Academy of PHYSICAL MEDICINE

Chaos and Complexity

with Simeon Niel Asher

26th May 2020

TRANSCRIPT

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Steven:

Simeon, welcome back to the forum.

Simeon:

Thank you very much thank you for having me.

Steven:

You've got something strange and exciting for us today I believe.

Simeon:

Something quixotic even.

Steven:

Okay. I believe this.

Simeon:

Okay. Well first of all this is the last of our eight and I just want to say thank you so much for all of your support, for all of your interest in the work. It's been absolute pleasure. And I thought we kind of wrap things up today, round things up with some, some stuff that I kind of got into a while ago, but no one seems to have really sort of run with it in osteopathy and for me it's ties a lot of thoughts together and perhaps even gives us some different directions on osteopathy and trigger points and the whole kind of reality of things.

Simeon:

So I thought we'd finished today. How do we start it a bit esoteric with the language of touch? I thought we'd wrap it up with something a bit different.

Simeon:

Yeah. Okay.

Simeon:

Yeah. So we're going to explore so sort of this, the ideas of chaos and complexity theory, vital self, and we're going to look at how that all applies to trigger points and, and perhaps clinical importance of that as well. So, so I thought we'd start with the first slide. So first of all, as I understand osteopathy and, and I think you know, I went to a very mechanical osteopathic college that was called, now that UCOM, I think university whatever it was, it used to be called the BSO. And we were quite structural college and over time I've certainly come to appreciate, certainly the autonomic nervous system and then some of the more subtle things that are going on in our work.

Simeon:

And I thought I'd start with this quote from Andrew Taylor Still because he is after all the founder. And one of the things that he encouraged his students to do was to look at science and the human mechanisms for health and to look at the truth underneath. And I think what I'd like to explore today is some really fundamental truths in systems theory. And if we look at the, the sort of main

tenets of osteopathy, this is the idea that the body is capable of self-regulation. Suddenly, when I first found out about osteopathy, that was the thing that really caught my attention. It's the thing that sort of lit me - was the idea that the body can heal itself if we give it the correct or optimal circumstances. Of course, not always, we have to accept that there are certain genetic factors, but on the whole body is a unit, and the idea that the body has self-regulatory, functions that want to get better, if you break a bone and it fixes itself.

Simeon:

What is the surgeon compared to the healing of the body after the surgery? The, the idea that there's this kind of innate inner healing. And that's something exciting and I think it's something that needs exploring or can be explored in a, in a more sort of a different paradigm. So, so let's go to the next slide. So I think it was that, was that the next one? Perfect. So I think that the idea of self-correcting mechanisms really started from is a quote from Aristotle. It's not straight, it's not completely accurate, but it's in essence it's accurate, which is the whole is greater than the sum of the parts. And of course we've heard that said many times, but there is this there is this interplay between sort of holism, reductionism, this interplay between sort of taking everything and breaking it down to its systems.

Simeon:

Certainly we see that as has become more complex. There's certainly been more specialization within it. I mean, I can't talk, I'm a specialist of shoulders with osteopathy, but I still think I bring the osteopathic principles to that which are and I know you've got chiropractors and physios here as well, but for me, the osteopathic principles are that we're treating the whole person. I'm sure you agree with that. The thing that someone comes in with is the kind of sanitized still point for sometimes other things and the whole, the body is greater than the sum of its parts. This of course has formed the basis of other scientific thoughts, scientific revolution, you know, because cell therapy, which is a type of psychotherapy is based completely on that. And then the ideas of vitalism and holism and the idea that there's a kind of vitals itself, vitality that emerges from the complexity of self.

Simeon:

And that that is me. I am the emergent property of the complexity of my cellular structure and everything put together. Also we're going to look at some ideas of my homeostasis and Anastasis, this idea of a sort of internal balance. And again, very much part of osteopathy, the idea that you know, this is something that of course was taught so many of us, the idea that the body, the whole is greater than the sum of the parts. You know, the foot is greater than the navicular and the cuneiform for metatarsals. But there's, there's something about putting this stuff together, the structure and the function, the structure and the function, which is greater than the sum of the parts.

Steven:

Okay. So hang on, hang on. You can't get away. We're going on without talking about Mandelbrot set fractals.

Simeon:

Oh no, we're coming. We're coming back to the last time. I wouldn't, I wouldn't do that to you. So actually I'm not joking when I said that this got me into a, this got, this was a book from my great

uncle, the book of life. I'm glad to see that by the way. It's worth quite a lot of money on eBay. I did check and this was this was the really the Bible for many years of, of naturopaths. The idea of the vital self and vitality is the, like I said it's a tenet it is the central principle of naturopathic medicine. So it's the idea that the body, that the vital energy is somehow greater beyond the physical self. It's again in other cultures and other mindsets.

Simeon:

It can be called the chi, the key, the prana, the force, the life force. It's this idea that there's some animation that goes on, which is sort of a product an emergent product of the structure itself. And it's very much to do with the holism that of course we talk about the balance of spiritual, physical, psychological as well. And that's all wrapped up in the same idea. And of course the environment that someone's in all of these phenotype, genotype, everything has a role to play. But certainly what vitalism and the vitality or the vital forces, this, this intelligent animation within every person. And this is a concept which is very familiar to osteopathy. I'm sure it's something that not new that I'm talking to you about. So, so where does that come from it and how has all this kind of thing together?

Simeon:

So, let's go back to the eighties. So in fact we're going to start with the 1880s and then we're going to go to the 1980s. So yeah, point Kerry started this, this very interesting theoretical mathematics, looking at what's called what he called non periodic orbits. And this was, it started off by looking at the, the planets, the way planets orchestrate around one another. And there was like a nonlinear dynamics. And it's all quite complex. So it really wasn't until much later on when the computers became sophisticated enough that we started to explore some of these things. Now, chaos theory was a book, you know, James Glitz, chaos was, it was, it was a big book that really said a lot of stuff I said really was that, that there's, there, there's, there's a underlying chaotic principle that life property has properties of life.

Simeon:

But actually what came after that is much more relevant to us, which is something called complexity. Now chaos is not random. Okay? So randomness is, is something different. Chaos has mathematical, underlying principles. So like I said here, one, one way of looking at it is if you're standing on the 30th floor of the Citibank and you're looking down and you're seeing this kind of life going on underneath, and you can see the cars and the taxis and the buses and the people and the restaurants, and everything's humming and buzzing, and you look at it and it looks like chaos. It looks like there's, there's no order. But of course everyone has their vector, that every person is going into a certain place. Every vendor is selling a certain thing, and there's a kind of inherent it's certainly not random.

Simeon:

It's actually highly ordered except that it is chaotic. So, so there's applying this kind of thinking to systems theory has really started a whole different branch of math because there's something about this mathematical predictability within this. If we could plot all the vectors where everyone was going, then we would have, we would have certainly a mathematical model, but of course chaos what looks like chaos and complexity of very much close to each other. And complexity is an emergent property that comes out of chaos. In the 1980s, the chaos theory came out the eighties to

explain nonlinear systems like the weather. So there was this idea of a butterfly effect. The butterfly would flap it's wings in Brazil and it would change the weather in that, you know, in Siberia. So the idea of this interrelated interconnectedness, came from chaos theory.

Simeon:

So, so that was quite interesting. I mean, the whole idea of this very simple rules having extremely diverse, intricate, complex behaviour. And, and that really brings us to the heart of where this is going, which is that actually complex systems have very simple rules and we're going to look at those rules together. So this is a fractile here or a fractile. And of course, many of you know about fractiles, they're, they're sort of points that are repeated. And, and of course, when you look at a fractile, which is a mathematical model, we can see all sorts of things within it. We can see that there's a branching of the lung structure is a fractile. You look at the leaf structure, it's a fractile that's self-reproduction on a micro macro scale. Because if you come and zoom into that fractile, each part of it is exactly the same as the whole.

Simeon:

There's this holographic kind of content to it. So, so the, so the idea is that chaos produces highly ordered events from very simple principles and very simple rules. So I'm going to get slightly into complexity in a second, but, but that's where chaos is. So let's go to the next slide if we can. I think it's the weather. So yeah, this is play, this one for me. And I want you to look at that. This is true, complex, true chaos yet, so, so slow. So chaos theory at work here. So I'm going to look at the clouds and of course, if you could track each water molecule and no inspector, you would have a highly predictable model, but as it is, whether it's, it's extremely unpredictable when is it paused where you are?

Steven:

Yeah.

Simeon:

Yeah. So the idea here is the weather itself has actually made of very simple things. It's made of droplets of water, but of course the pressure, the density, the temperature, the variation, slight variations over time have incredibly complex algorithm outcomes. So there's an infinite amount of data really that's going on in the weather, which is why it's highly unpredictable. But actually it's made up of very simple things. It's made up of water, molecules of wind. And so the idea here is that there's a complexity that comes out of chaos. So some of the questions, so moving on to complexity now. So chaos was, was how things started. Complexity says like this, it says that a molecule of water has different, what we call it, emergent properties to a drop of water, which has different emergent properties to a puddle, to a Lake and to a sea.

Simeon:

And even though you have the same molecule repeated many times, as you increase the level of complexity, you change the emergent property. That's really fundamental to what complexity theory says, and we will explore it now. So, some of the questions that complexity asks are things like how did these amino acids get together to form molecules? You know there's a lot of questions around how life actually started and some of these complexities I'm going to explore with you. Explain some of that or certainly model some of that. Why did cells get together? Why did they get together

to form more complex organisms, jellyfish, seaweeds, sponges, and eventually into humans. What, what's this sort of idea of something becoming more complex and rather than, you know, the second law of thermodynamics that says everything should becoming less complex.

Simeon:

And then again, even on a societal level, why is it, there's these organizations that starts happening to families and tribes and communities and nations and wherever we look at complex systems, there seems to be these patterns that emerge, this emergent property of complexity. Mind for example, mind is the emergent property of the neurons of each one of us that, emerged from that complexity together. You know, I was reading a got quite into sort of neurology for a while and I was reading some that Phantoms in the brain and the brain, the mind that changes itself. And there's a lot of stuff about the idea that you can lose two thirds of your neural tissue and yet the mind can still be there. So there's this emergent property yourself, again, you know, ho what is it that is driving everything to complexity as opposed to the second law of thermodynamics that says everything should be moving towards entropy, towards chaos and where does complexity really exist?

Simeon:

So let's have a look. The next slide. So complexity exists at the edge of chaos. Sometimes I think of it like this. If you imagine oil and water together, there's a thin layer in which exciting things are going to happen. And it's the same with complexity. You need a very defined set of principled criteria and then you can, you can play with them and complex things emerge from that. So the idea with osteopathy of course, is that the whole is greater than the sum of the parts. And there's an idea in complexity of emergence that the emergent property is greater than the sum of the parts. So again, there's this kind of resonance certainly with holism and with vitality, and with osteopathy. So the edge of chaos really is a really known mathematical term. And that the thing about the edge of chaos and complexity is that it allows for dynamism and it allows for dynamic change.

Simeon:

And the thing about life is that life allows for dynamic change. As soon as something becomes static, it's dead. So there's a need to allow dynamism within a system for it to actually survive. And this is a really fundamental property of complexity and of course, of life itself. So, complexity is trying to answer some of these fundamental questions and at the moment it will sound a little bit airy fairy, but I'm going to get right into the nub of it very shortly. And the other thing is that it is deterministic, as we said before. It's grounded in real measurable maths, calculus, theorems and proofs. So this is not nebulous. This is actual math and it's the mass of complexity. Much, like I said before, when someone's looking down on the street and they're always vectors, complexity has its own mathematical beauty and, and it's only been really in the presence of these very powerful machines, computers that we've been able to really see some of these models.

Simeon:

And I'm looking at them mathematically. So actually I would suggest that complexity should be taught very much as a core subject in the early osteopathic colleges in our thinking because I think it has a real part to play in certainly in trigger point story, but also in of course, the body is made of many complex systems. The eye is a complex system, the urogenital system, all the systems are complex. So they all have a level of complexity about them and they will have a mathematical sort of deterministic mathematical algorithm behind them. And the other thing is that complexity isn't just

about in fact, there are very few people that have applied it to the body. Mainly it's been applied to things like, is pan-disciplinary in terms of like economics, anthropology, history. So I'm going to just give you an example.

Simeon:

So complex systems theory has been applied to a lot or a whole range of things. And I'm going to explain it now like this. If we take for example the horse and the cart, okay, so we've got a horse and a cart. So complexity there is that as this industry started to develop, the horse became the kind of centre of it, the attractor we're going to look at what attracts is are shortly. And around that there came people that made the leather and people that bought the leather made the seats and people that made the hooves and people that put the hooves on and these other industries started to swirl around the horse. And then people that made the cart and people that made the wheels for the cart. And all of these things started happening. And then of course along came the motor industry and another whole set of dynamic principles started.

Simeon:

And the petrol became a strange attractor. And we'll talk about strange attractors in a second. And then a whole lot of other industries came about that petrochemical plastics. So that at each point of complexity, there's a strange attractor in the middle that allows the complexity. It's almost like a catalyst, not a catalyst, but it kind of is within. So, this can happen with an economic theory. And of course within history we can see there are certain strange attractors within history. Some, I won't get into the sort of depth of it, but it's just such an interesting idea. So let's go now a little bit further.

Simeon:

But it's just a bit of fractiles in that that is just the most incredible thing that is pure. That complexity theory, very simple pattern is just repeated endlessly. So, some of the ideas of complexity are the idea of an attractor within certain, complex systems. So we're going to look at what are attractors. The second one is this idea of positive and negative feedback. But usually positive feedback, positive feedback is something quite dangerous for the human body. Negative feedback it likes negative feedback, something gets to a certain point, dehydration feedback drink. But positive feedback, sort of like luteinizing hormone that's a little bit more complex for the body to, deal with. The whole triggering of the egg and all that stuff. So also what's really important is this concept of this idea that the emergent property as you become more complex is greater than the sum of its parts.

Simeon:

And then this idea of the edge of chaos and self similarity, which we talked about as the fractiles before, this idea of this Goldilocks zone at the age of chaos where good things can happen, amazing things can happen.

Steven:

Simeon you've kind of stunned people into a certain amount of silence because of as you said, the esoteric nature of what we're talking about. However there've been a number of questions about whether by static you mean dead or still, or whether you mean stillness is static.

Simeon:

Yeah, yeah. Well just allow me to go on one more slide and I think we're going to, I just think to two more slides. I'll answer all of that, and the answer is yes, static is dead actually. Okay. So next slide if you would.

Simeon:

So, okay. So, as we said before, it's really been the advent of these complex computers that have allowed us to model things. And as we've taken more complex systems, we've started to model much more complicated as the technology has got better as the memory and the power has got better, a lot more sort of complex things have been analysed. And what we've found is that there were certain principles that actually exist in every single complex system. Every complex system shares very similar fundamental simple properties. And the results have had been absolutely incredible on stock markets, on social networks, all sorts of things. But, but no one has really applied it to the musculoskeletal system. And I think that actually is where I'm going with this as a trigger points are the strange attractors within the complexity of the musculoskeletal system.

Simeon:

The myofascial system. Okay, bear with me a little longer. It's all going to make sense very shortly, promise. Okay, so let's make sense of it now. So this is a guy called Steven Wolf who at the age of 12, wrote his own dictionary of physics. So he's a very super bright guy. I actually looked him up before this lecture. He's gone on to do incredible things, he got a Nobel prize. He, was the first one to, really drill down and come up with models for this. And he got his Nobel prize for this. And what he found was that there he, developed a very simple computer algorithm and he looked at something called cellular automata. And these cellular automata were dots on a screen for want of a better word, but you can think of it like food or, you remember those Tomagaches, those little things you had to feed.

Simeon:

As you can think of anything like that, that you would apply these automata, you would give them certain a bit more food, a bit more sunlight. A bit more water, you'd give them certain variables and then you would see what would happen to them if you put them all together under certain variables. So they set it up, automata where we're given certain stimuli and then they were modelled and he saw happens to them, what happens if you put, for example, sunlight and different nutrition and let's see what happens to these automata. And what he found was absolutely mind blowing. He found that there are certain emergent organizational properties that come out of this random chaotic automata. If under certain circumstances they will organize themselves. And there are three things that happen.

Simeon:

There are things called attractors that start to emerge from this chaos or complexity in fact. And there are three types of attractor. There's what's called a point attractor. There's a periodic attractor and there's a strange attractor. And strange attractors are absolutely what we're looking for. They are life. A point attractor. This is how is was explained to me is that that you have a bowl and a marble and you roll the marble and of course it goes to the bottom of the bowl. And that's a point attractor - that it's just attracted to the bottom of the body. It sits there and yeah, that's dead, that's doing

nothing. A periodic attractor is a kind of you know, that infinity sign. This is this periodic attractor where it's caught between two poles. So some of these cellular automata would do this.

Simeon:

And that is what's called a periodic attracts. And now we actually see that in nature everywhere. For example, binary stars are periodic attractors. So this principle doesn't just work on the principle of stock exchanges. This goes on throughout the universe. This is a universal principle. Can we see, especially in the cosmos. We see a lot of this stuff happening. So and then the third one is the strange attractor. And it was amazing when you read his work. The way he put it was, as you said, I sat down and I watched this thing bubble into life. I couldn't believe what I was looking at. Life emerged from the computer screen. These tiny little dots, automata, were given certain stimuli and all of a sudden bang, they just came to life. And so we're going to have a look at those things now.

Simeon:

So his genius was to recognize there were three things. So let's look at these classes. So in terms of cellular automata, which are relevant artwork to show you why the class one attractor led to stagnation, like as I said, like rolling a marble in a bowl where the cells or cellular cells really start whizzing around and then they just coalesce into a clump. And that's the end of it. So that's what we could call a point attractor. And complex systems do have point attractors within them. And the point here is that all complex systems have these happening, guaranteed. So if you're thinking of a complex system, this is all going on within it. Class two attractors have two different poles, like I said, so the cells would coalesce either over one or another or occasionally they'd flit off in between.

Simeon:

So this is a, how can I show you some of that in a second? And then only class three attractors produce lifelike results. These rules of complex systems only work because of the emergence of attractants. There's a great book called complexity by Mitchell Waldrop, which if you're interested in, this is a mind blowing book, but basically complexity, life, is all about strange attractors and at these strange attractors again and again, all types of complex dynamic systems, strange attractors emerged. They have to emerge, they appear to arise spontaneously as an absolute necessity of the system itself. So the strange attractor will emerge under certain properties, which is the edge of chaos. This, this border, like you said, between the oil and the water and the seven properties, they will emerge always and they are the organizing principles around which complexity emerges. They need to be there.

Simeon:

That's what's really important about these class three attractors. They need to be there. They literally have to be there. They're always there and they are like the organization, the organizing principle around things are, so we said before about the horse and the cart, the horse will become the stranger tractor. All these industries would spin around it and then start to grow. And then along comes the automobile and then you've got all these other industries that becomes a strange attractor and people that made ashtrays, people made the lighters for the, you know, all these other industries start to whiz around. And of course from that petrochemicals came from that plastics came and Bakelite and all of these things came from that. And from that, so we have these strange attractors that start to appear and then they like the organization around which everything else seems to organize itself. Okay. So far it's getting better or it's getting really interesting. So, so this is why it applies to many systems and absolutely guarantee and I'll put his Nobel prize on it that the muscular skeletal system,

which is a very complex system as strange attractors. Let's carry on. So let's have a look at this one. So this was a guy called Lorenz and this is his attractors. This is a set. Oh, so yeah, this is a video. So this is a periodic attractor. This is what they look like.

Simeon:

So these are the vectors that he's looking at. This is a guy called Lorenz and he modelled cellular automata and he gave them certain. So we're looking now at a type two periodic contractor. This is his view. And look what happens. So when we give these automata certain principles, they start to do this. So this is what's called a periodic attractor. And so you have two that you can see here. You've got two distinct sort of periods. You've got two. It splits itself into two things. It's kind of a bit like butterfly wings, which stay there for a bit longer as he plays it. Look at this. Incredible. So this is, this is emergence out of chaos. This is under random principles, very basic principles apply. This is what happened under certain circumstances. And this is the periodic attractor. Quite beautiful. So class one - marble at the bottom of a bowl. Everything's dead. Class two - periodic attractors, which appear by the way in the heart and the cardiovascular system.

Steven:

Okay.

Simeon:

Periodic attractors occur during heartbeat as well, its called the butterfly effect. So let's move on now to the next slide if we can. Strange attractors. So,

Steven:

Okay,

Simeon:

Here we go. Life on our planet exists on a nice edge. Some have called it the Goldilocks zone. Had Earth's orbit been closer to the sun the water would vaporize and boil away. And life wouldn't have started had earth been further away like Mars, it would have been frozen and stagnant. Had the valence of hydrogen not allowed it to form a stable bond with oxygen we wouldn't be here. Again and again, in almost every system, this pattern emerges. On the one side of the boundary, there's chaos and nonlinear dimension and constant termoil, upheaval, change. And on the other side there's rigidity, structure and order and using computer models such as cellular automata. This principle has been explored and complexity. This is another cellular automata. This is a shape that has emerged from certain principles. This is called the Azawa attractor. And we've got the mathematics for the equation for it. So let's have a look here. So here we've got some strange attractors that work. So this is from YouTube if you want to go look up strange attractors, it's reading again, organizing principles, basically emergence. The emergent properties are greater than the sum of the parts. The

Simeon:

Something beautiful arises from something very basic and simple.

Simeon:

You know, I can see a rhino here, I can see a Snowdrop and all of these incredible just from very simple complexity called the emergent property of the complexity. So, okay, we can move to the next line. So, so where does this take us? Well let's bring it down to, to the human body. So a lot of this stuff was a course that I did many, many moons ago at Exeter University where a guy called Simon Mills, was one of the profs there. Amazing guy. And this kind of blew my mind. He looked at a range of attractors within the human body, and he published some articles on it. And the strange attractors and periodic attractors operate at various levels in different parts of the body all the time. For example, the heart has point, periodic and strange attractors that operate all the time.

Simeon:

Again, he looked at temperature regulation, blood pressure, blood sugar, all of these are principles of complexity. But let's take the heart because that was one of the things that was crazy. We're going to look at something called the inter beat interval. So that's the RR, that's the interbeat interval between each of the heartbeats. And what happens is if you take a population and you measure that interbeat interval and you plot it, you usually get 72 beats a minute. The heart resting mostly 72 beats a minute. It can be more, can be less, but that's around about average. But when you plot that interbeat interval, which is the absolute bit between each of the beats, it is pure complexity. It literally is a complex algorithm. Why is that? Because the heart has to adapt to thoughts of stress to coffee, to stimuli, to breathing.

Simeon:

To all the different things that are going on the, heart has to adapt and in order to adapt it has to display complexity. Now a heart that isn't adapting, if you think of a sinus rhythm, which is extremely ordered, that's someone going into cardiac arrest, arrhythmia, going into a pure rhythm. So actually the more structured and ordered a heartbeat is the closer to death someone is. When you plot the interbeat interval then you see there's chaos, the chaotic pattern within it, which as we said is mathematically predictable. You know that that heart is healthy. I just want you to think about that for one second because it's really heavy. So in order to adapt the heart has to display complex rhythms. The more highly ordered something is, the less adaptable the heart is to it. The more ordered it is, the unhealthy heart is unable to adapt to these constant stimuli that are put upon it.

Simeon:

Coffee and stress and thinking about, you know, doing your bank and Perona and all these things that are affecting the heartbeat. So actually we've internalized complexity within our system, within our organ systems in order for us to adapt. And that's the point. Adaptability and flexibility of the system is inherent within complex systems and that's what these strange and periodic attractors allow us to do. So chaos and adaptability is within the system an adaptable system is a healthy system and a non adaptable system. It is a dead system?

Steven:

Would you like three questions?

Simeon:

Very close. Should I just finish that slide?

Steven:

Sorry, I thought you had finished it.

Simeon:

Very close. In fact I might have finished it so I'm just going to finish it then. So let me just finish it just at the bottom. So, I was just going to say this is that the musculoskeletal system is a complex system. Okay. Therefore, by ipso facto, by its very nature, it has to have within it these different attractors, strange attractors, periodic attractors, and possibly point attractors. And I would argue, I would assert rather that that there are things called poly modal receptors that exist within the Myofascia. But okay, you ask your questions and now we'll go into that.

Steven:

Okay. So based on what you've explained to does, it doesn't matter who is the therapist using trigger points, can two therapists get completely different results from using the same trigger points on the same patient? If yes, why and why do we need, what do we need to do ourselves?

Simeon:

Okay. So so in into sort of into practitioner reliability in terms of palpation is perhaps it's like one of the weaknesses of trigger point research. I mean maybe that's what it's talking about. So there is a, there is a reliability. In fact, when they, there was a very big paper that was published recently about reliability and in point studies to actually feel the trigger point in the trapezius and actually there was a 78% correlation between the therapist that they all felt the same thing and it was significant. However, they all been at it for more than 10 years. So I think the thing about me doing the same as you is changes over time. I think that's to be a certain amount of experience and a certain amount of pal Patri awareness. And that's not to say that I'm better than you or you're better than anyone else's. It's nothing to do with that. It's about being exposed to the tissue for long enough to feel this stuff. Do you get different results? To me, I, there is, in my opinion, there is a extreme predictability in, in true point work. I certainly get the same results for each patient. And you know, with my frozen shoulder technique

Steven:

Which I've taught, it's a lot of people, they get the same results as well. Of course everyone's different. Everyone brings a different thing to it, but I'm not sure if that answered the question, but that was my attempt to answer. It brought out fairly obscure topic to the table. So you're probably going to get some questions in a job. Very difficult to answer. Christopher's asked to actually, he says, would you not see the potential energy of a static object as being potentially alive? Yes. It's a matter of time.

Simeon:

Yeah, I definitely see what you're saying. I think the point I'm making here is not about potential energy. It's about as mathematical principle. The mathematics of the predictability is that complex systems have attractors within them. So appointed attractor, I Marvel at the bottom. Little ball is still an attractor. It's still doing something, but it's better not to think of it as energy more as perhaps a catalyst so that it's something that will allow other things to develop around it. It's the still point at the center of the whirlwind.

Steven :

Okay. I'll come on to his other space second bit in a minute, but it's, Sue has asked whether you would say that these attractors explain embryological development. If complex development of from a core of undifferentiated starts

Simeon:

A hundred percent, that a hundred percent, they explain all of it. They absolutely do. And that they explain as a system with the bigger questions at the beginning of the how is it that there's an emergent property from this chemical soup they've got together because actually under certain circumstances, under certain pressure and a certain heat, light temperature and nutrition, the, the proteins got together to form more complex things because of the attractors. So absolutely life exists because of the, these, these organizing principle

Simeon:

And Chris for asked to follow up, you said, is complexity, time dependent the regularity measures rely on seeing the history of its actions. The now is the only thing that exists. Therefore, is it chaos or is it simply cause and result? That's a good question. Also. What were you smoking? Are you philosophical? Well, I look, it is just sabbatical, but it's also predictable. And so I think the answer to that question would be that

Simeon:

There's a fine line between something that's highly organized and something that's chaotic. And that line is complexity. And

Simeon:

That would be the answer to it. Yeah is philosophical but, but it does explain the, the, the idea of the sort of the emergent proxy being greater than the sum of its parts. Okay. I'll let you carry on for a bit before I ask any more. Okay. So then I'm going to just bring this, now I'm going to bring it home, bring it to the fascia. So, so of course fascia is a complex system. In fact I've heard it said that there, there's a single muscle theory. Do you know that? Single muscle theory? So there's only one muscle in the body. It's just divided into lots of bits and lots of bits by the fascia. So I thought we have a look at some fascia together just to look at the complexity and bask in the glory of it. So the fascia now trickle points exists as what we call Maya in the myofascia, which is the fascia around the muscles.

Simeon:

And actually what I was saying in the slide before, which I didn't finish, there are things called poly modal receptors. Now poly motor receptors, this was a theory book by a guy called Kawasaki. And they are receptors that can be switched on under certain circumstances. They can be under certain chemical under certain structural like a pull from fascia. So under certain circumstances they can be put a switched on and they would be what I would call potential trigger points. So trigger points in potential because the, the web and the weft of the fascia takes energy from one place in the body to another. That's really what muscles are doing. They're moving bones from one place to another and the fascia, which also allows biochemical and nutritional transfer between things. I'm sure a lot of you have studied stucco's work, which is mind blowing.

Simeon:

The idea of this, this, the fact that you're having a whole life giving energetic structures within it is an incredibly complex structure. So, but it's simple. You know, it starts with the muscle and the fascia and then filaments. So let's go to the next slide. So again, we talked about this before. This is from the body works exhibition body worlds, exhibition and the skin is a complex system. Therefore, by its very definition, it must be having a tractors that are existing in it and in its form. And again, this is work by the my goodness, his name's similar anatomy trains in here what he's showing is that the, the fascia works in claims that transfers energy from one place to another. Now, trigger points exist within the myofascia. And my assertion is that they are switched on under certain circumstances.

Simeon:

We talked about last time trigger points on demand. Remember I talked about that having some player that twisted his ankle and the trigger points came on immediately. So the triple points are there in sitting there waiting to happen under certain circumstances. And these circumstances can be, as we said at the very beginning, eccentric contraction, minimal overload under different properties, different temperatures, different fractures. All sorts of things can switch on these trigger points, but, but they're never no work on their own and they're going to work in a specific way. And what I hope to show you now is my, I hope my piece de resistance is that in the trigger point software the beautiful thing about allowing me to visualize it in three D has been to, I've built the software in a company as a computer game, in a gaming system. Okay.

Simeon:

So what, why is that important? Because when you, when you apply gaming principles, you can do all sorts of things to the models that you can't do in other ways. And one of them is to have him animates. And if you watch what happens to the trigger point, pain maps when we animate, it's quite incredible. But I'm not going to show you the trigger point. Hey, max standing. What I'm going to do, and I know you've got nervous before Steven, I'm going to show you the trigger points in three days and someone in on their hands and feet. Why is that? In fact, someone put on your website, you don't play it just yet. I need to give the drum roll. Is that they put a dermatome model with someone on all fours. Was that on your website? I know it was someone, one of the, one of them on the website or it could have been on the website, which is mind blowing.

Simeon:

And it's something that I've looked at for a long time. When you put someone on all fours, the dermatomes make perfect sense. And what I'm going to show you now is that the myofascial trigger points exist as part of the body's way of dissipating force. That's what they are. And that's why they exist. And it only makes sense when we have someone on all fours. So I thought what we did just to show you that is to animate the model pants and all and to show you some of the shoulder muscles and show you what's happening in these different pain maps. Very exciting. It's the first time I'm ever launching it. I've shown you guys, so you have a first. So let's start with muscles. So let's go to hands and feet mode. Okay, sorry. This is the diaphragm at the moment. So we're just going to select, this is version one of the software by the way, infraspinatus is now, look at him from, so infra, if you look at the pain map, look at the finger. It goes all the way through the middle finger. So if you mentioned a court repaired that that finger, that middle finger is making contact with the ground. The energy is coming up through the body. So again, through the back of the hand, through the thumb, through the back of the arm, all the way up into the most is the wing muscle in birds.

Simeon:

My favourite subclavius a big maximum dogs and horses, Smalling humans. But look at this through the thumb into the elbow and up into the collarbone. Subclavius so you see the pain maps. Tell us a lot about gravity, about energy transfer. Subscapularus look at that pain map at the back of the wrist. What does that exist? Because it's part of the stabilization as the energy moves through the fascia, through the muscles and the trigger points that exist actually show you these pain maps, terrorism, minor, again, much more sort of stabilizing through the scapular.

Simeon:

So that's some of the rotator cuff muscles subscap supra infra. And so really what I was hoping to show you there was the idea that in three dimensions that when you put someone all fours, all of a sudden trigger points start to make a lot more sense than they do with someone standing up for resolve with subclavius coming down into the thumb doesn't really make sense. Subscapular back at the wrist doesn't make sense. Latisha, the store side, it doesn't make sense. But when you put someone on all fours and you show how gravity goes through the system, all of a sudden everything makes sense. So that's the big idea for today. So the idea is this is that complexity exists where there's complexity. There are strange attractors by its very nature, the muscular skeletal, my official system is complex, therefore it has to exhibit strange attractors. They are the trigger points. Strange attractors have to be there. They're permanent. They always have to be there in a complex system, otherwise it will fall apart. So there has to be complex. And I'm going to, I'm going to there's a little bit more to tell you about what we're nearly there.

Steven:

Yeah.

Simeon:

Yeah. So let's do it then because we're nearly done. So as I said before coloured kids on his name was I probably modal receptors which are switched on under certain, are they type three attractors? I would suggest they are. They're there because they have to be there. They emerge from the complexity under certain physiological circumstances and environments, they switch on as trigger points. These are the organizational and part functional part of the nervous system, negative feedback response to noxious stimuli such as trauma. That's just finished there. So remember in a lot of the lectures that we've done up to now talk about some equalled super trigger points. And I have a whole lecture on super truth. Wait, say that again. If was going back to more time, we're going to come and do some life stuff with you eventually if the plane's ever allowed to learn that.

Simeon:

So what are secret trigger points? Well, we talked about infraspinatus when we looked at the shoulder, the bisex long head of biceps being super, super trigger points for the shoulder. We talked last time about the ankle, about the Poplar Ts. Remember we said there's a super trigger point for the knees. Why is that? Is that jury when, when a body goes into a holding pattern, and remember we talked about holding patterns as an agonist, antagonist and a fixator. And that what happens is, is that the, these trigger points switch on immediately and they are what is causing that holding pattern to be there. So if we don't address them, if we don't treat them, then that problem will not get better. And how do we treat them? We have to look at the agonist and the antagonist. So, so when

we're looking at, of course they're not always the same because in a holding pattern, things sometimes shift.

Simeon:

So super trigger points aren't strange attractors in that they have to be there. They're always there, they're permanently switched on under certain circumstances. So let's just go a little bit further. Last ones now. So here's the symmetry points for the shoulder. So for the headache, for the head, the sternocleidomastoid is definitely, I would say super to the point to the scaling's for problems like complex regional pain, neurovascular problems in the hands thoracic outlet, that kind of thing. Long head of biceps for shoulder pain, always switched on for shoulder pain. Scaling's always switched on for thoracic outlet. Sternum ASOS always switched on. And headaches, always ligaments and battalion. We talked about runner's knee last time. Remember attract attachment, the points, the last time or the one before, I can't remember where we talked about runner's knee and, and w and that there's a strange attractor in there that the super tripping point in there in that that's always switched on when there's a runner's knee. Again, the extensor digitorum longest ADL just sort of medial to it is a trigger point, a trigger point. There was secretary, the point that when you hold it improves ankle stability and improves ankle range of motion. Just holding that trigger point coming to the back of the body.

Simeon:

All right infraspinatus always switched on, always switched on in shoulder problems always as is. Subscap I mean there, there I have to be there. Gluteus medius often find that in low back pain. Remember we talked about spot. It's nice. This is glute medius often works with the erector spiny and again, popliteal and knee pain. So this is just a few of them that I've observed. Again, this is part of my madness. You know, these are the things that I've observed that are always switched on under certain circumstances. It's just finished with that last slide. And I think just to go to the last one, which is this is the holding patterns. So as I said before, for me, when a body goes wrong, it goes into a holding pattern. And that holding pattern is an ancient switch off mechanism that you see in all animals.

Simeon:

You see it in dogs and horses and it's almost like the default holding pattern of the nervous system for an injury. And the reason the body does it is it switches off to protect and defend. It allows the body to fix itself and take itself out of pain. And these holding patterns are maintained by agonists, antagonists, fixators in a certain art. And if you're going to treat someone in my opinion, this way of thinking of it, looking at trigger points as sort of inputs of data neuromuscular inputs into the nervous system to, to change things is that we have to look at those relationships, those holding patterns, and find a strange attractor within that complex problem. And some questions about evolution and one in particular saying, well, does that mean these trigger points, these pain maps haven't caught up with bipedal locomotion. It's exactly the to change as we continue to embrace. Correct. And what would be really interesting would be to see the stenosis and the, and the subclavius the points in a horse and a dog, because I have been in there aren't in animals, they all tend to points because absolutely that's what it means. It means that our, we have a co or if we have, it's the way we're, we're mapped and wide is instilled in, in Quadramed mode. I believe that's true. Yeah.

Steven:

Felicity's unrealistic about the fact that no one's ever found trigger points in cadavers path

Simeon:

That they have yet babies and cadavers.

Steven:

Interesting. I mean, how did that, how can you tell a kid, how can you recognize the trigger point? Obviously you can't get a pain response. So what do

Simeon:

They found? A contraction, not contractures. Okay.

Steven:

Scott says, this all brings us to the equation of practitioner intent. Experience with suggests that this is a missing link in the entire process of our work in each two, in each communications. Now does that influence the attractors?

Simeon:

Wow. That's a big I, you're absolutely correct. Of course, intent is everything. Intent brings everything to the policy. You know, shaking someone's hand with intent is entirely different to shaking it just on my grandma, my uncle is that we squirt wet fish. You know, there's a, there's a, there's something about intent that that absolutely electrifies the vital self. It's beyond me, but I would say, I'd have to say yes. But I don't understand it yet.

Steven:

And funeral it says so the trigger point is a thing. Even if even if it doesn't elicit any pain or discomfort

Simeon:

Can be, they can be what we call. There can be latent trigger points. We see them a lot and people that have whiplash, people that have scoliosis which are trigger points that aren't painful. Generally what can happen is though, if, if under certain circumstances, like a fat person with a scoliosis injures themselves, then naturally the point might become active again. But yeah, they're, they're, they're woven into the was often West of the my fascia for sure. Yeah. Trigger point then one does not, not as some people do. Some people don't is the onset go in would say not to and his mind guru. Yeah.

Steven:

Right. Okay. Thank you. James asked whether the holding patterns are related to primitive reflexes.

Simeon:

I absolutely, I must be. Yeah. It must be absolutely. Okay.

Steven:

A Jono can the practitioner not be considered a strange attractor and entering the patient's system of influence?

Simeon:

A hundred percent, a hundred percent. Listen, I, you know, there are people in my life that I've come in and that things have happened, you know, just things that happen around them. And I've been that to other people as well. So absolutely. All of this stuff is operating in complex levels, in all different levels.

Steven:

Good. And Justin says the question he has is if trigger points emerged as a requirement in a complex system, then is removing them detrimental.

Simeon:

Ooh, that's a good one, isn't it? Just any, you remove them, but to deactivate them. Yeah. I think that part of the intelligence of the system, they're part of the self-correcting called the system. They're, they're actually as part of the protect and defend mechanism. So I would argue that, that they are that as part of the intelligence of the body where they're there to guide us to actually the self healing part of the body. That, that bit, so we said at the beginning of the vital energy that's block cheap blockchain.

Steven:

Joan says lots of the techniques you've demonstrated have been performed prone. Are there any problems treating a patient's trigger points if they can't easily lie prone? For example, pregnancy and acute pain?

Simeon:

Of course there are very many ways of treating people lateral decubitus sideline prone supine that there, there are, there are thousands of different settings. I mean, it's quite difficult to treat the back muscles supine, but you can do them sideline, you can get quadratus lumborum erector spinae with them. I, it tells me demonstrating I think it was a lot to do with my algorithms that I've worked at work for me. But I again, if someone comes in, like, you know, I've had people come in with frozen shoulders with an artificial limb or you know, you have to adapt, but I was just showing you the, the, the,

Steven:

Yeah. And I, and I guess actually if you've got a patient who's comfortable Previn or supine, then it's probably, it's the simplest way to treat these things, isn't it? And you might find other positions where necessary. But yeah. James asked a question and Jane Fox, I apologize that I'm not quite sure what you're referring to. She says, isn't that one of the issues with chiropractic, osteopathic practical treatment that is so difficult in randomized control trials and I'm not quite sure whether she was ready to explore into a specific elements of what you said.

Simeon:

I suspect she's talking about the observer effect and also the incident of reliability. It's a practitioner reliability. Yeah. Yeah. I just say note to self or my is the, I actually had Corona low back pain. I've never really suffered with low back pain on and off, but not, thankfully. It's never been one of my things. And I was an L full facet, no question about it. Well facet. And I went to three different people, two different people, different and I had some legal language health and I'm just saying this is absolutely, you know, I'm just giving it as it is. I went for an adjustment with a chiropractor who cracked it and it felt worse for 24 hours. I could feel like stabbing pain the next day, 50 60% better. I'm just saying. So clinical trials, low back pain, does the adjustment help? Doesn't it help you know where you know, we know where are the coalface here? We know, we see it every day in our clinic there are, okay. So there's no randomized placebo controlled clinical trials. But you know, it's funny actually someone wants, one of my friends are very beautiful, very beautiful, is a medical doctor, very experienced. He said there's evidence based medicine and there's medicine-based evidence. And I think that that is the biggest wisdom that I Oh yeah.

Steven:

So I mean thank you very much. The name of the questions, questions, but I've been told that there've been loads and loads and loads of fun cues for you and people are really impressed with the whole of this eight series lecture series that you've done for us. I, I really wish the success with the app as well because I find the whole animation and the trigger maps and all the reference materials in there, I find it very impressive. Amazing. Think.

Simeon:

No, I think as osteopaths it is important to know these maps because when someone comes in with pain here and you notice subscapularis, you know, that's, that's a great advantage. And we know, when you say osteopaths, you mean osteopaths and chiropractors and osteopaths, physios. And in fact, it's it's the language of touch that we will not, and again, you know, just to say that there's, there's a lot more about triple points on my Facebook page. And thank you very much.