ADDitude: Hello, everyone. I'm Carole Fleck, and on behalf of the ADDitude team, I'm delighted to welcome you to today's ADHD Experts presentation titled, "How Joint Hypermobility Links Neurodivergence, Chronic Pain, Inflammatory Disorders, and Anxiety." Leading today's presentation is Dr. Jessica Eccles.

Dr. Eccles is a researcher at the Department of Neuroscience at Brighton and Sussex Medical School in the United Kingdom. Her areas of expertise include brain-body interactions, joint hypermobility, and neurodevelopmental conditions. Her PhD work focused on the relationship between joint hypermobility, autonomic dysfunction, and psychiatric symptoms.

Dr. Eccles asked us to begin today's webinar by asking these questions on screen to see if you're hypermobile. Please provide your answers and comment in the text box under the video player to tell us more. And if you answer yes to two or more questions, you are likely hypermobile.

For answers to common webinar questions about slides, transcripts, and certificates of attendance, click on your FAQ tab on your webinar screen.

If you support the work we're doing here at ADDitude to strengthen the ADHD community, we encourage you to sign up for "ADDitude" magazine. Our summer issue is out now, and it's our first-ever women's issue. It's all about how ADHD is profoundly different for women and how hormonal shifts intensify symptoms and even affects medications effectiveness in some cases. We also have an important article by a leading physician on treating ADHD when a person has co-occurring conditions.

So sign up for "ADDitude" magazine today for yourself or to share with a teacher or a loved one who could benefit from greater ADHD understanding. And we have an exclusive subscription offer for webinar participants. Sign up today and enjoy 15% off your order. Plus, you'll get a free copy of the ADDitude ebook, "How the ADHD Brain Works," an $8.95 value. Click the link on your screen to get 15% off ADDitude and your free ebook now.

So, without further ado, I'm so pleased to welcome Dr. Jessica Eccles. Thank you so much for joining us today and leading this discussion.

Dr. Eccles: Thank you so much, ADDitude, for inviting me to ADDitude. It is a resource that I recommend to my patients.

I just want to have some disclosures here. I have been funded by a number of research charities and grants councils, but I have no other financial or significant disclosures.

I'm going to tell you a little bit about who I am. So obviously I'm from the UK, where things are maybe a little bit different. I'm a medical doctor. I also have a PhD. I trained to be a clinical academic psychiatrist, so I spent a proportion of my time throughout my psychiatric training doing research as well as clinical work. And I trained in two things in psychiatry. One was in liaison psychiatry, which is the link between the brain and the body, and the other was in neurodevelopmental conditions.

I work in a wonderful neurodevelopmental service in the NHS in Sussex called Sussex Partnership, where we have the world's first Neurodivergent Brain-Body Clinic, which myself and Rebecca Dew and Hugo Critchley set up.

I'm also proud to be a patron of a charity specifically for neurodivergent hypermobile people, SEDSConnective, and also a charity, ADHD Aware. Within our college in the United Kingdom, the Royal College of Psychiatrists, I head our neurodevelopmental psychiatry group.

So today I'm going to talk to you about a big idea. Normally, when we think about ADHD and neurodevelopmental conditions, we think of them as brain types. And what I want to talk to you really is about differences in the body.

Should we drop the distinction between mental and physical health? The current distinction holds back research and stigmatizes patients. And I'm going to use hypermobility as an example of how the brain and body are dynamically coupled.

So this is a slide depicting some common features of hypermobility. You see there a child sitting in the W position, people having elbows that bend slightly backwards, swayback knees. That was how I was identified as hypermobile at medical school. On a ward round, I was told I had swayback knees. People whose fingers curl upwards, people who can do this backwards yoga pose, and being able to bend your thumb back onto your wrist.

So you might be thinking, "What does having flexible joints have to do with a neurodevelopmental condition like ADHD?" Well, it's far more than having flexible joints. Joint hypermobility is actually a red herring. It is the product of a difference in the cling film in our body, the connective tissue, which is everywhere, which means that joints can move further than they normally should. It's actually relatively common.

Now, not all people who are hypermobile will have problems, but about one in five people have flexible joints. It can be highly advantageous. So I know in America you have Simone Biles and Michael Phelps. Amazing Olympiads. Well, they both are hypermobile and have ADHD.

But because this connective tissue, this cling film, is everywhere in the body, hypermobility is linked to a huge number of medical issues. And these issues cross systems, different bits of the body, the cardiovascular system, respiratory system, neurological system, and they involve both the body and the brain.

And one of the big problems is that the language around hypermobility is so confusing. So there are all of these different terms. There's GJH, GJL, JHS, HEDS, EDS, EDS3, EDSHT. It goes on and on. And I think this has held back clinical practice and research quite a bit.

But as you can see from this slide that I think came out around about the time I was doing my PhD, so a while back, hypermobility is in fact linked to so many different things. So if any of you have been to the dentist and found that the local anesthetic didn't seem to work or have easy bruising, flat feet, clicky jaws, all of these things are linked to hypermobility. And so many gut problems. So reflux, gastritis, irritable bowel syndrome, inflammatory bowel disease, they are all linked.

And the reason I first got into hypermobility was because of anxiety. So a group of Spanish researchers, Antonio Bulbena and Rocio Martin-Santos, they took 100 people with panic disorder, and they found that 70% of them were hypermobile, compared to 20% in the general population.

We went on to look at this in people . . . We did brain imaging, and we looked at the brain structure of hypermobile people, and we found, really interestingly, for the first time . . . No one had ever looked at hypermobile brains before. We found differences in a part of the brain called the amygdala.

Now, the amygdala is the center for fear and emotion processing, and they were different in hypermobile people. We also saw differences in brain structure that were similar to those seen in ADHD and autism. And so I spent my PhD trying to work out how you get from having flexible joints to having a panic attack.

And you might think, "I'm not sure what the connection could be." But if you imagine that this cling film in your body . . . which is everywhere. It's in your muscles. It's in your veins. And if you do something, if you shift, so you go from lying to standing, or you have a large meal and blood starts pooling in your gut, or you have a hot shower or a hot bath and blood pools in the extremities, it's got to get back to the heart, because the heart needs to maintain its output in order to perfuse the brain and the other organs.

But if you've got floppy connective tissue, then that means that the blood is less likely to get back to the heart easily. And as a consequence, your heart rate has to go up. So you might feel dizzy, lightheaded, heartbeat-y, palpitations.

And for some people, this is manifest as something called postural tachycardia syndrome, which is where your heart rate rises more than 30 beats per minute when you're standing.

So if you think to yourself, "Oh, I get a terrible head rush every time I stand up," that isn't actually normal. It could be a sign of underlying problems with the autonomic nervous system, dysautonomia.

So what we know is that when this part of the involuntary nervous system, the fight-or-flight nervous system, works differently, unfortunately, problems are more likely to develop.

We looked at thousands of children in the United Kingdom, 8,000 children or so, and we saw whether they were hypermobile at 14. And being hypermobile at 14 predicted common mental health problems like anxiety and depression at 18.

We've just recently published some brain imaging. So the brain imaging I showed you before was structural brain imaging. This type of brain imaging is functional brain imaging, where we're looking at the patterns of activity in the brain when the brain is looking at something.

So what we did is we took a group of people with anxiety and a group of people without anxiety, half of them hypermobile and half of them not, and we put them in the brain scanner, and they looked at emotional faces. And what we found was that, in the front part of the brain, the frontal lobe, there was less activity if you were hypermobile and anxious than you would expect.

The frontal part of the brain is like the control center. And people talk about this in ADHD, executive dysfunction. That is mainly a frontal phenomenon.

Then what we also found was that there was increased activity in left amygdala, a part of the brain that's involved in fear and emotion and threat processing, and also another part of the brain called the insula, which represents the internal state of the body.

So really, what it suggests is there is this tug-of-war between the reactive emotional parts of the brain and the control centers in the brain that try and regulate our emotions.

So we've also shown in . . .

ADDitude: Dr. Eccles, can you hear me? I'm sorry to interrupt. Can you move your microphone perhaps a little bit away from your mouth so we don't hear the breathing as much? I think that's better.

Dr. Eccles: Okay. That's absolutely fine. Yes.

ADDitude: Thank you so much.

Dr. Eccles: What we've been doing is we've been looking to see how hypermobility is related to so many different psychiatric conditions. So we've been looking at things like anxiety and depression, but also at things like eating disorder and bipolar disorder and self-harm.

So how does hypermobility link to neurodivergence? Well, since I went to medical school, we have learned so much more about neurodevelopmental conditions like ADHD and autism.

For example, when I was at medical school, I was told that ADHD and autism are nine times more likely in boys than girls. We know that this is not the case, that gender stereotypes are complex and a challenge, that ADHD and autism are far more than sort of fidgeting and boys interested in bus timetables.

We know that many key elements of being autistic, of having ADHD, are not captured well by the diagnostic criteria. And that's things like variable attention, variable energy, and variable emotion regulation.

We know that co-occurrence is the norm rather than the exception. So if you are autistic, you're probably more than half as likely . . . More than 50% of autistic people also have ADHD, or they have another neurodivergence like dyslexia or developmental coordination disorder.

So not only is co-occurrence with other neurodivergent conditions the norm, but so is with other physical and mental health problems. And this may be because of hypermobility.

I think it's also important that we use language that is respectful to the community.

So this slide was prepared by the charity of which I'm a patron, SEDSConnective, and it's basically just showing the huge umbrella of neurodivergence, of which just ADHD and autism and Tourette syndrome are a part.

So the work that we did, which is really quite groundbreaking, was published in 2022. It's now been seen on the internet nearly 200,000 times. We took 110 patients with ADHD, autism, and Tourette syndrome diagnoses, and we looked to see if they were hypermobile. We also looked to see if they have common hypermobility-related symptoms like dizziness on standing and pain.

We found that the neurodivergent group reported far more physical health symptoms and were four times as likely to be hypermobile. And what we showed mathematically was that hypermobility in fact explained the link between being neurodivergent and having these sort of physical health problems.

What we also showed was, in our female participants, 80% of them had generalized joint hypermobility. Now, not all people who are hypermobile have Ehlers-Danlos syndrome, but all people who have Ehlers-Danlos syndrome are hypermobile.

So what did this mean? It meant that neurodivergent people are more likely to be hypermobile. And this may explain why neurodivergent people have physical health problems like pain and brain fog and dizziness on standing.

Another area of research has been chronic pain and fatigue. And we took a large number of people with diagnoses of fibromyalgia and ME/CFS, that's chronic fatigue syndrome, and we showed that 80% of them were hypermobile.

We also did some experimental challenges. So we put people on a tilt table, which is one way of provoking the fight or flight nervous system, and we put them in the brain scanner, and we gave them an inflammatory challenge, which was a typhoid vaccination.

We found that if you were a patient with pain or fatigue, the autonomic challenge induced pain because of the number of connective tissue features associated with hypermobility. And we showed that, if you were a patient, going on the tilt table induced fatigue because of your baseline level of inflammation.

So there are some basic blood tests that you can do to look for inflammation: C-reactive protein and erythrocyte sedimentation rate. And we found, in patients with chronic pain and fatigue, that they were just at the edge of what is considered normal, but that the people without pain and fatigue, their blood results were significantly lower.

We gave people the inflammatory challenge, and we found that some people with hypermobility have this particular feature of having long, spidery fingers and toes. It's called arachnodactyly.

Now, you may be able to see how I can overlap my thumb and my little finger around my wrist. That is called the wrist sign. And the thumb sign is where I can protrude my thumb to the other side of my palm.

What we found is, in those people with hypermobility, that the inflammatory challenge provoked symptoms because of the underlying reactivity of their inflammatory system.

Now you might think, "What does that mean, inflammatory challenge, underlying inflammatory system?" Well, this is a bit like COVID. So you come along, and you have an inflammatory challenge that is a natural inflammatory challenge, an infection like COVID, and then that causes more symptoms. And what we showed is in these hypermobile people, it was because of their immune response.

We then went on in a large study in the United Kingdom, the COVID Symptom Study Biobank. We looked at 3,000 people who'd had COVID, and we found that if you were hypermobile by scoring two or more on those five questions that came up at the beginning of the webinar, you were 30% more likely to have not recovered from COVID, i.e. to have developed long COVID.

And this is work we've replicated now in a sample in the United States, and we are hoping to have published soon.

So why is it important to think body-brain? It's important because we need more research into why this relationship exists, more recognition awareness, and better and improved access to personalized healthcare.

Now, for example, one of the interesting studies that we've done recently . . . And you can see on my Linktree. Linktree is a collection of links, and I have papers and presentations, Bendy Brain. We have a paper where we show that if you have neurodivergent characteristics, you're more likely to experience emotion regulation problems because of a sense of uncertainty about where you are in space.

And we know that people with ADHD are more likely to be clumsy. They're more likely to have disposition dyspraxia. But that relationship is twice as strong if you were hypermobile.

Now, if you think about it, lots of people with emotion regulation problems, ADHD or not, try antidepressants. They try psychiatric medication. It may work, but they may have lots of side effects. Or they try psychotherapy, and it doesn't seem to suit. By exploring this relationship between the brain and the body, we're basically opening up new avenues for possible interventions and treatments.

So it may be, on the basis of the paper that I just described, that improving sense of awareness about where you are in space could theoretically help with emotion regulation in hypermobile neurodivergent individuals.

We're also doing some research at the moment which . . . I unfortunately recently prolapsed a disc in my back, so I can't travel easily. But my colleague, Professor Kevin Davis, we're presenting at a rheumatology conference how if you look at hypermobile people, at what's happening in their cells . . . so at the genes that are being turned into proteins, the kind of instruction manual for the cell at any one time. If we look to see what that instruction manual, that fingerprint, looks like in other conditions, hypermobility is looking like it might be an autoimmune condition, the type of condition where the body starts to attack itself.

We then looked, and we gave people the inflammatory challenge, the typhoid vaccination, and then we looked to see what conditions that fingerprint looked like. And they looked like ADHD, it looked like autism, it looked like bipolar, it looked like substance misuse. So I think understanding these brain-body connections is absolutely so important.

We know that nearly half of neurodivergent individuals surveyed by Embracing Complexity, a UK-based coalition of neurodevelopmental charities, felt that their treatment of mental or physical health symptoms was worse because they are neurodivergent.

We know that our own involvement work tells us that neurodivergent people struggle for years to get a proper assessment and diagnosis for both mental and physical health problems. But they feel a strong sense of being dismissed, misbelieved, or overlooked when interacting with professionals and institutions, and that they repeatedly encounter poor understanding and few or no adjustments for their needs within healthcare and education settings.

And I just wanted to say I've given you a lot of information all at once, but when we talk to patients, particularly in our Neurodivergent Brain-Body Clinic, people seem to often think, "Ah, this is lots. This is connecting lots and lots of dots. This is a bit of a lightbulb moment for me."

And here are some quotes from the internet after people are reading about the research. So here, Ashley says, "Hot damn, this was validating to read. You're telling me that my hypermobility, ADHD, emotion dysregulation, anxiety, proprioception," that's the sense of where you are in space, "vestibular," that's to do with your ear and balance, "interoception," the inner sense of what's happening in your body, "autonomic, flight or fright nervous system, chronic pain, and fatigue, etc., are all connected? I already knew, but maybe science is catching up."

And then a colleague, "Thank you for joining the dots so comprehensively. I'm still reeling from your talk."

I gave a podcast on YouTube recently, and a comment was, "I sobbed through this. I'm 70 and things that I've been through that medics haven't understood all explained in this wonderful conversation. Thank you so much."

So do go to my Linktree and check out that podcast, "The ADHD Chatter" podcast.

And then we have someone saying, "Undiagnosed ADHD-er here. I could have cried when you said it about affecting your gut and emotion regulation." So bendy people have gut collagen where they should have joint collagen, and they have joint collagen where they have gut collagen. You can imagine that this means that the way the gut moves is different, but if you put a camera down there, you don't necessarily see that. But what is happening is the gut is moving in a different way.

"I've spent years worrying my stomach feels weird despite doctors telling me there's nothing wrong with me. I think this video should get shown to everyone."

So I think it can be really transformative to help understand how all of your symptoms and problems are maybe interconnected to this one difference in connective tissue.

But what I've spoken about seems quite doom and gloom. I wanted to tell you a little bit more about some strengths that hypermobile neurodivergent people may have.

I mentioned about Simone Biles being in a class of her own. Well, after some conversations with a collaborator, a film director, Nigel Cole, who thought that many people in the film industry might be hypermobile and possibly neurodivergent, we did some research studies into creativity, and we found that in 250 people in the general population, hypermobility was associated with creativity because of neurodivergent characteristics.

So I just want to say this is a lot to process, but I want to say a huge thank you to all of the people who have helped me along the way, because this represents many years of work.

Professor Hugo Critchley, my dear mentor and PhD supervisor at Brighton and Sussex Medical School, really set me up on this path, and we continue to work together today both in research and in clinical practice.

Professor Kevin Davis, rheumatologist and professor of medicine. Dr. Lisa Quadt, who has been instrumental in working on many of these studies. Our dear nurse consultant at our neurodevelopmental service, Rebecca Dew, and Nigel Cole, the film director, for inspiring the creativity work.

And our collaboration with SEDSConnective, this charity that supports hypermobile and neurodivergent people. A big thank you to Jane Green.

And also, a massive thank you to all of the many funders and the literally thousands of people who have taken part in our research and all of the research staff at all of the facilities that we have used.

And I am launching a YouTube channel to promote this work, so please follow this link. Subscribe to my YouTube channel. It will be coming out over the summer. And if you go to my Linktree, which is just Bendy Brain, or my Instagram, @drbendybrain, you will find links to all sorts of papers, news articles, other webinars and podcasts. So there's lots of things to find out more.

Please subscribe to the YouTube channel. Follow me on X or Blue Sky. I'm @bendybrain, and @drbendybrain on Instagram. My Linktree is Bendy Brain.

SEDSConnective have lots and lots of important resources. And in the UK, we have something called the EDS UK GP Toolkit. Now, general practitioners are like family medicine doctors, but in the UK, they are the single point of access for specialist referrals. And the EDS UK GP Toolkit enables general practitioners, family doctors, to diagnose and manage hypermobility and associated problems, particularly postural tachycardia syndrome and an allergy issue called mast cell activation.

So the EDS UK GP Toolkit, and also, if you have a child who is struggling at school, the EDS UK School Toolkit talks about hypermobility.

A massive thank you to ADDitude for inviting me to give this webinar. I hope you found it interesting, and I think we're opening up for questions. But please do sign up and subscribe to my upcoming YouTube channel.

ADDitude: Thank you, Dr. Eccles. Before we start the Q&A, I'd like to share the results from today's survey, where we asked the questions that Dr. Eccles suggested because we wanted to know the percentage of the audience that could be hypermobile.

And in answering the questions, it looks like 69% of you may very well be hypermobile.

Dr. Eccles: Wow.

ADDitude: Yeah. And 31% likely not.

Dr. Eccles: So I just want to put a couple of caveats around that. In COVID, we had lateral flow tests to see if you had COVID, and it was possible that you did have

COVID, but you still had a negative test. It is possible that you could be hypermobile but not score two or more on those questions. I think men, in particular, are missed by those questions.

So if you have any flexible joints, particularly in things like hips, shoulders, ankles, prone to joint sprains, swellings, easy bruising, dislocations, please do go to your provider and ask for a hypermobility assessment.

And just because you don't score two or more doesn't mean to say that you're hypermobile. If you do score two or more, then you almost certainly are.

And some people with hypermobility, they have hypermobile Ehlers-Danlos syndrome, some people have one of the very, very rare Ehlers-Danlos syndromes, and some people have hypermobility spectrum disorder.

But hypermobility is much more common than we think. We know, in the general population, that it's 1 in 5, but in neurodivergent people, it seems to be just as you have shown in this webinar today, probably 70% or 80% of people. And that's just one way of measuring hypermobility. If we did a more thorough diagnostic assessment, we may pick up far more.

ADDitude: Wow. A lot of people are thanking you because they say this makes so much sense and they couldn't get this information anywhere else. But they've also said they've gone to different doctors and have found that the doctors don't know what they're talking about, or they don't have an understanding of this connection, or they're very dismissive. So what do you recommend patients should do to talk to their doctors about this connection and diagnosis and treatment?

Dr. Eccles: I think you raise a good point. People come to me, or they write to me, or they ask me questions, and they say, "Why is it that my doctor doesn't know about this condition? Why is it that my psychiatrist doesn't know about this condition?" And the thing is, the medical community and the scientific community, it normally takes about 10, 15 years for research to be easily translated into clinical practice.

And so although patient communities have been quite aware of some of these links for some time, the medical community is really playing catch-up here.

So what I would do is I would make them . . . I referenced the EDS UK GP Toolkit. That is an excellent resource for healthcare professionals. There is also a book called . . . It's a very long title, but it's essentially called "Understanding Hypermobility" by Claire Smith. I would consider ordering that and reading.

I would look at all of the links and the papers on my Linktree. In my Linktree, Bendy Brain, there's a list of all of our publications, and I would take copies of them to your doctor and explain that you're not making this up, that this

connection is real, and that there is a huge emerging research movement around this.

ADDitude: We also received a question from a clinician who said, "How can I be better at diagnosing and treating this?"

Dr. Eccles: Absolutely. So the Ehlers-Danlos Society . . . So if you just type in EDS Echo program, they run courses to train clinicians in hypermobility. So these are online virtual courses. It's called the EDS Echo program. And you can join a network of hypermobility-informed clinicians. Yeah, I would highly recommend the Echo program.

ADDitude: We have so many questions, so I'll just begin. Someone asks, "Are there biomarkers or cell signaling pathways that link ADHD with inflammatory conditions, chronic pain, anxiety, and joint hypermobility?"

Dr. Eccles: Yes, there is. I was sort of explaining, but without slides because it isn't data that we've properly published yet. We have found a gene expression link between hypermobility, chronic pain and fatigue, ADHD, and hypermobility. And we're presenting this at a big rheumatology conference in June.

So there is research, but it's very limited, and we need to get it out there. I personally think that this sort of finding should break the internet, but it won't. But hopefully we'll have it published in an open access journal soon, and we will be able to propel and encourage other researchers to continue to look into this link.

ADDitude: How do these conditions change over time and throughout the lifespan? Or do they?

Dr. Eccles: Oh, such an interesting question. So one of the hardest audiences that I have in general is pediatricians because a lot of children seem to be hypermobile. I work with adults, and by the time you're an adult, it's kind of quite clear whether you're still hypermobile or not.

Hypermobility and neurodivergence, they're both highly heritable. They run in families. They may well even kind of be inherited together, or the processes affecting the development of connective tissue are also affecting the development of the nervous system.

What we know is that hormones interact with connective tissue. So people who have been pregnant, for example, may have experienced this condition called pubic symphysis dysfunction, or pelvic girdle dysfunction. So we know that certain hormones make tissues laxer, and that is definitely the case with hypermobility.

We know that people say that in different phases of the menstrual cycle, their hypermobility symptoms and their ADHD and sometimes even autistic features are worse just before their period.

We know that as you get older, sometimes joints stiffen. And so you may not look hypermobile on the outside, but you're still experiencing lots of hypermobility-related features.

And if anyone's interested in finding out more about the influence of hormones and hypermobility in these conditions, in my Linktree you'll find a link to a podcast called the "ADHD Women's Wellbeing Podcast," where I talk about these things in a little bit more depth.

ADDitude: People are asking about diet and exercise. Are there specific diets or foods that people should eat or stay away from with these conditions?

Dr. Eccles: Well, I think there's so much more that we need to research and find out. And it may be that the intersection of hypermobility and neurodivergence, that there are effects on the kind of metabolic system and the way that we process certain foods.

But I think the real thing is that exercise has been shown to be quite helpful in ADHD. And now hypermobility, exercise can be problematic. I'm sitting here having subluxed an ankle tendon while sitting in my chair. But it is important to remain active but to have appropriate expectations.

So if you are a hypermobile person, don't immediately think, "I'm going to sign up for a half marathon." You've got to build up physical exercise gradually. And if you're struggling to build it down gradually, sort of energy accounting, physical accounting . . .

But yes, certain things like Pilates, core strengthening exercises, can be really helpful for hypermobile people. So if your middle, if your core, is stronger, that means you're less likely to have widespread pain problems like neck problems, back problems, shoulder problems.

And so I think that it is really important to keep active, but in the right way and not to overdo it and to be mindful of injury, but to really focus on improving your core stability.

ADDitude: A few people had asked about dry needling, if dry needling could help, that you would receive from a chiropractor.

Dr. Eccles: I'm afraid I'm not an expert in that sort of situation.

ADDitude: Okay. We had a few questions around hypermobility and healing. Some people said they were slower to heal from injuries or surgery. And is there a connection between slower healing and hypermobility?

Dr. Eccles: Yes. Absolutely. So we could talk about this sort of thing for a long time. So hypermobility is often associated with poor wound healing. The tissues are sort of stretchier, and they don't necessarily stick together so well. Hypermobile people often have these very thin, papery scars, which is actually part of the diagnostic criteria.

One of the things that can happen is hypermobile people, because their joints naturally have an extended range of motion, they could be being examined and they could have a significant problem in terms of their mobility, but it would appear that they still had a good range of movement.

Or they could have surgery, and it turns out that they're sort of compensating with other muscle, other joints that have a good range of movement, and that actually healing and recovering . . . And I know this from personal experience, having had a hip replacement at 36. You can kind of cheat in some ways in the short term, but that doesn't necessarily bode well for the long term. So yes, both in terms of wound healing and actual mechanical functioning, healing can be affected.

ADDitude: Does linking hypermobility and neurodivergence and autonomic dysfunction change any treatment recommendations for ADHD?

Dr. Eccles: Well, this is an interesting one. So the dysautonomia, the big one is the postural tachycardia syndrome. Now, lots and lots of our patients seem to experience problems with this. There are several reasons why people might have postural tachycardia syndrome, but one of the most common reasons is as I described, blood being in the wrong part of the body or not enough blood, like a blood volume problem, which you can improve with electrolytes and stuff.

ADHD medicine in the United States is often actually used to treat postural tachycardia syndrome, because some stimulants in some people have a vasoconstrictive effect. So they cause the blood vessels to constrict, which means that blood is more likely to get back to the heart, and then you're less likely to have some of the postural tachycardia problems.

Which for some clinicians sounds counterintuitive because they think, "Oh, I'm going to start a patient on stimulants. I'm worried they might develop tachycardia." It might actually paradoxically improve their tachycardia. But every patient is different, and you need to take advice from your medical professional.

What we've also noticed is that some of the techniques for helping with postural tachycardia syndrome . . . They include things like compression stockings and compression garments. They can help people feel so they have a better sense of who they are and that this can improve their emotion regulation.

It sounds really strange, but we've had patients who've been self-harming, then they've started wearing compression garments, and it seems like they're more in touch with their body. They have a better sense of the limits of their body and what their body is doing in space because of the feedback from the compression garments.

So I think that there are a lot of ways in which abnormalities of the autonomic nervous system, neurodivergence, and hypermobility interact.

I also remember when I was first reading about the autonomic problems that you get in hypermobility, reading about what was then talked about as flapping in autism, which we might think of as stimming and self-soothing behaviors. And it was actually hypothesized that some stimming behaviors may well be an attempt to regulate a dysregulated autonomic nervous system.

ADDitude: I'm still blown away by the compression stockings helping self-harm behavior.

Dr. Eccles: This is clinical findings. We haven't done a research study, but it is really interesting.

So I'm someone . . . I have ADHD. I'm AuDHD. I don't really feel like I exist properly unless I'm touching one other part of my body. I don't know if other people recognize that, but I'm sitting here cross-legged. I'm often touching my face, touching my fingers. There's something about the feedback of having one part of my body on my body that helps me feel grounded.

And I'm not going to purport to generalize this to the whole population, but I think, for hypermobile neurodivergent people, having a better sense of feedback about how the body is can make a huge difference.

We haven't touched on it at all in this webinar, but there is a relationship between hypermobility, neurodivergence, and this thing called interoception, which is the inner sense of what is happening in the body. And we could talk about that for hours. If you go to my Linktree, there is more information about it.

And we actually designed a new nondrug treatment for anxiety and hypermobility that's been shown to work in anxiety and autistic people that is about improving this sense of what's happening inside your body.

But if the compression stockings help return blood to the heart and you're less likely to feel heartbeat-y, brain fogged, dizzy, you can imagine that you might feel better. So patients come to me, and I've seen this on social media as well, saying . . . They really resonate with the statement, "Oh, I thought I was anxious, but actually it was too hot, and my clothes were too tight."

We really underestimate the power of the sensory environment in terms of our emotional feelings. And we often attribute discomfort or discombobulation to anxiety when in fact it's not because we're particularly worried or anxious in the cognitive thinking of anxiety sense, it's because there's something off in terms of our sensory system.

ADDitude: Wow. That's fascinating. We had a lot of questions around sleep issues, sleep disorders, sleep disturbances, and hypermobility. Is there a link? I know ADHD and sleep disturbances, there's a connection. Is that true with hypermobility too?

Dr. Eccles: Yes. Well, as far as I'm aware, there's a research literature linking hypermobility to sleep apnea. And you can imagine if you have a floppy gullet, that you might be more likely to have sleep apnea.

I have certainly seen in our Neurodivergent Brain-Body Clinic, several slim young men, who you would not expect to have sleep apnea, turn out to have sleep apnea, and that to be a contributing factor to their terrible insomnia and terrible fatigue.

ADDitude: Wow. Do you have recommendations for that, for treatment?

Dr. Eccles: Well, I'm afraid I'm not a sleep specialist, but if you think you're getting unrefreshing sleep and you are actually going to sleep . . . Some ADHD people really struggle to get to sleep at all. But if you think you are sleeping but you are maybe gasping or breath-holding in the night, then it would be worth trying to get a proper sleep study to see if you have sleep apnea or something similar.

ADHD people, insomnia and circadian rhythm problems are really a massive issue. Again, not in the diagnostic criteria, but it's actually very hard to find someone with ADHD who doesn't have some form of sleep problem. And we know that sleep problems make emotion regulation and everything else much more complicated.

So getting into good sleep habits . . . I mean, that's easier said than done, isn't it? But we often in clinic prescribe things like . . . In the UK, it has to be prescribed. It's not available in supermarkets. Melatonin and things like that. But I think there needs to be further research about the intersection between joint hypermobility, neurodivergence, and sleep.

ADDitude: We also have questions asking about hypermobility and migraine headaches. Is there an association? Can you talk a little bit about that?

Dr. Eccles: Yes, there is an association between hypermobility and headaches. And you can imagine that migraines are to do with blood being in the wrong place. And you can sort of see how the connective tissue vasculature situation could definitely be related to hypermobility.

So we are actively at Brighton and Sussex Medical School with Professor Hugo Critchley and colleagues . . . we are trying to set up some lines of research to look further into the relationship between hypermobility, neurodivergence, and migraine.

ADDitude: "Is there a connection between fibromyalgia and hypermobility?" someone asked.

Dr. Eccles: Oh, yes. So I touched upon it in one of the slides, and I've got some other presentations on my Linktree that will talk a little bit more about it. But we know from work that we did that 80% of people with fibromyalgia meet diagnostic criteria for symptomatic hypermobility.

I suspect that the vast majority of people with fibromyalgia actually are hypermobile. And hypermobility and fibromyalgia have been associated before the work that we did.

We know in fibromyalgia that people often have gut problems, dizziness. I think it's all . . . or I think it's not all, all of the time, but most of the time I think this could well be related to hypermobility.

ADDitude: Is there a connection between trauma and these conditions? A few people have asked.

Dr. Eccles: Do you mean childhood trauma?

ADDitude: Well, it doesn't specify.

Dr. Eccles: Or do you mean repeated trauma? Okay.

ADDitude: I think childhood trauma is . . .

Dr. Eccles: Yeah. So there is some really interesting research that shows that being a patient trying to get a hypermobility diagnosis, trying to be understood as a hypermobile person, induces clinician-associated traumatization. So the whole medical process in and of itself is traumatizing.

In terms of direct research linking hypermobility to emotional trauma, I don't think there is a huge amount, but there are two really interesting ways in which you can make that connection. So there is a big literature in fibromyalgia about adverse childhood experiences and fibromyalgia. Doesn't mean to say that they are the cause and the effect, but that they are definitely linked.

Now, I know with colleagues . . . Professor Helen Minnis in Glasgow has written a wonderful paper called "Double Jeopardy" about how if you are neurodivergent, you are more likely to be traumatized. So she started looking at children with very adverse childhood experiences and finding them a lot more of them than you would expect have ADHD or are autistic.

Now, what I hypothesize is not only if you are neurodivergent are you more likely to be traumatized, for example, by being bullied or not fitting into the right world or by family structures and things. But as a neurodivergent person, you are living potentially in this hypermobile body with this very finely tuned autonomic nervous system that predisposes you to fight or flight. I think you then process trauma differently. So it's a double jeopardy and a double whammy.

ADDitude: When you say process it differently, like more intensely?

Dr. Eccles: I mean in terms of the vivid feelings of hypervigilance. If you talk to some neurodivergent people, they have very vivid mental imagery. This is called hyperphantasia.

You can imagine how if you combine a body that has got a hair-trigger response because of these differences in the autonomic nervous system, you've got a brain that is reliving trauma in technicolor, you are feeling constantly on edge, and you're predisposed to anxiety, that is a recipe potentially for reliving trauma, experiencing flashbacks, and experiencing hypervigilance, all of which are hallmarks of post-traumatic stress.

ADDitude: Wow. Someone asks if you can test genetically for hypermobility.

Dr. Eccles: This is an interesting one. So it's like autism and ADHD. There are certain rare types. So something like Fragile X, which people often have autism, there is a single gene or a genetic reason for it. You have the same thing in hypermobility.

There are 13 or 14, it's under debate, types of Ehlers-Danlos syndrome. And all of them but one have clear genetic causes, so mutations in things like collagens and tenascins, these extracellular matrix proteins. The one that doesn't have a single genetic cause is hypermobile Ehlers-Danlos syndrome, and it is hypermobile Ehlers-Danlos syndrome that is the most common.

Now, my mother and I were featured in a public engagement event in London recently talking about ADHD. It was introduced by Professor Philip Shaw. And he talked about a day in which he saw three different women at different stages of their life, one 7, another 30, another 50. And he's like, "How can this all be?" And the answer was they were all in the same family.

ADHD and hypermobility are really as heritable as height, which is what he was saying about ADHD. If you have a family member who is hypermobile, it would seem highly likely that you will be hypermobile. But there are some rare occasions in which you may not have hypermobile family members and you are hypermobile.

ADDitude: We had a few questions around chronic pain issues. A woman writes, "My son is hypermobile. He has ADHD. He's been diagnosed with chronic pain disorder. It has severely impacted his quality of life. Do you have recommendations to help him navigate his days? He's 18 and he just finished his first year of college, and he's in constant pain."

Dr. Eccles: I think it's one of the biggest things that we see in the Neurodivergent Brain-Body Clinic, is this overlap between ADHD and pain. I think people with ADHD, they have a couple of things going on. They often want to run before they can crawl, they find it hard to say no to interesting things, and they can be all or nothing. Which means that if you are that type of person, trying to do pain rehab is really, really hard.

Trying to get some core stability work, like I was talking about with Pilates, and also some strengthening and heart-raising exercise is really important. But what we know for neurodivergent people, especially neurodivergent people who have just gone to college and are having completely . . . their schedule and everything is completely different, how to incorporate that sort of self-care into a routine is so hard.

Hypermobile people don't do well with opioids. We don't want people taking opioids for pain. We want people to . . . for their bodies to support them better and also for their brains and bodies to work well.

One of the big problems for ADHD people, and this is a big problem for me having recently subluxed an ankle and prolapsed disc, is you can hyperfocus and be sitting in the same position for ages. And that position is often not an ergonomic position. So really thinking, "How is it that I study? Am I hunched over a laptop? Should I be using a desktop? Is my chair the right height? Is everything adjustable?" These sorts of things should really be thought about. Have I got arch support in my shoes? Do I have flat feet?

We need to think about all of those things before thinking, "Is there a pill that's going to make this better?"

ADDitude: Unfortunately, that has to be our last question, but thank you so much for joining us today and for sharing your expertise with our ADHD community. We appreciated your time and your expertise explanations and your answers so much. It's been very illuminating for our audience.

Dr. Eccles: Well, thank you so much for inviting me, ADDitude. It's a real pleasure to speak to ADDitude listeners. And please do subscribe to the new YouTube channel and the Linktree Bendy Brain. So if you just type in Linktree Bendy Brain, it will take you to all of the things that I am involved in. But a massive thank you to all of my dear colleagues and collaborators.

ADDitude: Thank you so much, and thank you to today's listeners. If you would like to access the event resources, visit additudemag.com and search Podcast 560. The slides and recording are posted a few hours after each live webinar. And if you're listening in replay mode, simply click on the episode description.

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We hope to see you again this Friday for Solve My Problem, a live Q&A session on all things ADHD. And next week, don't miss our free webinar on how music affects the ADHD brain. That will be spectacular.

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Thank you, everyone. Really appreciate it. Have a great day.