind of gone well, we know that that's there, why don't they understand, so exactly to your point, that's exactly the kind of thing that we have to break down and not in a judgmental way, it's a way of going, if I open this door for you, you can see how many things you can actually do to be able to help.

Steven Bruce
So it sounds then that a lot of treating the unsettled infant, that being the topic of our conversation is actually treating the mother, or at least educating the mother if not treating her.

Mike Marinus
And educating everyone that's around their child. So if it's the father, if the grandmother that lives in the house, if you have someone in there, that's kind of against what's going on, it becomes very challenging as well. So one of the things we teach about a lot is that this is a family relationship based problem. And that's how you have to work it. Because also, you have to give people tools, this is one of the worst, I literally had this this week, where mom came in and she said, I've been told by a health care provider that my baby is fine. One of the most detrimental things you can say because the only thing that's been said there is that the baby is fine. Mom knows there's a problem. So the mom goes, well who else could the problem sit with, and the only one left, it must be my problem. And then you degrade her confidence. And the best way to spiral down into having a more unsettled infant and unsettled family is to have a parent with low efficacy. So that's one of the big things is to open the door, be able to say, look, I want to give you these tools, I don't want to reprimand you for what you're doing, or why am I going to give you all of the you know, layer on all of the Western world's woes onto your shoulders, I just want to show you what you could do to make these things easier that are maybe not the things that you've been told about. And it has a very chiropractic essence to it, osteopathic essence to it, because at the end of the day we're looking at, now we're not just looking at the whole patient, we're looking at the extended patient.

Steven Bruce
While we've been talking Salome Olivia sent in a question here saying, in your opinion, do some babies get unsettled and angry at the end of the day? Well, obviously some do. I think she's probably saying is that a more likely time of the day for unsettled babies.

Mike Marinus
Absolutely. And there's a very, very good reason for that. Because, and here's the other thing, which is a little bit of a mind bender, is that human babies are born three months premature, because we ended up standing upright. So we've got a smaller pelvis, we've ended up having this in civilisations, we have this really big head. And so nature kind of organised this way of going well, if you want to be able to have a small pelvis and a big head, we're going to have to birth these babies three months early. So one of the things that it does, is it changes some hormonal things. And what you find is that you don't have melatonin for the first three months and melatonin runs that sleep cycle. So you don't have that calming effect coming in. But what you do have is serotonin, and serotonin gets kicked out of that baby's system at 5pm round about. Serotonin is wonderful, does a lot of good things, but what it does, is it aggravates the smooth muscle of the tummy because it's still really soft, and it needs that hormonal extra tension to be able to push through. Without having the melatonin and having that, that's why we get this 5pm witching hour, there's that, there's also a migraine idea that only Gelfand came up with, which is where you get all of this input through the day. And then you get to the point where you peek and now you have to release it. And as we know, babies don't have their nails to go get done. They can't go play golf. So at the end of the day, they sit with you and they and they offload.

Steven Bruce
Yeah. That's fascinating to know and I don't treat babies. But now and then I will have seen a mother who, during the course of a normal treatment will say, my baby has pain in the neck, is there any chance that during the course, because I know we're going to do some practical, are you going to show people who are not trained, experienced in treating babies things that they might be able to do to help hold or does that require a longer course?

Mike Marinus
So what I'm going to do is show one or two things that you can take in your practice right now that are going to help. So one of the things we know is that these children are irritable. And if you can remove anything just to get a bit of that irritability out, it works like a charm. So we're going to talk about helping them get some gas out and we're going to talk about helping them get some burps out. That straightaway just makes the world of difference.

Steven Bruce
I should have told people in the introduction actually that you lecture around the world on this topic, don't you? You're not some bloke from a clinic in Southampton who's made the trip up here for an interview. You are good at this stuff.

Mike Marinus
So yeah, it's became a passion of mine, I think. And you know, the more families I work with, the more it becomes a passion. Yeah. And that was part of coming to the UK was to be able to be around, to be able to go and teach, getting involved in that now, which is also part of being here, which is good fun. But at the end of the day, yes, this is where my master's was focused. This is where my teaching is focused.

Steven Bruce
Someone called HG has asked, how many troubled babies do you think have mothers who have emotional difficulties? And I guess the implication there is, is it the emotional difficulties that are prompting the unsettled nature?

Mike Marinus
Absolutely. Well, we know, if you have a caregiver that is stressed, that means you have a sympathetically dominant nervous system, trying to listen to cues, and they miss those cues. And the more they miss those cues, the more the child has to shout louder and louder and louder. So a lovely way, HG, a lovely way of explaining this is, if you were to go into a restaurant, let's say you're a baby, because first of all, we think that being unsettled and crying is the first thing that babies do, it's the last thing that they do, okay? You go into a restaurant, and you sit down at the restaurant, and your lovely date is there and you're waiting, and you put your hand up to try and get someone's attention and they walk right by you. Fair enough, the next time they come, you go, could you, and they will, eventually you're gonna get up, you can stand in the middle of the kitchen, you're gonna shout and lose your mind. Babies are very much the same thing. So babies have a body language conversation they'd love to have with you, but they have to be on you. And if they're not on you, they miss that. Then they have their pre cry, which is the little goo and gas and those all have little meanings that you can pick up if you know what you're looking for. It's only when that doesn't work that that graded severity starts to kick in and they start shouting and

screaming. So if you have a caregiver who's not sensitive to those cues, and we know that postnatal depression dampens your sensitivity, it dampens that input. That's not great. So that's why working with like postnatal depression is so, so important. But absolutely right. And what we know as well is that if you look at children that are taken to an emergency or to an A&E with reflex, it's a fivefold more likelihood that that mother will have some sort of psychological something going on. If she arrives with a child at the A&E with reflex.

Steven Bruce
Doesn't just have to be postnatal depression, does it, there are lots of people living in very stressful households or environments, maybe several other kids or whatever else.

Mike Marinus
Absolutely. See, you bring up such a such a valid point it because it's not like that three hours. Okay, let's take two very separate things. Let's say we have Angelina Jolie who has a million kids and she loves having children. And it's a wonderful pastime, she has a million people that look after them. And I'm guessing she collects carers staff to be able to look after them. And let's just say for example, she has all these carers, she has all this resource, she's wonderful. She loves working, and her child cries for eight hours a day, let's take a ludicrous thing like that. But then we have Lucy on the other side who has three children and as many jobs and she's a single mother and she's stressed and she has no funds. Three hours of crying is not the same, because you're inputting the same variable into very different situations, you're gonna get very different outcomes, which is why, what is excessive crying, or what is an irritable baby. It's whatever the parent says it is. And you have to then work from there. And you have to have your bias away. And you have to work from there.

Steven Bruce
We're half an hour in, we've done one out of 12 slides. It's possible we might not run out of things to say this evening. Bisby says, has it ever been shown that newborn babies have a higher sense of smell than the adult? That is to say, many adults can't recognise their partner by smell alone. Do babies really smell their mummies missing and cry?

Mike Marinus
Oh, we are playing with a team tonight. Okay, absolutely. Right. So we go through a pruning, right, at a good couple of months, you've made your basic connections and whatever is not made, that prunes out. Babies start with four smell centres in the brain, we pruned down to one smell centre. And we can see that very well in what they call the breast crawl, which is where a baby is born and put onto mom's belly. And because amniotic fluid smells the same as colostrum from the breast milk, they will start to make their way towards the breast just via smell, they will find their way towards the breast. So their sense of smell is immaculate in the beginning.

Steven Bruce
How do they do that, it took my grandson ages before he could crawl.

Mike Marinus
So it's this sort of lumpy sort of bumpy, like looking around and trying to find their way, and there's actually there's nine stages to a breast crawl as well. It's a fascinating thing to look up. So at the end of the day, it's absolutely right, smell is the way that they connect. And that's one of the things that, and this is actually a take-home thing that folks can do right now to give the parents a little bit of respite at home, is they smell you. So what you can ask a mom, if she's got a really clingy baby. It's like baby's only happy when they're right on and then you put them down and they start again, what they're doing a lot of the time is they're missing the smell. So what you can do, especially if you're breastfeeding, you take the shirt you were wearing, you rub it, I mean, you make it smell as much of you as you can, pop it down onto the sleep surface, take a hot bag, put it on there and perfuse that smell through the sleep surface. As the baby pops in, you take that out and you basically made a smell cardboard cutout for baby. So what they'll do is they do this thing called conscious unconscious, is they'll sleep and then they'll come to you slightly and they'll go, because babies only really allowed to be in light sleep, they have no melatonin, so they'll sleep almost come to and they'll go, can I smell mother? If I can smell mother, then I go back to sleep, which is why they sleep so well, when they're with you. But when they're not, they wake up, they go hang on, she's not there. And that's not a, she's missing. That's a danger sign. So then they're up and they want you. So absolutely. I mean, it's a really, really good question.

Steven Bruce
I'm gonna take that one away for my daughter, because, yeah, my grandson is a bit of a nuisance at night.

Mike Marinus
Here's another one you can pop in as well, which is really good, which works well with that, is people always want to put babies down headfirst, and then bum second because they want to protect the neck on the way down. The issue being that you have a gyro in your head and that's why Thorpe Park is so nice because it spins you upside down on all the rides and it makes you awake and it gets your adrenaline kicking. If your head goes underneath your bum, that gyro kicks in. So this is another thing, if you're going to put them down and you want to get that smell going pop them down bum first, head after, all of that together. And also the heating it, means that you don't lose the heat from the mom's body onto the baby bits. Those three together, such a winner.

Steven Bruce
Right. Simon says, is there a natural alternative to serotonin that can be administered? You suggested you don't want an alternative, you want some melatonin.

Mike Marinus
Yes. Yes. So interestingly, melatonin is a subset of serotonin, they come from the same place, but, and I think what we're trying to say there was, can you give a version of melatonin. So we know that they're giving it to migraine sufferers, and they're starting to get good results with this. And we know that together with that, we know that sleep is linked up in that and we know that sleep and migraine have a lot to do with each other and migraine could be very much behind colics. We know all of that.

Steven Bruce
So giving melatonin to migraine sufferers.

Mike Marinus
And it's helping the migraines and it's helping the sleep. The issue is that there's a very good reason that they don't have melatonin, is that you can't have babies in a hormonal sleep pattern. Babies for the first three months are eating machines that are not allowed to go to sleep like that, so they can only go through light sleep and then wake up and feed. You can't run the risk of having a baby that's at that age, going into a chemically induced or melatonin induced sleep missing a feed.

Steven Bruce
This is the three months and you're saying they should still have been in here.

Mike Marinus
Exactly. Exactly. And they should still be getting consistent food all the time. So yes, there is an idea behind that. But the thing is, it's a non-starter because they're not allowed to have melatonin yet.

Steven Bruce
Okay, hopefully that satisfies some. HG again says, does skin to skin stop working at a specific age, surely not. So what is the skin to skin mechanism? It's not hormonal, it's not neurological, surely touch to touch between adults is also using the same mechanism, which is what?

Mike Marinus
Yeah, it is. So the same hormone that relaxes babies is the same hormone that makes babies. So at the end of the day, it is relatively hormonal the skin to skin and you do create a hormonal storm with having skin on skin. Now, one of the first parts about this is that you have to be very careful in practice when you ask did you have skin to skin because a lot of parents will say yes. And then when you investigate further, it turns out the baby was wrapped up in a blanket when they were put on them. This is not skin to skin, that's two people near each other with a blanket between. So skin to skin, it's all about getting, blanking on the hormones now, but oxytocin is the big one and oxytocin is the quiet one that you want when you are having your baby. It's the hormone that comes out when you are in the throes of making your baby and it's also what ends up, especially in mothers in the connection with the babies in the first part. So having oxytocin and having skin to skin just allows that storm to kick in and it never goes away, skin to skin is always a calming thing for both participants.

Steven Bruce
Interesting question on that very subject from Robin here. At least it's interesting to me. He says, for that reason, would you recommend that mothers shouldn't wear perfume or scent? Is that going to confuse the baby?

Mike Marinus
It's such a good question because it normally skips a generation. And the question normally gets told to the grandmothers, I'm not sure why the grandmothers always get hit with this. But the grandmothers are always told, stop wearing all that perfume. Because the baby goes and there is a bit to that, babies are

looking for your natural scent. Again, I've got to be very careful because I don't want to take the moms everything away from her because this was a lot of the time what it feels like is that you can't eat this. You can't have that, you can't smell nice. You can't look nice. You can't this. Is there truth in what they're saying? Absolutely, absolutely. Because they connect via smell. So it's actually something that I, thank you for that, thank you, that's something that I'm gonna go and investigate, actually, because it theoretically makes a lot of sense. Yeah. I'll leave it there.

Steven Bruce
Robin always comes up with good questions.

Mike Marinus
Thanks, Robin.

Steven Bruce
HG again says, bath water comes baby's down rapidly?

Mike Marinus
Yeah, it does indeed.

Steven Bruce
Human body's mainly water, how different and how similar are these two types of water contact?

Mike Marinus
But HG remember, keep in mind that for nine months, babies are sea creatures that only became land mammals very, very recently. So the moment you put them back in water, which has a compression on them, the moment they've gone back to that amniotic fluid again, that is really, really calming. The thing that's very just uncalming is then removing them from the bath because again, that takes everything away, and it's a big temperature change again, babies like what they know. And so getting them into the bath works like a dream, but it's more theoretically, I'm speaking from the theory. I mean, it could have to do with diaper contact and what have you, but at the end of the day, it's warm water, and it's them being submerged in water, which works really well. Okay.

Steven Bruce
We're gonna move on.

Mike Marinus
Okay. So we've talked a lot through this and I just want to make the point that fussy babies, unsettled babies. It's not one group. This is like hip dysplasia. It's a spectrum of different things. It's like, take your pick, cerebral palsy, it's a spectrum of things. You can get grizzles and grunts right on the one side all the way up to unsoothable screaming. It's multifactorial, and the whole thing is, there's a lot of interplay. So there's genetic interplay. You can have a baby, because we know now that colicky babies have a much higher chance of having a migrainous parent, migrainous mother, and if you were a colicky baby, you have a much bigger chance of having migraine yourself, so we know that there's a genetic predisposition. Because when I say migraine, I'm talking about hypersensitivity, not particularly head

pain, because children will have it more abdominally in babies we think, express it this way. Then, of course, temperament also has to do with our Westernisation. We think they're playing up, but they're not getting the things that they're biologically need, neurodevelopmental maturity, maternal prenatal stress, which is a huge thing, because maternal prenatal stress changes a lot of the nutrition down through the placenta into the child. So it can end up in a chemical constraint to the child as well. And then birth complications, parents psychological disadvantage, it's crying, feeding and sleeping, these are the three things that interact with each other. Because if a baby is understood to have three jobs, it's getting someone's attention, it's getting food inside them, and then it's relaxing to do it all over again tomorrow. And it's those three things that interplay with each other. A lot. Okay, so if you look to this side of the screen, that way is where your colic babies go, if you look to that side of the screen, that's where the unicorns are, and the unicorns are basically just and this wonderful OT lecturer friend of mine came up with this, her book is all about the unicorn babies and these imperfect babies. But these are all just to explain to you that there are different kinds of unsettled babies. So our first one, the baby's uncomfortable, mom knows life could be easier. She's not going to get any diagnosis of that baby because they grunt a little or they just, they don't respond to the care that she's putting in. She starts to be worried about the relationship but there's no screaming, so there's no red flag. So she falls through the cracks. We don't try and help her because we try and explain to her she doesn't have a problem, instead of saying what we could do to help her. Then we have the grunting baby.

Steven Bruce
That's an important communication issue there because you didn't say, you tell her the baby's fine. You explain that what is going on is normal. And so she's fine and the babies fine and you don't expect anthing different.

Mike Marinus
Yeah, yeah. Thank you. Absolutely, absolutely. The second one is what we're going to talk about when we go to the bench just now, the grunting baby. The grunting babies are babies that have dyschesia. This is a big part of what I do, is work with dyschesic babies. We all think it's constipation, but these are the kids that push down for 10 to 15 minutes, they get purple in the face, they scream, and they push, and they end up with normal poos or they end up with no poos at all. And at the end of the day, they end up getting constipation medication, which is the wrong thing. It can make reflex worse. And it's something that you can do a lot about. And we'll talk about that now. Then you have the child that fusses, but they don't go into a full crisis. So they don't have that, what's the word I'm looking for, that red flag that's gonna make people sort of jump and start helping you and do whatever, then we have the child that cries, but can be settled with loads of work. And I love that one, because this is the one where the parent will go, because we know one of the definitions is to say it's unsoothable. So if they're rocking the baby this way, and they're running this way and got the music playing. And then the baby calms down, they're like, it is settleable, but it's not manageable. So that's the other thing. So all of these exist. And it's to understand that you can interact at different levels with all of these different folks.

Steven Bruce
And then off the spectrum over there are the ones that we can't see, have they got colic?

Mike Marinus
That's where you now have to start digging in. So now we start to dig into more like, is it a pathology? Is it a lactose intolerance, is it maybe a reflux that's involving acid or that's not involving acid? Is it a microbiome problem? So this side, we have to start getting our oh, what's the word I'm looking for? Well, my words are leaving me now. This is where we have to start getting our diagnostic skill better and better.

Steven Bruce
So let's move the slide on to the next one, please, Justin.

Mike Marinus
My clicker is gone.

Steven Bruce
Justin, can we move the slide on? Thank you.

Mike Marinus
Lovely. Okay, so this is the one we were talking about. This is the systematic review that shows the 20 separate definitions used in the last 39 colic trials. So this is the problem, when you start making claims and saying, well, I can sort out a colicky baby, what are you talking about? Okay. And then when you say, I can sort them out, of those papers, 11 of them had different definitions of improvement. So what are you sorting out? What's the thing that you're fixing, and there are 28 different interventions and 19 different outcomes. So it really is, this is the problem. We've got this adult patient that's coming in and screaming at you. And you've diagnosed them with screaming, and you can't work out well, we can't fix them. And the minority of these trials use parental perception, we talked about this, it's so important to look at how the parent feels about what's happening. Okay, many effects involve the relationship, we talked about that, we talked about the fact that cessation of breastfeeding is a big thing, harms scholastic achievement. And then of course, this definition changes over time. And the definition we're sitting with now is the 2016 definition, which goes more up to five months. So we've left the three months behind. And the reason that has gone up to five months is now we know that if that kind of unsettled crying happens after five months, now it's an issue of development, because we understand that under five months, they're underdeveloped, and this is a way they'll respond. But over five months, they shouldn't respond that way. And the new definition talks a lot more about the fact that it has to do with the whole situation and not just the baby themselves. So the definition has moved on.

Steven Bruce
First port of call for many mothers with a baby who they perceive to be colicky or unsettled, or however they choose to define it, is likely to be their GP I'd have thought or perhaps their midwife or the postnatal nurse, I forget the correct title of that, will they all be aware of these changes, do you think in definitions and protocols behind them?

Mike Marinus
See this is the thing, it's quite a niche area to work in. And if you don't spend a lot of time in it, if you don't go and look for it. It's not just there, there's going to be no newsletter out with this kind of thing. The other problem being their first port of call is going to be Facebook and their peers. And that's where things go

really down the tubes. My wife works on a lot of these different groups. And some of the things that get said on there, first of all, when they say in my honest opinion, you know, the biggest blame game is about to come up. And people are really rough with each other on those groups, and they get quite bad advice, because the problem is everyone has an N of 1 or maybe they have an N of 3, you know, at very best. And at the end of the day, they're giving out advice like well, this is exactly what you should do. And the thing is some of that advice hurts. So if you say, you have to go on reflux medication. Here's a wonderful story. Paediatrician mate of mine in South Africa, we were sitting having a chat one day and he said, you know, I know that a proton pump inhibitor is bad for children. I know it has effects on their bones.

Steven Bruce
It's bad for adults.

Mike Marinus
Yeah, exactly. It wrecks their microbiome. I know these things, here's my problem. When the mother comes in, she won't leave my office until she gets a proton pump inhibitor because a friend has told her that that is exactly what she needs, and I have nothing else to give her. I don't know what else to give her. I'll send it to you. But I don't know what else to give her. So I'm in this position, I'm going, what do you want me to do? And I mean, he was quite forthright to that saying some of them are, it's hard not to.

Steven Bruce
So we actually, we have a role, even if a patient is not coming to us, a parent is not bringing their baby to us as a patient. We do have a role as primary health care practitioners in educating people to understand that Facebook is possibly not as well educated as a paediatrician.

Mike Marinus
Absolutely.

Steven Bruce
Or a paediatric osteopath or chiropractor.

Mike Marinus
Yeah. And we've all got our own roles to play. So the role that I see chiropractic and osteopathy fulfilling is much wider than the trial that goes, they came in, and I did this manual manoeuvre on them, and then I sent them away. There's so much more around there, because that's not being filled. And what I find is a lot of parents will be happy to come because, this is gonna sound wrong, but the threat of medication is never there. So it's not that they'll come in, and now oh, I'm going to be put on an antibiotic. Oh, I've been put on a reflux med. And the problem is if they get put on it, and they don't take it, now there's all sorts of blame and everything. Well, you didn't do what we said to, so almost coming just to talk without the threat of that happening, to be able to go what are my options, and I find that we always get put in a very interesting position because I have to come up with 50 other non-pharmacological pain suppressant manoeuvres that we can use. So I have to be looking for all of that kind of stuff.

Steven Bruce
Your lady who had the conversation with their paediatrician, she must have been told by somebody on Facebook or a friend, whoever it was, that the proton pump inhibitor had worked for that baby or is it simply the question that the person who advised her wouldn't have realised the damage it was doing because it takes too long to manifest itself?

Mike Marinus
So I think there's so much to unpack with that. The one is we know from the research, it does nothing with unsettled babies. It's brilliant at stopping acid production. But when you try and put that against the unsettled nature of the child, we know that it never correlates, it never works out. There's the bias of hindsight, where you have someone that's now messaging on a group going, that was what worked, many things could have happened at that time. And now we can't quite remember, I mean, we've all got those patients that come in, we get it regularly, when the baby comes in, and the mom says, you know, my friend Jess said you sorted this out in two treatments. Well, thanks, Jess, because that's not going to happen. That's not what happened. If I look back at my book, I saw Jess at least eight times and I followed up with her after two months. But the way Jess felt, it was cricket easy and we were done with it, which is fantastic. Because that was the perception I wanted to give Jess. But at the end of the day, the recall is a little biased. So those things will happen.

Steven Bruce
More questions have come in. Emily says, any amazing tips for postnatal depression mothers? Not necessarily to do with the baby, but for the mothers themselves.

Mike Marinus
You know, it's such an intricate thing. Okay, here's the first thing, is, again, this is not particularly a tip for a mum, but it's a tip for a family, is to get other people in the family to watch out for the signs. Because the mom is going to not be great at being able to see that because mothers have a lovely brain architecture change, and they'll do anything and everyone else comes first. So they won't be the first one seeing these signs. So what we do a lot of the time is to teach dads to look out for things like language. So one of the things we often talk about with dads is to watch out for when mom starts to speak about the best things in bad terms. So to say, oh, today, which was a wonderful day, today wasn't too terrible. Yeah, those kinds of little things. But it's to be able to pick those signs up. And the biggest tip I could give you is to get them to someone to be able to work that out with someone professional.

Steven Bruce
We have to be careful not to cross a boundary here into an area where we're not experts. There are good resources I believe out there.

Mike Marinus
All we want to be as triage experts. I just want to be able to be an expert of going hang on, that's not right and also to be able to go, I have a path for you to follow, and then be able to work in that and have a specialist there. But I think like we said already, it's also a spectrum we go right from anxiety all the way down to the postnatal depression and you really have to be careful about it. But to pick it up and to get it sorted means that within that first 1000 days you get everything kitted out and sorted out.

Steven Bruce
Annabelle says, if being in water is calming due to the pressure on the skin being similar to in utero, what about swaddling? Is it good or bad?

Mike Marinus
Oh, swaddling is such an interesting one. Okay, so let's first talk about swaddling in terms of that there is healthy and unhealthy swaddling. We know that hip dysplasia is being changed to be called developmental hip dysplasia because it's no longer congenital because we know it can be made worse as time moves on. So what we know is that if you are going to swaddle, if your choice is to swaddle, you have to swaddle from the top, but you have to stop at the hips, you can't have baby's legs extended and their legs internally rotated, because that's going to aggravate, and that's going to cause trouble. So the Australians are wonderful with this, they've got something called a healthy hip swaddle and you can buy it, it's wonderful. It's a swaddle that has lace at the bottom, so you can do nothing around there, which is great. The problem is that we are worried that it kicks in the parasympathetic nervous system, but the wrong part, we're worried it kicks in the dorsal vagus, and that is, instead of rest and digest, that's freeze. So what ends up happening is the baby's going to this freeze when they get swaddled really, really tightly and ways of checking that, there are two ways that are really, really good, three ways in fact, the one is to put your hand on the baby's heart and they shouldn't be racing like crazy. The other one is to check if they get those little crow's feet on the side of the eyes. And the last one is to pop your hand in to see if the palms of their hands are sweating. Weirdly, sweating palms is very, very good stress, it's got a lot of reliability behind it to be able to tell that a baby is quite stressed out. So we're not sure about swaddling at the moment. It works with the majority of children, and I use swaddling in one or two manoeuvres that I'll do, so if I'm doing like Harvey Karp, this wonderful paediatrician has this five S's, which calms the baby down very quickly. I'll use it with that, but I won't keep them in there, but it's a hot topic.

Steven Bruce
I'm curious. What's the normal resting heart rate for a relatively newly born baby?

Mike Marinus
It's high. It's higher. It's not with me.

Steven Bruce
I have in my mind it's somewhere up near 100.

Mike Marinus
I'm sitting between 95 and 100.

Steven Bruce
Yeah, so if we're looking for a racing heart, we're looking for considerably faster.

Mike Marinus
It's like a butterfly. Yeah.

Steven Bruce
Simon says, what is the research between colic and migraine, which you were talking about earlier on?

Mike Marinus
Okay, Simon, go and look up a wonderful lady called Amy Gelfand. She's the one that's been doing a lot of this work. I think she probably has about six or seven papers out now, all over PubMed, go and have a look for them, they're right there.

Steven Bruce
She's great. And I'll try to remember to look those up and send the reference out in an email after the show. Simon also says he gathers the latest research shows that the baby's stomach is in fact neutral pH.

Mike Marinus
Yes, so it's a very, very interesting setup. And one of the most interesting things about that is that milk works against acid. So the milk suppresses the acid and the milk keeps bringing it to that neutral. Now, this is a very true comment in terms of having a little bit of food all the time, where we again, in our Westernisation, where we push to have babies feed every three hours, if you move over two hours, now you don't have breast milk to be able to work against that acidic pH. And now you start to get a resting pH level that goes up. So that's all based on having a baby feeding relatively, so having a feeding on demand. So if you test those babies, they generally have a neutral pH.

Steven Bruce
Okay. It wasn't quite clear there what you said is a roughly normal average feeding cycle for a baby. Or is totally different?

Mike Marinus
Yeah, so what we do now is we say, somewhere between three and four hours, that's generally the advice. The problem is that advice comes from formula feeding, doesn't come off breastfeeding, breast milk and formula are very different from each other. And breast milk is designed to be able to be taken in very, very quickly. Okay, so here's an interesting story. In terms of, it's our breast milk that gives us a way as a carrying species. So our breast milk has high carbohydrate, low protein, low fat. If you look at a tiger, they have low carbohydrate, high protein, high fat, their babies get put in a nest, they go off and they hunt, and then they come back hours later, and they feed them again, the protein and the fat are there to be able to let them better regulate to be able to lift them and to be able to give them really chunky food to digest over time. Without high carbohydrates, carbs go through you very, very quickly. We don't have the protein and the fat to be able to thermoregulate, so what we end up with is having babies on us and if we look at every other primate that works the way we do, they have constant feeding all the time. So what we should really be doing is having a baby on your hip, your baby on you, having a sip and stop. That's the mammal way of feeding. What we've done is broken it into times because we've got longer sleeping times and feeding times. All of those are westernised things that we do and their biology will fight against that. Now, the thing is not to misconstrue this and say that that is how you have to do it, some children will be fine with it. But it's understanding what is biologically appropriate, and what we're

doing. So it's understanding that rye bread and avo and a McDonald's burger are both food, but it's understanding that they're not the same. And that's the kind of idea between those feeding cycles.

Steven Bruce
So new keto diets for babies then.

Mike Marinus
No, in fact, in South Africa, we have Banting, the Banting diet, which is where you want to drop a lot of weight. And those are low carb, high protein, high fat, so this is basically anti Banting.

Steven Bruce
Does it affect the baby if the parent is on a keto diet, in an effort to lose weight, perhaps.

Mike Marinus
So it is interesting in terms of that you have to have, breast milk doesn't just pop out of nowhere, breast milk has to come from the constituents that you need. So it depends if you are normally a Keto dieter, you will probably be okay. Because you're carrying on doing what you're doing. And your baby has developed within that environment. And now you're okay. The problem is to have a baby and now go now I'm only eating nuts. That's not the best idea. So it depends on your physiology.

Steven Bruce
I remember that advice being given, I think, to my wife when she was pregnant, it was, now is not the time to take up triathlon. But if you're already doing it, you can carry on into that becomes uncomfortable,

Mike Marinus
Yeah, because it's the internal environment mustn't change too much.

Steven Bruce
Bisby says, have you got any tips on how to approach chatting to the mother, that the fussing might be a dyad event without making her feel villainised or inadequate or the cause of it.

Mike Marinus
Absolutely. All you do is give her things to do. All you do is give tips. You don't talk about what's going wrong, because that doesn't help. All you do is it's all about positivity. It's what can you add? What can you add to, a wonderful Australian mate of mine, Paul, talks about having the helpful basket and the unhelpful basket. And I love that. Because then you can say, look, these things that we're doing are great, but they kind of belong in the unhelpful basket. Let's fill the helpful basket with these things. And let's try and just take that energy that she's putting into it and just push it in the right direction. There never has to be a time where you say, well, that's wrong. All you have to say is, that's great. If we did it this way, this will be the outcome. So it's just about deflecting and moving on to the right path. Because at the end of the day, it's not about me winning and her being wrong. And her seeing how amazing I am. It's all about, she has to be the hero. And I'm just the guide on the tour. So it's all about, it's really Luke Skywalker, no one tells him he's wrong. They just go point at over there.

Steven Bruce
Right. Tracy says that she teaches and uses your baby birthing method with every infant that she sees, every effort to get to avoid the air going down for painful wind later in the day and it really works. Oh, cool.

Mike Marinus
Yeah, we're gonna talk about that just now.

Steven Bruce
You want to do more of this first or should we go over there now.

Mike Marinus
Let's go. Let's go.

Steven Bruce
Let's go poke a baby.

Mike Marinus
Yes, indeed. Indeed. Well, we talked about that. So let's start up here. So let's start up here. Okay, so this is Travis. Travis, the travelling doll who my daughter named him. So Travis comes all over the world with me and teaches all over the place. Okay, so what are we going to do now is, we're going to talk a little bit about burping. Now, this is stuff that you can give to your parents straight away. And it really, really helps. Okay, so the idea of how we would normally burp a baby is like this, we'd sit them on our lap, have them right up over like this, and we sit and pat on it. The problem is that at two in the morning, this becomes this. So we want to take the patting away. Also, if you sit and pat on them, what ends up happening is you break down those bubbles, to be able to burp a bubble out, we want to have a big air bubble. So you don't want to fracture those bubbles. Because if you do, they'll go down. And then we're going to have three hours of trying to push in heave to be able to get everything out. So we don't want this, also, these a lot of the time, our refluxy babies, refluxy and colic babies go into this pistatonic position and they like to go into this extension, that's going to cause inflammation at the back. So if you want to keep your baby asleep, that's not what you need to do. So that's not what we're going to do. So what we're going to do is get them into this little grip with this thumb on the side and our two fingers over there. I've got baby right up against me here, my hand here, my hand here and I'm going to get them as straight as I can. Because what we're trying to do is I want to get a straight pipe between the stomach and the air because burping is passive. So if I can get the high pressure in the stomach to connect the low pressure outside, the burp will pop up and that's what I'm after. So it's much more about this position then this.

Steven Bruce
That is even quite forceful there, with poor little Travis.

Mike Marinus
Travis has been through it. But absolutely right because everything we're doing is no more force than you would put on your eyeball. So you want to get them right on in. Hand over here, over here. This is wonderful for people with big hands. If you have smaller hands, you put them this way, hand goes behind.

And you can have them like that, just as long as we're nice and straight. Now the trick to this is to get a little bit of a bounce. So my leg would be down here, and it's a little bit of a bounce underneath. So what I'm trying to do is get the air bubbles to move around so that I have a better chance of them popping up. So we've got him straight with a little bounce underneath. So that's kind of the first position. Second position that works really, really nicely is to have Travis here, underneath, and I'm going to lift underneath there, and then I'm going to bounce again, because I'll be seated on a lower chair. The idea here is I'm lifting the diaphragm away from the top of the stomach, and I'm making a little bit of space for those air bubbles to be able to pop out. The last one is for the dads that works really, really nicely where we pop over the shoulder here, and we come underneath onto the leg. And it's a little bit of a wobble down like that, those three to move around works really, really nicely.

Steven Bruce
And lots of people, of course, will put the baby here, but I doubt that many people thought about doing that.

Mike Marinus
So there are two problems. So the one is if they go here, all of this crunches up underneath. The moment you get them to hook over here, they get to extend and release. Now the problem is, if they're up here, that way, everything gets tight. So the whole idea of this is to get the pelvic floor moving slightly so that I can get the stomach to be able to move, I want to have them nice and straight and a little bit of a wobble underneath to be able to move out. If I can get those three together, that tends to get air out a lot nicer than sitting and patting.

Steven Bruce
I suspect a lot of parents, and I'd be one of them, thinks it's actually quite nice when baby draws his knees up.

Mike Marinus
Absolutely, yeah, the problem is it makes it very difficult, because now you've got pressure sitting on to the stomach, and you've got pressure pushing it in. And what we want is the stomach to be as open as possible, simply because air generally ends up in the fundus of the stomach. And we need them to be able to stretch out to be able to burp it out.

Steven Bruce
Good. Yeah, that's nice and simple. It shall get my daughter to practice this.

Mike Marinus
So that works nice. The other thing that we're going to talk about now is for those dyschesic babies, now those are the babies that sit and push a lot of the time. Basic terms, what's happening with these babies is they've mixed up what to push with. They crunch with their tummy muscles and their diaphragm and they pull their bum closed. So they'll lay down this way, and they'll pull their legs up like this. And they'll be really, really tightly packed. The problem with this is that, and we know from some very strange research that I think is out of Sweden, that even 1/3 of adults can't pass a stool lying down. So lying down is a really difficult position to do this.

Steven Bruce
That would be interesting research, I don't know many adults who would even try.

Mike Marinus
They used a fake stool, whatever that is, inserted the fake stool, and put these poor people in different positions. So they put them in squats, standing up, lying down and it turned out down lying down is the hardest position to pass stool.

Steven Bruce
Don't try this at home.

Mike Marinus
Yeah, this comes with a disclaimer. Okay, so what we're gonna do here to be able to help with that, we're gonna go to this one over here. Now I want to teach baby to be able to push with the tummy but open your bum because the mix up is they're crunching the tummy and pulling the bum closed, the giveaways when they lie down, and mums and dads will know because the monitor starts to go. It's this buildup of this push. And so what we do to be able to help them, this works nicely before you feed, we go thumbs up, thumbs behind the knees, bum flat, knees out to the sides and here's the trick, I'm going to roll into a squat, but I'm not putting any force onto the baby. What I'm doing is coming up only to the point that I feel Travis' stomach muscles pushing against my fingernails, because I'm holding him in the position that he can't get into because I'm facilitating. So I'm just to that point. And I'm allowing him to push against me. So I allow him to push me for three seconds. And then I reset him all the way down to the bottom, come up again three seconds and all the way down. We do that three times. The second one, instead of a bicycle like that, is we're going to do a little frying pan which looks like this, which is a little wiggle, which generally, the heads are a little tighter, we don't get this whole wobble up here and the wobbles just down there. But that works really really nicely for 10 seconds. And then we want to follow the colon around. So we come up five, across five, and down five swipes, only as hard as you would put pressure on your eyeball. The idea of doing all of this is that if we can do it before they feed, because when they feed, they have a gastro colic reflex and they eat and they want to push everything out of the tummy. And that's when they kick this in. So if we can do this before they eat, it means that when they get a feeding, the feeding will be a lot more relaxed. After feeding, the best thing you can do, and this really is a little pot of gold, doing this, is hold them here, fingers underneath the knees, get them into that nice open position. And then we use what we call the transport reflex. So we know that we calm babies down if we move with them. So we get to this open position, just like we had down there. But now we go for a walk around the house, that position, in that and then going into winding works like a button because then we can get as much of the gas out. And all we're doing with all of this, I'm not saying the gas causes the problem, I'm saying I'm reducing friction. And the less friction within the baby, the more they're going to be able to do the crying and they're feeding and they're sleeping.

Steven Bruce
They're happy doing this, they're not skin to skin, they're facing away. We're not worried about those things at this second.

Mike Marinus
No, because we're close enough. And yeah, and also, skin to skin tends to work a little bit better belly to belly, as well. But also this one is where I want them to be as calm as possible. And if they start with their pushing in just that position, it's really amazing. Just getting into that position just allows them just to drop, and it takes all that pressure away. And then what that allows for, which actually is a great point, is to get them skin to skin with you. And then what you can do from all of your burping and everything, this is wonderful to be able to put them down, holding them belly to belly with you like this, you can get yourself reclined into a chair. So there's an easier passage to allow all of milk to move down. Then when you pop them down, you pop them down onto their bum first, then the head second. And we've got that heated situation we talked about. That is a setup for success to be able to get a baby to relax.

Steven Bruce
Good stuff. Do you want to stay here or can I... I left my questions behind, let's go back. Amber says, is there any strength in a suggestion that by continuing to do sporting activity through mid to late pregnancy, there could be some problems caused with birth, e.g. delayed or prolonged and unsettled babies.

Mike Marinus
There's nothing that I've read about unsettled babies. I don't know about the research out there about birth issues around that. One thing I can tell you is I've got a friend of mine who is a CrossFit nut, and has the strongest abs I've ever seen. And she was told to slow down because her baby actually had no space to grow. That's the only thing that I've come across. But really I've, again, it's like you were saying if you do triathlons, if you do things, go and do your things, do the things that your body is used to do.

Steven Bruce
I think, I forget what it was, we had a discussion a few weeks ago when I think that same point came up, say if you're supremely, superbly fit, then it can affect the length of pregnancy.

Mike Marinus
Don't take up rock climbing.

Steven Bruce
You mentioned at the beginning, and I'm intrigued by this, the business of stillbirths, of sudden infant death syndrome. Did anything come out of the research that you were doing? Can you enlighten us, can you give us any hints or thoughts on how to minimise the risk?

Mike Marinus
Yeah. It's really, really interesting because it's all about messaging. At the end of the day, it's a very, very nuanced situation. And when you do public messaging to the levels that the countries have to do their public messaging, you kind of start understanding why they say well, I can't give out a nuanced message, I just have to give out the message of sleep on your back. Now we know that sleeping supine leads to all sorts of plagiocephaly issues. We know reflex babies hate to do it. Also find me another monkey that lies down sleeping on its back. But what that brings us to is a risk and reward because sleeping in a prone position or sleeping in another position. Yes, it has benefits to it. But it does come with a certain amount of risk. So it really depends who you were talking to because, and I'll give you a wonderful example of

side sleeping. The only issue with side sleeping is that if the parent puts them down incorrectly, they may roll onto their tummy, the position of side steeping, according to the literature that I've read, and I put my hands up, there may be new stuff, I don't think there is. But the actual being put in the position on the side, there is no problem with. It's all about the fact that we can't message that to everyone on one big banner. Back sleep works when you message like that. However, there are a myriad of different things. If you are formula fed, your risk goes up, if you are not in your parents room, your risk goes up. If you are on the same surface, your risk goes up if you do the wrong things. So here's the other thing, is just starting to say to people, well, you can co-sleep because we know that it's biologically appropriate to do. However, there are other things in our environment we do that aren't biologically appropriate, like we smoke, we drink. So I had a patient who, that was about two years ago, came in devastated that she had rolled a bit onto her baby while she was sleeping. And she said you know the thing is, I wasn't drunk. I'd had two sips of wine and this is the issue, is you don't have to be full down drunk. When you're sleeping together and you are working off that connection of mother and baby, you cannot have your senses dampened because it will go away. So you can't be on medication to calm yourself, and there are so many things that you have to do right. If a mom has long hair, she needs to tie it up, you can't have pets in the rooms, other siblings can't be there. The bed can't be against the wall, there are so many things. And what's really interesting is a new paper that's just come out now, 2022, from an author called Moon who really, really does a lot of work around SIDS. For the first time they've started to actually publish what those things are that you should do. In the beginning of the paper, they say, look, we don't endorse this, however, if you were to find yourself in this position, these are the things that you might consider doing and then they start giving the list. So it's very nuanced. And it's not just, it's fine to do it. You have to know what you're doing because it could be a problematic situation if you don't.

Steven Bruce
Lucy says this is really helpful advice. Thank you. An early thank you, I know we're not quite at the end of the show. I would like to raise the issue of the Advertising Standards Authority and the Committee on Advertising Practice, the body that actually sets the rules for advertising. How do you get the word out?

Mike Marinus
It's very difficult, because also, coming from South Africa, where we're in a bit of a more of a grey area where we could say, basically you could say, a lot of what you liked. The ASA is tricky, because we have no hold there, it's not us who give them the standard that they want. It's them that are in the position to choose the standard of evidence that they deem is fit. So, you know, the one thing that I hold on to hope with is if I look at PubMed stats, and I look at the amount of research that is going into paediatrics at the moment. And even if I look at, I had a trip now, where I went to Sydney to go speak at the kids summits and I think we raised $60,000, for chiropractic paediatric research. That's the idea, is to start to get it to that level, because we can't change it. It's what they've said. We can be upset about it. You have to be careful about what you say, as we've seen with the systematic reviews, but the thing is, if we have to be careful, everyone has to be careful, or should have to be careful about what they say.

Steven Bruce
However, in this sense, it's only chiropractors and osteopaths who have to advertise because otherwise you'll go to the NHS and you'll be told to go and see someone who's not advertising. It's only advertising that they care about. I've got a set of words from the Advertising Standards Agency on what chiropractors

and osteopaths are allowed to say, which Justin's brought up. And it's very interesting because we are allowed to refer to treating specific population groups. So we can say we can treat babies, we're just not allowed to say what we can treat in babies. So we certainly can't say colic, but we can say that we can treat babies and children which is useful to know. But both of our groups, osteopaths and chiropractors, you know, and this is exactly the same wording. But both of us have a list of conditions that we're allowed to say we treat. And the ASA says that, beyond that, we probably shouldn't, we'd have to have robust evidence to justify anything that's not on that list. It is longer than what physiotherapist have, which is curious.

Mike Marinus
It is. It pushes me in an interesting direction, because I want to get away from that word, because I don't like it.

Steven Bruce
Which?

Mike Marinus
Colic. I want to get into the specific of what I'm helping with.

Steven Bruce
This is only an example of what you can't say you can treat. Essentially, they're saying unless you've got evidence for that specific problem condition you can't say it.

Mike Marinus
And that's where in the longer game, I would like it to move to, in terms of having the research actually bear down and look at those specifics. We're starting to get into sub grouping. And then to actually subgroup and go right, what did we do for this? But then again, are we going to mix up the profession and the tool that we use? You know, am I gonna say, it's an adjustment, or it's a chiropractic session that I've had, and those two are very difficult as well. You know, that's why the real world data is fascinating, because then you have a parent that goes well, I had the full experience. And this was my takeaway.

Steven Bruce
My advice to people with regards to the ASA and their authority, the CAP, is that, as I said, there is a list of things that we're allowed to say we can treat, and they say you've got to have evidence for anything else. Provided you've got what you believe to be robust evidence, I would say to anybody, stick it on your website, because the worst thing they can do is tell you to take it down. If you don't take it down, they can then accuse you of unprofessional behaviour. And that could be a complaint to the General Counsel. But let's say you've got a paper and they don't agree that the paper is strong enough to merit what you've said, then they'll tell you to take it down. They've specifically said you can't use the word colic here, but again, this is me being perhaps a little bit more forceful than many people.

Mike Marinus
Working our way around the situation.

Steven Bruce
Working our way around it. I do think that maybe there is a place here for a pragmatic trial where we don't say, you're going to treat babies with this particular subdivision of colics, here's a baby with a problem, you lot, see what happens. And then after a period of time, we see how many babies came out of their chiropractic, osteopathic treatment or whatever the alternatives are. And were better and use that pragmatic trial rather than try to nail down what the condition was, because it's a bit like, those trials where you see what we practice manipulating the OA joints to see if that fixes, well, we don't just put manipulate one joint, we do lots of things. And I suspect that, you know, you do the things you've demonstrated here when you treat babies or advise their parents, but you probably do other stuff as well. You know, all sorts of things to help with those babies.

Mike Marinus
Absolutely. That's the whole point, is to be able to give this sort of whole person care as much as you can. Yeah.

Steven Bruce
Someone called C says, when co sleeping, why shouldn't a bed be against a wall?

Mike Marinus
Because of risk of the baby getting wedged. It's all about wedging.

Steven Bruce
And somebody says, for Steven, for non-regulated professions, you might be able to say what you like, but I have a feeling it's different for osteopaths and chiropractors, because the General Council might go for us. Just think you need to be careful when you advise people to do and that's signed CX. So that's come from my wife, who keeps me on track a lot of the time and in check.

Mike Marinus
We have a lot in common.

Steven Bruce
I still stand by what I say, you know, when you are advertising, it's the ASA and the CAP, who dictate what we're allowed to say, and they dictate what grounds you must have to say something different. And if your advertising is wrong, the first port of call for a complainant has to be to the ASA. And it's only if you disobey the ASA, that they should then go to the General Council for a complaint. I'm going to France tomorrow to see my wife and I suspect we will have a long conversation about this. She'll tell me what I think.

Mike Marinus
You've done it now.

Steven Bruce
Dominic says, does my fantastic guest speaker Mike offer any courses? Do you?

Mike Marinus
Yes. Yeah, yeah. So I'm actually going to be, I'm in France in November teaching and yeah, we'll be teaching out here. I've got some some online stuff that's coming out now on my online platforms. And yeah.

Steven Bruce
One here, you may well be aware of is, Felicity says, there's recently been an osteopathic Cuties Trial for colic results, and it'll be published soon.

Mike Marinus
Yes, yes. I'm looking so, so forward to that coming out. I do a podcast with an Australian friend of mine, we've been looking at this, we're about to do an episode on it. It looks huge. It looks like they've put a lot of time into this, a lot of effort into it and it looks like it's gonna come out really nicely. I'm glad you look into that Felicity, great.

Steven Bruce
I think it's absolutely wonderful, gets to me is that calling it Cuties. I don't know, people spent too long trying to find appropriate acronyms.

Mike Marinus
Working a little bit in academia now and teaching a little bit on this course at the moment, this is academics, it's what they do.

Steven Bruce
They're doing it, that's the main thing.

Mike Marinus
They've got the EAT trial for solid foods, you know, they'll do anything.

Steven Bruce
A third of the trial spent trying to work out what the acronym is. Pip says, I always say that I have a look to see what strain patterns are present from birth, etc., that may be contributing to whatever condition they present with, I never say I can treat those conditions as they're often multifactorial anyway. And biomechanics is just one component, which I'm sure you're going to agree with. But also, of course, we can say what we like to the patient or the parent of the patient. We just can't advertise a lot of things. So if a person comes in and you say you believe you can treat colic, that's okay, that's not advertising. That's you advising a patient. Well, if it all goes horribly wrong, and something really nasty happens to the baby, the patient, then there might be a potential for a complaint somewhere else. I'm guessing that doesn't very often happen.

Mike Marinus
Yeah. And I think, you know, you got to manage expectation all over the place as well. And when you're working with the patients, and the parents, I try and stay away from, actually like that first one with the strain patterns because I generally stay away from saying, you know, we'll treat this thing. I tell them what to look out for. I tell them what's normal that should happen. And I tell them what we're going to do to move towards that.

Steven Bruce
If I were advising someone as I am wont to do without any great expertise in paediatrics, and I wouldn't suggest you say, yeah, I can treat colic to the patient, I'd say well, a lot of people would call what's happening here colic, I'll look and see what I can find, the strain patterns, whatever. And let's see what happens. I have success in doing this with other babies.

Mike Marinus
That's the thing. It's taking that evidence base, that proper old Sackett evidence-based approach of going a third of it, here's the empirical evidence, the evidence is, whatever the evidence is, here's my expertise. I've been doing this for 17 years, I'll tell you what, I generally see this is a child that is maybe going to take us a bit longer this, I'm very happy that we should be able to come right and then the last part going, are you okay with this? As the family, are you happy to put in your work because without that, you know, we might not come to the resolution.

Steven Bruce
Okay. The Cuties trial, going back to that, raises problems in my mind, because, you know, I'm fond of telling people that osteopathy doesn't fix people. Chiropractic doesn't fix people. It's what those practitioners do with their hands that fixes people. And it could be the same, it could be different, it could be what physiotherapists do or anybody else does. It could be completely standalone, purely something that only chiropractors do. When that Cuties trial comes out, let's assume for the moment that it's positive, and it says that we have a statistically significant beneficial effect on babies with whatever the target condition is. Will that still be able to be applied to chiropractic technique? Are the techniques suitably similar?

Mike Marinus
Yes, yes. When it comes to paediatrics, a lot of the teachings that I've undergone, when I then looked into osteopathic text, a lot of it sits there as well. So there's a lot of interplay between the two, when it comes to that, because, again, it's very soft technique. And there's not many ways you're going to do that. And there's not many ways that the tissue and the fascia is going to work together.

Steven Bruce
Actually, thinking this to myself, if I were a chiropractor, and it's an osteopathic study, I'd say, well I read the study, they're doing what I do, and the study was significant.

Mike Marinus
That's the way to think, is to break that RCT down and go, is the patient that I have in the population here or would they have been kicked out? You know, on problem number two.

Steven Bruce
Do you know, the publication date for that study?

Mike Marinus
No, it's still a little bit because I got really excited about it. And then I found Chris, who I met, I said, have you heard about this, and he was like, slow down. It's only coming up in a little while. So I think it's still a couple of months.

Steven Bruce
I was astonished and appalled when I was talking to someone else on the show to find out how long it actually takes to get a study published in a peer reviewed paper or journal.

Mike Marinus
And all the talking happens, and then they stop. And you go, oh, and so by the time it comes out and it says the date 2022 on it, has a 2017 draft, it's taken forever to get through.

Steven Bruce
Claire wants to know what that podcast you mentioned is called.

Mike Marinus
So I'm a junkie of making podcasts, that podcast with Christian is called Two Ped Chiros.

Steven Bruce
If you let me know what it is, I'm putting that onto my email, and similarly with courses.

Mike Marinus
Then we'll put all of that stuff out there.

Steven Bruce
Because Kat here has said, where will you be teaching in France? Because she's an osteo in France, and she's desperate for good CPD. What do you mean, you're desperate for good CPD, this is good, CPD, Kat. So where are you teaching in France?

Mike Marinus
It's been set up by the wonderful French Chiropractic Association. So it is somewhere about an hour's south of Paris, is all that I know.

Steven Bruce
Right. Emily says, treating babies with cranio sacral therapy, how many sessions do you tell the parents is usual, I know people want magic within one session. But realistically, what do you think?

Mike Marinus
So my problem with anything like that is, if I can fix it in one session, it means it can revert in one session. So I don't like that. It's going to take us time. Generally, if we look at our upset babies, four treatments is,

my stock standard is twice a week for two weeks. That gives me a little bit of time to know what I'm working with, with the parents, with the child, how are they responsive, because also, I may have a situation where I have a child who's a very high responder, and I can't do a lot. I work on a sphenoid. And all of a sudden, they get really, really hyper. And we'd like to work with those little blood pressure monitors and stuff as well. So you can tell how they're doing and tell what resilience they have. And at the end of the day, everyone's slightly different. I say I want four treatments with you just to see what's going to go on. And then I want change within those first four, because if I don't have change, then I got to look somewhere else. But one of my areas, I'm looking for change. And with cranial it's about the same. It's about the same, but I mean, it's not unheard of to see eight or nine, but for me that's still fixing a problem. It's not about, just keep coming in every week until... It's not that, it's about getting the problem sorted and then we can move on. But that's what I would say, somewhere between four and six.

Steven Bruce
Yeah. Okay. Somebody says here that, Steven, I can't remember who recommended Mike. But could I say a public thank you to them, because it was one viewer and another paediatric chiro. So yeah, I mean, I suspect that most people are very glad that we got you on the show. That's the sort of thing I should save till the end. But it's just popped up at the top of my question list here. This piece is out of interest. Do we know when the four smell centers dissolve into one?

Mike Marinus
It's when you get that big cull. So generally, somewhere between six and eight months is where you get that big neurological cull, that starts to happen. And that's when all your potential moves away. So basically, whatever you've wired, so the nerves that fire together will wire together. And then we get to the point that there needs to be that big cut off, there needs to be that pruning because you can't run all of those. So we go from being generalists as babies to then becoming quite specific.

Steven Bruce
Okay. And what I've got here, I've got somebody who the system is calling Guest 4872. There's a reason, 4872 rings a bell for some reason here, wasn't Jean Valjean's number, was it. What do you say to parents with regards the age of weaning, I had a mum say today that she was looking to wean around three, three and a half months after her health visitor, told her it was okay for a hungry baby. I just sussed the current research indicates six months, but how do you explain all that to patients?

Mike Marinus
Okay, so there's a new piece of research that I think is doing the rounds, and they're talking about three months at the moment. So here's the problem with that, you need to have three things working, when you're going to wean. Number one, the child has to be able to have a flat hand grasp of the food, bring it toward their mouth, so they must have the fine motor to be able to grab it and find their midline. Second thing is they need to be able to be sitting up or seated for the duration of the feed. You can't feed a child that's hanging off the side. I'm not saying sitting sitting but sitting in a highchair or sitting wherever. And then the third thing...

Steven Bruce
Without the parent holding them.

Mike Marinus
Oh, exactly, yeah. So they must be able to sit in some sort of chair. And then the third one is that that suck reflex has to have gone, because it's unsafe to put solids in a child's mouth when they go and they have to suck away. So that suck reflex has to go, so all three of those.

Steven Bruce
If the suck reflexes gone, that means that they can't breastfeed, surely.

Mike Marinus
No, no. So the suck reflex is a primitive reflex. So the idea being that it's only there until the brain can connect with the muscles involved, and it can run it from a higher centre. Okay, so that's just more an automatic that happens. So what I want is to be able to put the food in and they can play with it with their tongue, but they don't have to automatically swallow it back down.

Steven Bruce
When does that normally disappear?

Mike Marinus
So that will go at about three months. Sucking and rooting go really, really quickly. But they're really important in the beginning to be there. If those three are gone, the assumption is that their kidneys are ready and the assumption is that the gut has tightened up enough that now we can start throwing bigger proteins in, and the thing is between that four and six months is a golden opportunity to get the reactive proteins in. So the things like eggs and fish and all of those things that they could have problems with. So we don't want to get those in after because that becomes a little bit of an issue. But I know that there is a trial at the moment that is being spun all over the place where they're trying to give solids to three months old, and it's just not biologically appropriate.

Steven Bruce
Right. Okay. Interesting that, because some mothers will breastfeed their babies for a very, very long time. And presumably that can go on in addition to solid, semi solid food.

Mike Marinus
Well, the World Health Organisation suggest that you should exclusively breastfeed until six months.

Steven Bruce
Is that still their advice?

Mike Marinus
Yep, that's still their advice. And then you should carry that on for a minimum of two years. The problem is, every country in the world falls hopelessly short of that. But that's the advice.

Steven Bruce
Okay? Tracy says, how do you use probiotics?

Mike Marinus
So probiotics, Tracy, now you've stepped on a landmine because probiotics are really, really interesting. And with our little ones, we want to look at things like bifido bacteria, lactobacillus, because those are the commensals, those are the ones that are really going to work well to be able to, first of all teach the immune system, which is really important, second of all, be able to get the best out of all of the nutrition that's coming in. And also, they take the place that could be taken by the proteobacteria, the really bad bacteria. So those are the ones we want in. So those are the probiotics we want. However, the theory has been for a long time that we give probiotics, and that populates the gut. But what the research is saying now is that gut is populated, and it's already got people live in all those houses. You don't just send new people in and old people move out the houses, the houses are full of people. What they're assuming now is when we use probiotics with bifido and lacto, is that they are creating an anti-inflammatory effect. So they're having an extra anti-inflammatory effect which is calming, which settles the stomach, which does all those things. So that's really interesting because what we used to say was use five drops of probiotic once a day. But now that was under the populate the gut theory. But now the theory being that we want to have an anti-inflammatory effect, should it not be one drop now, one drop later, maybe three drops at five o'clock when we know it's gonna get bad. So the theory is starting to change. But probiotics, that's where, if you want to follow the money, that's where the money is at the moment in terms of research, is probiotics, and prebiotics.

Steven Bruce
We've got no objection to probiotics.

Mike Marinus
No, no, they're absolutely great.

Steven Bruce
You've got 30 seconds on this one. Oh, crikey. There's more questions coming in. Yeah, of course, Jean Valjean's number is 24601, not the one that we had there. Yes, and it was more about probiotics. My question, again, you got 30 seconds on this, I heard from someone who would be regarded as a reasonable expert recently, that modern formula is pretty much as good as breast milk.

Mike Marinus
So one of the things that breast milk does that formula can't do is it changes through the day, its makeup changes. So in the evenings, you will get the higher building blocks of melatonin into the breast milk. What breast milk also has is prebiotics, they have these human oligosaccharides, which feed the good bugs. And I know there's a whole lot of ideas of putting those into formulas at the moment. There is nothing really that beats breast milk, the other things come close. I think the thing is, it's always an alternative. It's never going to be the genuine article. It's great that we have it. Because for a lot of people, they really require that. However, I would put my head on a block and say no, it's not the genuine article.

Steven Bruce
And I guess for most people, the only reason to do it is because baby can't feed properly or won't feed properly. And maybe there are reasons that we could look at.

Mike Marinus
It's a nightmare. It's a nightmare. Feeding really is.

Steven Bruce
Well, we have still had a few more questions come in while we were speaking. But we are out of time now I'm afraid. Thank you for coming in from Southampton for the show. Let's hope that you can get a few of the viewers from tonight on some of these courses.

Mike Marinus
Absolutely.

Steven Bruce
It would be great to watch the recording.

Mike Marinus
It would be great to have that. And yeah, thanks for having me.

Steven Bruce
No, it's been my pleasure, really has. That's all for this evening. I sincerely hope that you found this useful, even if you don't treat babies yourself, because it's great to be able to inform parents of what's available to them, whether conventional medicine or otherwise. And I know it's all available on the APM app and elsewhere. But if you haven't downloaded that already, I just wanted to quickly look ahead to what's coming up in the next few broadcasts. Next Wednesday lunchtime, we have a case-based discussion for you, always valuable, these discussions are. So do be there if you can, then on Tuesday, the 18th I've got an evening broadcast with another chiropractor, there's a bit of a trend going on here I think, this time Simon Billings, who you'll know if you've been a fan of the shows, he's been on the show before. This time, we're going to be talking specifically about treating migraines. So set aside the evening of Tuesday, the 18th for that one. And I can't believe I'm doing this, I'm handing over to a guest presenter on Monday the 20th Because I've got Karen Grinter back in the studio to demonstrate some more Pilates based exercises, she was asked back to demonstrate the hog exercises she talked about in the last show she was on. But I've been called for jury duty. So my colleague Brooke will be hosting that. That's another lunchtime show. Like I said, there's much more scheduled and you can find it on the app, or you can find it under the CPD Calendar tab on our website. But as you know, I mean, we're committed to bringing you more than 70 hours of learning with others every year. So, we're constantly adding more to the programme to keep you up to date, and ready for anything. Speaking of being ready for anything, don't forget, we have another of our famous clinic first aid courses here in the studio on Sunday, the 20th of November. There are again details of that under the CPD tab on the website. And places are going fast as always, if you're in need of first aid training, or you just feel you need a top up or you just want today's entertainment, frankly, I'd suggest you book straightaway because the early booking discount expires on Friday. That's enough for now. So from me and from Mike and from all the team behind the scenes here at APM. Goodnight. Thank you very much.