Chaos and Complexity - Ref 46SNA

with Simeon Niel Asher

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TRANSCRIPT

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Steven:

Simeon, welcome back to the forum.

Simeon Niel Asher:

Thank you very much, thank you for having me.

Steven:

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

Simeon Niel Asher:

Something quixotic even.

Steven:

Okay. Lead us on.

Simeon Niel Asher:

Okay. Well first of all, you know, 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 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 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. So, I thought we'd finish today, kind of, we started a bit esoteric with the language of touch, I thought we'd wrap it up with something a bit different.

Steven:

Yeah. Okay.

Simeon Niel Asher:

Yeah. So, we're going to explore sort of the ideas of chaos and complexity theory, the vital self, and we're going to look at how that all applies to trigger points and perhaps clinical importance of that as well. So, I thought we'd start with the first slide. So, first of all, as I understand osteopathy and I think, you know, I went to a very mechanical osteopathic college that, what's it called now, the UCO, I think, university or whatever. It was, it used to be called the BSO. And we were quite a 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. 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 truths 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 sort of main tenets of osteopathy, there's this idea that the body is capable of self-regulation, certainly 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, the body is a unit, and the idea that the body has self-regulatory, functions that want to get better, so you break a bone and it fixes itself. What is the surgeon compared to the healing of the body after the surgery?

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 more sort of, a different paradigm. So, let's go to the next slide. So, I think, 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 interplay between sort of holism, reductionism, this interplay between sort of taking everything and breaking it down to its systems. Certainly, we see that as medicine has become more complex. There's certainly been more specialisation within it. I mean, I can't talk, I'm a specialist of shoulders within 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 sanitised 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 Gestalt therapy, which is a type of psychotherapy, is based completely on that. And then the ideas of vitalism and holism, the idea that there's a kind of vitality that emerges from the complexity of self. And 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 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 to 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, metatarsals. But there's something about putting this stuff together, 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 with going on without talking about Mandelbrot set fractals.

Simeon Niel Asher:

Oh no, we're coming back it. I wouldn't do that to you. So actually, I'm not joking when I said that this got me into a, this was a book from my great uncle, the book of - 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 really the Bible for many years of naturopaths. The idea of the vital self and vitality is the 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, in other mindsets. 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, 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 phenotypes, genotype, everything has a role to play. But certainly, what vitalism and the vitality or the vital forces, this intelligent animation within every person. And this is a concept which is very familiar to osteopathy. I'm sure it's something not new that I'm talking to you about. So where does that come from and how is all this kind of fitting together? 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, Poincaré started this very interesting theoretical mathematics, looking at what he called non-periodic orbits. It started off by looking at the planets, the way planets orchestrate around one another. And there was like a nonlinear dynamic. 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 a big book that really said a lot of stuff and what it said really was that there's an underlying chaotic principle that has properties of life. 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 something different. Chaos has mathematical, underlying principles. So, like I said here, one way of looking at it is if, imagine 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 no order. But of course, everyone has their vector, 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, it's actually highly ordered, except that it is chaotic. So, applying this kind of thinking to systems theory has really started a whole different branch of maths 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 certainly a mathematical model, but of course chaos, what looks like chaos and complexity are 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, to explain nonlinear systems like the weather. So, there was this idea of a butterfly effect. The butterfly would flap its wings in Brazil and it would change the weather in Siberia. So, the idea of this interrelated interconnectedness came from chaos theory. So, that was quite interesting. I mean, the whole idea of this very simple rules having extremely diverse, intricate, complex behavior. 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 fractile. And of course, many of you know about fractiles, they're sort of points that are repeated. 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, it's a fractile. You look at the leaf structure, it's a fractile, it's this 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. There's this holographic kind of content to it. 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 that's where chaos is. So, let's go to the next slide if we can. I think it's the weather. So yeah, play this one for me. And I want you to look at the, this is true, complex, true chaos. 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, I know it's a vector, you would have a highly predictable model, but as it is, weather is extremely unpredictable. Yeah. So, the idea here is the weather itself is 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 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. 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's this, sort of this idea of something becoming more complex and rather than, you know, the second law of thermodynamics that says everything should becoming less complex. And then, again, even on a societal level, why is it, there's these organisations that starts happening to families and tribes and communities and nations and wherever we look at complex systems, there seem 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, I got quite into sort of neurology for a while and I was reading something about 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 of self, again, you know, so 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 sort of chaos and where does complexity really exist? 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 can happen. And it's the same with complexity. You need a very defined set of principled criteria and then 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 the thing about the edge of chaos and complexity is that it allows for dynamism and it allows for dynamic change. 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 maths and it's the maths of complexity. Much like I said before, when someone's looking down on the street and there are always vectors, complexity has its own mathematical beauty 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 and look 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, it's pan-disciplinary in terms of like economics, anthropology, history. So, I'm going to just give you an example. So complex systems theory has been applied to a whole range of things. And I'm gonna 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 center of it, the attractor, we're going to look at what attractors are shortly. And around that there came people that made the leather and people that bought the leather and 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.

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 within 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. But it's just a bit of fractiles in that, that is just the most incredible thing, that is pure complexity theory, very simple pattern that's 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 luteinising hormone, that's a little bit more complex for the body to, deal with. The whole triggering of the egg, FSH and all that stuff. So also, what's really important is this concept of emergence, this idea that the emergent property as you become more complex is greater than the sum of its parts. 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 edge 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 Niel Asher:

Yeah, yeah. Well, just allow me to go on one more slide and I think we're going to, I think, 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. 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 technologies got better, as the memory and the powers 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 been absolutely incredible on stock markets, on social networks, all sorts of things. But no one has really applied it to the musculoskeletal system. And I think that actually, that's where I'm going with this, is the trigger points are the strange attractors within the complexity of the musculoskeletal system, the myofascial system. Okay, bear with me a little longer. It's all gonna make sense very shortly, promise. Okay, so let's make sense of it now. So, this is a guy called Stephen Wolfram 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 Tamagotchis, those little things you had to feed. 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, these cellular automata where we're given certain stimuli and then they were modeled and he saw what 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 organisational properties that come out of this random chaotic automaton. If under certain circumstances they will organise themselves and there are three things that happen. 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, I'll just explain it like this, this is how it was explained to me is 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 - it's just attracted to the bottom of the bowl. 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. And that is what's called a periodic attractor. 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 that we see, especially in the cosmos. We see a lot of this stuff happening. And then the third one is the strange attractor. And it was amazing, when you read his work, the way he put it was, he said, I sat down, 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. So, we're going to have a look at those things now. So, his genius was to recognise there were three things. So, let's look at these classes. So, in terms of cellular automata, which are relevant - I hope 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. So, this is a, I'm going to 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 is a mind-blowing book, but basically complexity, life, is all about strange attractors and 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 border, like we said, between the oil and the water, under certain properties, they will emerge always and they are the organising principles around which complexity emerges. They need to be there. 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 organisation, the organising principle around things are, so we said before about the horse and the cart, the horse will become the stranger attractor. All these industries would spin around it and start to grow. And then along comes the automobile and then you've got all these other industries, that becomes a strange attractor and all these other stark things, 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're like the organisation around which everything else seems to organise itself. Okay. It's getting better or it's getting really interesting. So, this is why it applies to many systems and I absolutely guarantee, and I'll put his Nobel prize on it, that the muscular skeletal system, which is a very complex system has strange attractors in it. 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. Oh, so yeah, this is a video. So, this is a periodic attractor. This is what they look like. So, these are the vectors that he's looking at. This is a guy called Lorenz and he modeled cellular automata and he gave them certain, so we're looking now at a type two periodic attractor. 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 sorts 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 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, in the cardiovascular system. Periodic attractors occur during heartbeat as well, it's called the butterfly effect. So, let's move on now to the next slide if we can. Strange attractors. So, 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 vaporise 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, 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, again, organising principles, basically emergence. The emergent properties are greater than the sum of the parts. Something beautiful arises from something very basic and simple. You know, I can see a rhino here, I can see a snowdrop and all of these incredible, just from very simple complexity, the emergent property of the complexity. So, okay, we can move to the next slide. So, where does this take us? Well let's bring it down 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 Niel Asher:

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 interbeat interval. So that's the RR, that's the interbeat interval, the interval between each of the heartbeats. And what happens is if you take a population and you measure their interbeat interval and you plot it, you usually get 72 beats a minute. The heart resting mostly at 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, 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, arhythmia, 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. Coffee and stress and thinking about doing your bank and Corona and all these things that are affecting the heartbeat. So actually, we've internalised 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 is a dead system.

Steven:

Would you like three questions?

Simeon Niel Asher:

Very close. Should I just finish that slide?

Steven:

Sorry, I thought you had finished it.

Simeon Niel Asher:

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 want 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 there are things called poly modal receptors that exist within the myofascia. But okay, you ask your questions and then I'll go on to that.

Steven:

Okay. Siad has asked, based on what you've explained, does it 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 Niel Asher:

Okay. So, inter-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 he's talking about. So, there is a reliability. In fact, there was a very big paper that was published recently about reliability and in trigger 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've all been at it for more than 10 years. So, I think the thing about me doing the same as you changes over time. I think there has to be a certain amount of experience and a certain amount of palpatory awareness. And that's not to say that I'm better than you or you're better than anyone else. It's nothing to do with that. It's about being exposed to the tissues for long enough to feel this stuff. Do you get different results to me? There is, in my opinion, there is an extreme predictability in trigger point work. I certainly get the same results for each patient. And you know, with my frozen shoulder technique, which I've taught to 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.

Steven:

You've brought out a fairly obscure topic to the table. So, you're probably going to get some questions which are very difficult to answer. Christopher's asked too actually, he says, would you not see the potential energy of a static object as being potentially alive? Is it a matter of time?

Simeon Niel Asher:

Yeah, I definitely see what you're saying. I think the point I'm making here is not about potential energy. It's about a mathematical principle. The mathematics of the predictability is that complex systems have attractors within them. So, a point attractor, a dead marble at the bottom of a bowl 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 second bit in a minute, but Sue has asked whether you would say that these attractors explain embryological development. Development from a pool of undifferentiated cells.

Simeon Niel Asher:

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

Steven:

And Christopher has to follow up, he 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?

Simeon Niel Asher:

That's a good question also. What were you smoking? Well, look, it is philosophical, but it's also predictable. And so, I think the answer to that question would be that there's a fine line between something that's highly organised and something that's chaotic. And that line is complexity. And that would be the answer to it. Yeah. It is philosophical, but it does explain the idea of the sort of emergent property being greater than the sum of its parts.

Steven:

Okay. I'll let you carry on for a bit before I ask any more.

Simeon Niel Asher:

Okay. So, then I'm going to just bring this now, I'm going to bring it home, bring it to the fascia. So, of course fascia is a complex system. In fact, I've heard it said that 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 divided into 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 trigger points exists as what we call myofascia, which is the fascia around the muscles. And actually, what I was saying in the slide before, which I didn't finish, there are things called polymodal receptors. Now polymodal receptors, this was a theory brought 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 switched on and they would be what I would call potential trigger points. So, trigger points in potential because the web and the weft of the myofascia 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. The idea of the fascia having a whole life, giving energetic structures within it is an incredibly complex structure. But it's simple. You know, it starts with the muscle and the fascia and the filaments. So, let's go to the next slide. So again, we talked about this before. This is from the Body Worlds exhibition and the skin is a complex system. Therefore, by its very definition, it must be having attractors that are existing in its form. And again, this is work by Thomas Myers, Anatomy Trains, in here what he's showing is that 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. We talked about last time trigger points on demand. Remember I talked about that badminton player that twisted his ankle and the trigger points came on immediately. So, the trigger points are there in situ 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 they're never going to 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 visualise it in 3D has been to, I've built the software as a computer game, in a gaming system. Okay. So why is that important? Because 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 animate. 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 pain maps 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 3D and someone on their hands and feet. Why is that? In fact, someone put on your website, 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? It was on the website, which is mind blowing. 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'd do 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're the first. So, let's start with muscles. So, let's go to hands and feet mode. Okay. 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. Now look at infra. 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 imagine a quadruped, that finger, that middle finger is making contact with the ground. The energy is coming up through the body, through latissimus dorsi, again, through the back of the hand, through the thumb, through the back of the arm, all the way up into the latissimus, is the wing muscle in birds. My favourite, subclavius a big muscle in dogs and horses, small in humans. But look at this, through the thumb, into the elbow and up into the collarbone, the 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. Why does that exist? Because it's part of the stabilisation as the energy moves through the fascia, through the muscles and the trigger points that exist actually show you these pain maps, teres minor, again, much more sort of stabilising through the scapula. 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 on all fours, all of a sudden trigger points start to make a lot more sense than they do with someone standing up. For example, subclavius coming down into the thumb doesn't really make sense. Subscapularis, back at the wrist doesn't make sense. Latissimus dorsi, 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, myofascial 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. Yeah. So, let's do it then because we're nearly done. So, as I said before, Kawakita his name was, polymodal receptors which are switched on under certain circumstances, 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 organisational and functional part of the nervous system, negative feedback response to noxious stimuli such as trauma. Let's just finish there. So, remember in a lot of the lectures that we've done up to now, I talk about something called super trigger points. And I have a whole lecture on super trigger points. We're going to come and do some live stuff with you eventually, if the planes ever allowed to land there. So, what are super trigger points? Well, we talked about infraspinatus when we looked at the shoulder, the biceps, long head of biceps being super trigger points for the shoulder. We talked last time about the ankle, about the popliteus. Remember we said there's a super trigger point for the knees. Why is that? 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, that 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, when we're looking at, and of course they're not always the same because in a holding pattern, things sometimes shift. So super trigger points are 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 super trigger points for the shoulder. So, for the headache, for the head, the sternocleidomastoid is definitely, I would say super trigger point, the scalenes 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. Scalenes always switched on for thoracic outlet. Sternomastoid always switched on in headaches, always. Ligamentum patellae. We talked about runner's knee last time. Remember attachment trigger points, the last time or the one before, I can't remember, where we talked about runner's knee and there's a strange attractor in there that the super trigger point in there that's always switched on when there's a runner's knee. Again, the extensor digitorum longest EDL just sort of medial to it is a trigger point, a super trigger 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. Infraspinatus, always switched on in shoulder problems, always, as is subscapularis, I mean they have to be there. Gluteus medius often find that in low back pain. Remember we talked about spondylolisthesis. Glut medius often works with the erector spinae and again, popliteus 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. Let's just finish with that last slide 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. 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 change things is that we have to look at those relationships, those holding patterns, and find a strange attractor within that complex problem.

Steven:

Ok some questions for you to answer. We've had a couple about evolution and one in particular saying, well, does that mean these trigger points, these pain maps haven't caught up with bipedal locomotion?

Simeon Niel Asher:

Yes exactly.

Steven:

Another one saying would you expect them to change as we continue to evolve?

Simeon Niel Asher:

Correct. And what would be really interesting would be to see the sternalis and the subclavius trigger points in a horse and a dog, because they are in animals, they are tender points, because absolutely that's what it means. It means that we haven't caught up, or if we have, it's the way we're mapped and wired is instilled in a quadraped mode. I believe that's true. Yeah.

Steven:

Felicity's asked about the fact that no one's ever found trigger points in cadavers.

Simeon Niel Asher:

They have.

Steven:

They have?

Simeon Niel Asher:

Yes, babies and cadavers.

Steven:

Interesting. I mean how can you recognise the trigger point? Obviously, you can't get a pain response. So, what do you find?

Simeon Niel Asher:

They found a contraction or contractures.

Steven:

Ok, Scott says, this all brings us to the equation of practitioner intent. Experience would suggest that this is a missing link in the entire process of our work - innate to innate communications. Now does that influence the attractors?

Simeon Niel Asher:

Wow. That's a big question. I, you're absolutely correct. Of course, intent is everything. Intent brings everything to the party. You know, shaking someone's hand with intent is entirely different to shaking it on my grandma or my uncle that is like a squirt from a wet fish. You know there's something about intent 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 Fiona says, so the trigger point is a thing even if it doesn't elicit any pain or discomfort.

Simeon Niel Asher:

Can be, they can be what we call latent trigger points. We see them a lot in people that have whiplash, people that have scoliosis, which are trigger points that aren't painful. Generally, what can happen is though, if, under certain circumstances, like a fat person with a scoliosis injures themselves, then that trigger point might become active again. But yeah, they're woven into the waft and weft of the myofascia for sure. Yeah.

Steven:

Would you treat a latent trigger point then, one that's not causing problems?

Simeon Niel Asher:

Some people do. Some people don't, is the answer. Gerwin 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 Niel Asher:

Absolutely, they must be. Yeah. Okay.

Steven:

John - can the practitioner not be considered a strange attractor entering the patient's system of influence?

Simeon Niel Asher:

A hundred percent, a hundred percent. Listen, you know, there are people in my life that have 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 Niel Asher:

Ooh, that's a good one, isn't it? Just that you remove them, but to deactivate them. Yeah. I think they're part of the intelligence of the system, they're part of the self-correcting part of the system. They're there actually as part of the protect and defend mechanism. So, I would argue that, they are there, 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, we said at the beginning, the vital energy that's blocked chi.

Steven:

John 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 Niel Asher:

Of course, there are very many ways of treating people, lateral decubitus, sidelying, prone, supine, there are dozens of different techniques. I mean, it's quite difficult to treat the back muscles supine, but you can do them sidelying, you can get quadratus lumborum, erector spinae, all of them. In terms of me demonstrating I think it was a lot to do with my algorithms that 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 principles.

Steven:

Yeah. And I, and I guess actually if you've got a patient who's comfortable prone 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 Faulks, I apologise 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 randomised control trials and I'm not quite sure whether she was referring to a specific element of what you said.

Simeon Niel Asher:

I suspect she's talking about the observer effect and also the inter-reliability, the inter-practitioner reliability. Yeah. I just say note to self, 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 it was an L4 facet, no question about it. L4 facet. And I went to three different people, two different people, and I had some needling which helped 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 adjustment help, doesn't it help? We know we're at the coalface here? We know, we see it every day in our clinic. So, there's no randomised placebo controlled clinical trials. But you know, it's funny actually someone, one of my friends, very beautiful, 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 heard from.

Steven:

Simeon thank you very much. There are no more question but I've been told that there've been loads and loads and loads of thank yous for you and people are really impressed with the whole of this eight-lecture series that you've done for us. 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.

Simeon Niel Asher:

I think as osteopaths it is important to know these maps because when someone comes in with pain here and you know its subscapularis, you know, that's a great advantage.

Steven:

And we know, when you say osteopaths, you mean osteopaths and chiropractors.

Simeon Niel Asher:

Osteopaths, physios. And in fact, it's the language of touch that we all work with, and again, you know, just to say that there's, a lot more about trigger points on my Facebook page.

Steven:

Thank you very much, Simeon.