



Airing Pain 154

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Paul Evans: This is *Airing Pain*, a programme brought to you by Pain Concern, the UK charity providing information and support for those of us living with pain, our family and supporters and the health professionals who care for us. Content for this edition of *Airing Pain* was recorded at the 2026 Annual Scientific Meeting of the British Pain Society, and we're grateful for their support in this. I'm Paul Evans.

Gary Macfarlane: We linked the experiences reported by their mothers when they were very young, and then when they were older children, young adults. Was there any link between these experiences and reporting chronic pain at age fifty? Yes, there was.

Vanda White: One of the things, particularly within our Ukraine collaborators, that's come out, is that they know that they still have high pain scores in their children, regardless of injury severity and regardless of the pain management that they currently have.

Caitlin Edgar: You have very experienced clinicians, but not necessarily clinicians that are experienced with children, and then you have a mass casualty event, and a sudden influx of a paediatric population into a clinical environment that is not necessarily experienced in dealing with that paediatric population.

Evans: It's been known since the 1990s that exposure to multiple severely stressful events in early life can cause a range of outcomes in later life. The Consortium Against Pain Inequality, CAPE, is a project that aims to improve our understanding of how adverse childhood experiences could impact vulnerability to chronic pain in adulthood. The consortium includes scientists, clinical researchers, pain specialists, epidemiologists, psychologists and people with lived experience of chronic pain. Tim

Hales is Professor of Anaesthesia at the University of Dundee. He's Principal Investigator of CAPE.

Tim Hales: If you're exposed to things like abuse and neglect, and various household challenges, and even external challenges like war and displacement, you might be more likely to develop poor health. Some of these outcomes are more likely than others. Particularly, psychiatric disorders are linked, as you might imagine, to exposure to these traumatic events in childhood. Like post-traumatic stress disorder, they heighten a variety of health outcomes.

But when we started CAPE, the evidence around pain was not particularly strong. So we've spent time looking at large population cohorts, and we've established that childhood adversity is indeed linked to adult chronic pain: people who have been exposed to higher levels of childhood adversity have a higher likelihood of reporting chronic pain when they're adults.

Evans: What sort of chronic pain outcomes are we talking about here?

Hales: That's a very good question. It's quite possible that some types of chronic pain conditions might be more likely to be exacerbated by early life experiences than others. If you look at the literature, there's very little literature on neuropathic pain, for example. That's one of the areas that will be really interesting as we move forward, is to look at the strength of the associations between different types of pain conditions. Maybe there are some pain conditions that are particularly vulnerable to exposures to stress in early life, and others that are less likely to be that vulnerable, and maybe are more explained by other immediate biological causes.

One of the interesting things that we became aware of when we were doing the project in CAPE is that many of our patient partners, people with lived experiences of both childhood adversity and chronic pain, one of the things that they had in common was fibromyalgia. Beyond the anecdotal information, there is actually research that supports a link between childhood trauma and fibromyalgia. We have looked at severe chronic pain, so severity of chronic pain is definitely linked to exposure. For example, Professor Gary Macfarlane did a study in the UK Biobank as part of CAPE, and showed that exposure to childhood trauma gives rise to more reporting of severe, widespread chronic pain. These are pain conditions that are disabling for individuals who suffer them.

Evans: Tim Hales. So, there have been several what are called case-control studies looking at the link between adverse childhood experiences and chronic pain. Gary Macfarlane, another member of CAPE, is Professor of Epidemiology at the University of Aberdeen.

Macfarlane: When we do these studies, we are worried about recall bias: that some people, particularly people who have developed a health condition, remember things better than other people. You have a health condition, you wonder what may have caused it, so you think about what's happened in the past. And actually, there's quite good evidence that people with health conditions are more likely to remember things in the past that have happened compared to people who haven't. Even though they've had these things happen to them, they forget, for example, about operations and hospitalisations. So we decided to approach it in a different way and focus on prospective studies. These are studies that follow children, adolescents and adults through life. You collect the information around the time that it's relevant.

Evans: I was looking at details of the 1958 cohort studies. Interesting to me, because I'm 1957, so these people are now sixty-eight years old.

Macfarlane: Yes.

Evans: They were spoken to when they were fifty. What did it tell you?

Macfarlane: We gathered some detailed information about their health, including about chronic pain, and then we linked that up to what their mothers had told us when they were around the age of seven, and then what they subsequently told us when they were young adults. We then had a look to see: was there any link between these experiences and reporting chronic pain at age fifty?

We found that yes, there was. People who had experienced adversity were more likely to report chronic pain at age fifty. We looked at various types of adversity, some more serious than others, but all of them were linked to the experience of chronic pain. So there we can rule out the role of recall bias, because people weren't recalling things far in the past, we were linking things that had been collected contemporaneously.

But then we asked the question: is it that adversity is just linked to poor health outcomes generally, or is there anything specific about chronic pain? Now, my laboratory scientist colleagues were very clear that there were pathways linking these experiences to pain, but I had to look at it from an epidemiological perspective. What we found was, I thought, quite interesting.

The two conditions that were most strongly linked to adversity in childhood were chronic pain and mental ill health. Other types of ill health were related, but not as strongly, and some types of ill health were not related at all. This study, I think for the first time, provided evidence that yes, there is something specific about chronic pain and mental ill health in relation to adversity. And of course, one of the things that we know is that chronic pain and mental ill health are quite intertwined anyway. Mental ill

health increases your risk of chronic pain, and having chronic pain affects your mental health.

Evans: I'm just thinking back to those late '50s, early '60s. Wasn't that long after the end of the Second World War. Their parents had been through it. I think rationing hadn't long ended. Now, I don't remember life being tough, but I think my parents probably found it tougher in that period than, say, I found bringing up my children. So how do you classify what is adversity when it was the general population?

Macfarlane: It ultimately comes down to people reporting their beliefs, but we took information from more than one source. For example, we took it from the parents, but it was primarily the mother. Also, some information came from school teachers at that time, so things like neglect, school teachers were asked, did this child exhibit features of neglect? Did anything suggest that they were not being looked after?

So, what we call a triangulation of evidence. We collect information from different sources, and we're looking at all different types. We are looking at the very serious end, physical and emotional abuse, we're looking at neglect. We're also looking at financial hardship. The mothers were asked on a week-to-week basis, do you have enough money to buy the essentials you need for your family? We're looking at a whole range of adversity.

The interesting thing is, we see associations with most of the adversities we look at, and I think one of our conclusions is that the important thing is the effect on the individual, rather than us saying, as this type of adversity has health consequences, and this type of adversity doesn't, it's likely to be the effect that it has on the individual.

Evans: Gary Macfarlane of the University of Aberdeen. Tim Hales, again.

Hales: We did not try to collect prospectively in the sense that we didn't investigate children while they were being exposed to these traumatic events. That raises a range of problems, as you can imagine.

We have got a young population group that we're studying who suffer from juvenile idiopathic arthritis. They're at University College London Hospital and Great Ormond Street Hospital. Those are young adults, so the exposures are more recent for them than in some of the population groups. So that's proving to be quite interesting. One of the things that we're asking there is: do people suffer more pain as a result of their juvenile idiopathic arthritis if they're exposed to more childhood trauma? Their recollections are likely to be, well, they're certainly more recent, whether they're more accurate or not, I don't know.

I think most of the work is sort of predicated on the idea that even in later life, you'll recall events that were severely traumatic. And that's certainly true, because we've also studied people at the other end of their life, in eighty-year-olds in the Lothian birth cohort of 1936, and we've looked at the impacts of childhood trauma in those individuals.

Of course, they all have one traumatic event in common, in that they lived through the Second World War, so that's also been very interesting. Actually, those individuals who are now in their late eighties have proven to be remarkably resilient. They're probably quite an interesting group of the people who I mentioned who've been exposed to traumatic events, but nevertheless have had long lives and have not succumbed to early mortality, which is much more likely if you've been exposed to more childhood trauma.

Evans: I wonder, is that because during the war years, after obviously the First World War, as well as that, and current wars, even, wars are more of a group thing. We're all in this together, boys.

Hales: Yeah, that's a good point. Actually, we did collect anecdotal insights from the participants in that research. We didn't lead them in terms of what we wanted them to talk about. We just left an empty box where we asked, was there anything they wanted to tell us about their experiences? A number of them wrote about the Second World War. Some of them, exactly as you say, said we just got on with it, and they were very stoic, but there were others who expressed extreme concern and fear when they heard bombers going over Edinburgh. I think that was in itself quite interesting, and we're publishing a paper on some of those more qualitative outcomes, which I think will be quite fascinating.

Evans: I remember talking to somebody quite a few years ago as a new factory opened in the village. He'd been a Japanese prisoner of war, and when he saw that flag go up, it caused him real, real problems. And I don't think he'd been aware of it before seeing that flag in the village.

Hales: Yeah, that's really interesting. Triggering is a major consideration, actually, when we're thinking about developing tools like questionnaires, to ask questions about these events in early life.

What you've raised there is an issue of reliving the traumatic experience when something is reminiscent of that experience. We were acutely aware of that, because our patient partners, many of whom had had lived experience of traumatic events in early life, unfortunately, they were very keen to help us avoid triggering in the wording of the questionnaire. That's something that we spent quite a lot of time trying to work around.

We've now developed a questionnaire, which we're getting validated, we're validating it in Generation Scotland in a large population cohort. The hope is that this questionnaire will be more sensitive to people's prior experiences, but also will be effective at collecting the information that we need to collect.

Ideally one of the biggest outputs, really, of CAPE would be to convert that into a clinical tool that could be used, because trauma-informed healthcare is still not realising its potential, despite the fact that the UK government and the devolved nations are keen to have trauma-informed care. I think most people can see the benefits of it, but currently we're at a bit of an impasse where healthcare providers don't want to ask the questions because they don't know how to, and they don't know what to do with the information, and patients are quite keen to talk about their experiences.

That's something that I've learned being in this project, is patients who've been exposed, or people in general who've been exposed to childhood trauma, are for the most part happy to talk about, maybe not in specific terms, but in general terms, what they think the consequences of those exposures have been in terms of their health outcomes.

Evans: Gary Macfarlane again.

Macfarlane: How do you apply the knowledge that we're gaining? From the work that we've done, we are now taking this forward in a new consortium. What we're doing now is to examine the medical records. In the United Kingdom, you can get access to anonymised medical records with appropriate checks and balances, so you can't identify individuals, but you can get access to medical records.

What we're looking at is to see: are there any patterns of consulting or things that are in people's medical records that would lead us to believe, firstly, there are some important signs of adversity, but also that these young people, older children, have presented to GP services with, for example, mental ill health or chronic pain.

Because what we're ultimately trying to do is to change someone's trajectory. You know, they're experiencing pain, which may become chronic pain earlier, and that may continue throughout their life. Are there some interventions that we could have as a young adult, as an older child, that could change that trajectory?

Evans: So, a child has had adverse experiences. If that were recognised at the right point, and I suppose that's very difficult as well, because of different agencies involved, but if it were recognised at the same point, in theory, maybe in practice, you could put in place the psychological help, the whatever other help there is, to put a block at where depression, anxiety, chronic pain might have occurred in the future.

Macfarlane: Yeah. That's absolutely right.

Sometimes my colleagues say, well, you can't avoid adversity happening, and that is true. One of the things that our research shows is that the really big risk factor is when multiple adversities are happening, and they're happening over time. My answer to that is that if you can intervene after some adversity, you still could potentially have some benefit by avoiding future adversities and giving people the psychological resources to interpret what's happening and to manage their symptoms.

And it may be that the sort of interventions that we're thinking about, psychological interventions, the like, could actually be quite light touch. In adults when we have these sort of interventions, they're often six-week courses of things like CBT, with the possibility of follow-up sessions or check-in sessions later. So that's the sort of thing that we could be looking at.

Evans: Gary Macfarlane. Tim Hales again.

Hales: Moving forward, I think what we need to do is we need to understand who's vulnerable, and that will involve a measure of some kind of biological change, and what we've spent a lot of time looking at is epigenetics.

Evans: Just explain what epigenetics is.

Hales: I think we all have a notion of what genetics is. We have the blueprint for our physiology in all of our cells, but that can be regulated by changing the chemical structure of the DNA. It doesn't change the sequence of the DNA, your genetic identity comes from your parents, but the way that genetic identity is read or used can be altered by environmental factors.

A very well-known one is smoking. Smoking changes the structure of your DNA in certain ways that are not good for health in later life, that's well understood. In fact, you can use this type of epigenetic analysis to determine how many packs of cigarettes somebody might have smoked during their time, and that's a well-worked-out analysis.

We believe that you might be able to do the same thing for childhood stress. We think that with the right analysis, we might be able to find marks on the DNA, changes in the DNA that have been caused by stressful exposures, and that might help us to identify those people who are at most risk.

Evans: It's like looking at a core of ice, in an iceberg or whatever, and being able to look through it and work out what the weather was doing at each stage in its development. It's similar to that, is it?

Hales: Yeah, absolutely. There's a good, good analogy. I mean, it's slightly different from that, in that that core of ice won't change. I suppose it could melt, but it won't change, whereas the upside of this type of work is that epigenetics can be modified later in life.

A change might be made in early life, but it might be that some other types of activities might be able to restore the epigenetic scenario closer to the one before that stressful event had happened, or compensatory changes might be possible. I think that's where the hope is. The idea is not okay, you've been exposed to this event and you're now destined to poor health. It's identifying that you've been exposed to these events, you have this vulnerability, but the hope is that we can do something about that.

One of the key things that's coming out as being obviously very good for your health and also good for chronic pain is exercise. Now, I would anticipate that exercise will be doing things to epigenetics that counteract some of these early events. It's things like that, looking for strategies that can help restore the epigenetics back to pre-stress event conditions, that's the idea.

Evans: That was Tim Hales of the University of Dundee. We heard how from the 1958 cohort study, researchers are working out how children who lived through the Blitz of the Second World War eighty-or-so years ago may or may not have developed chronic pain as a result of their adverse childhood experiences.

Now, as we are recording this edition of *Airing Pain* in mid-2026 the world is yet again in turmoil, with wars in Ukraine, Iran and Gaza, and natural disasters around the globe. Maybe you'd be forgiven for thinking that globally we're still not doing enough to protect our children going through what our grandparents and great-grandparents suffered.

However, research and learning does continue. Anna Gibby is a doctoral researcher based at the Centre for Pain Research at the University of Bath. Her research is into how living in low-resource and hard-to-access populations, such as war and natural disaster zones, impacts on paediatric pain. The study will include data in Ukraine, a cohort of children who were injured in the Turkey earthquake of 2023 and a population of Gazan children.

Anna Gibby: This is a population that isn't small, and, unfortunately, is at the moment growing. We've got 175 million children who are affected by a natural disaster each year, not necessarily injured, but affected. The last injury report that's just been released by Save the Children stated 50,000 casualties in children from 2020 to 2025, and we think that's an underestimation, because the reporting is not

consistent, it's not accurate, it changes from conflict zone to conflict zone. We know, for example, in Gaza there was a lot of data destroyed as part of military operations.

Evans: So, how do you translate that population data into help for the individual?

Gibby: The area that I chose to go into is in what we call a perceived social injustice appraisal, which is essentially the assessment of fairness. To what extent does the child get injured, experience pain, and go, oh, this is really unfair, I've been wrong done by, a lot has been taken away from me, and I don't see it getting much better.

I was very curious as to how that would operate maybe in these low-resource settings in these communities of children that were being injured, compared to maybe some of the data that we know from the States, where it might be very individualised. You might be the only person in your community who is experiencing this illness or this pain, or that kind of thing.

Evans: So, are you talking about how their trauma is affecting them now, or how it will affect them in years to come?

Gibby: We listen to our colleagues, our clinicians who work with these children, and I think, yes, we want to know down the line, and I think continuing data collection to see how this longitudinally develops is really important, but there's a call for better understanding the psychosocial factors that can be treated, intervened with, in the moment, especially when other factors that might be influencing pain, or managing pain, are less available.

For example, we know in regards to Ukraine that there's some limited resources for analgesia, but we also know that psychosocial mechanisms and interventions like distraction-guided imagery and things like that can mirror therapy for phantom limb pain, can also be really valuable in not completely getting rid of the pain, but managing the pain, and maybe, we hope, in the long term preventing those early painful experiences from leading to continuing pain, chronic pain, pain into adolescence and adulthood.

Evans: Anna Gibby of the Centre for Pain Research at the University of Bath. Her colleague, Vanda White, is researching paediatric pain, particularly major trauma injury, brain injury and post-concussion syndrome.

White: I am trying to understand what psychosocial variables might help us understand which children are more at risk of worse pain outcomes through their recovery process. I'm trying to understand that from the acute setting, when they're first admitted into the hospital, and then following up at that three-month mark, which we know is a high risk indicator of children and adolescents developing chronic pain, if they're still experiencing high pain at that stage.

Things that I'm interested in are things like post-traumatic stress symptoms and disruption to sleep. We know that there's quite a shared neurobiology with those factors within pain, and they're quite prevalent in acute hospital settings. So, it's identifying how they're interacting with these injured children over that course of time of recovery, and ideally being able to identify whether there's an at-risk population that we can identify early, to then have earlier management to try and prevent chronic pain setting in after the three-month period.

Evans: I would have thought that psychosocial effects are a given for children in a war zone, so it's a given that they are at high risk of developing chronic pain.

White: Very true. I think the gap we currently have is that, even in non-conflict environments, we know these factors are interacting with pain outcomes. The piece that is missing is making them recognised and important enough that they then become part of standard care within a trauma setting.

If you extrapolate, at the moment, trauma records, they do not routinely screen for sleep disruption, they do not routinely screen for early signs of post-traumatic stress symptoms. We know how these variables can interact with children's experiences of pain and of recovery, but if we don't identify them early, we cannot flag these children as higher risk.

We need to offer earlier management within that early period before we're at six months, one year, twenty-four months, thinking this child now has chronic pain, they have PTSD, they are not able to interact with their normal peers within life.

One of the things, particularly within our Ukraine collaborators, that's come out is that they still have high pain scores in their children, regardless of injury severity and regardless of the pain management that they currently have.

They know that there's other variables at play, but they do not have capacity to understand what they are and which ones are acting more than others on these pathways, and their outcomes. That's where we can come in and say, here's what we know with the current evidence base in a non-complex setting, and why we think they're important to consider in your population.

Hopefully from the research we're currently doing within those populations, we'll then be able to inform back that *these* are *this* significant in the population that we're seeing. It would allow us, hopefully, to suggest that when a child is admitted into your trauma centre, these are some of the questionnaires and screening tools that we can use early on, within the first few days, to start to identify within your patient base: Do we need to put an intervention in for sleep? Do we need to get Psych involved much earlier to be aware of these post-traumatic stress symptoms early on?

It's small steps like that about integrating those pathways and those assessment screening tools. The blood pressure measure, the temperature measure are so routinely done, but all of the psychosocial variables are really not, and they need to be.

Evans: Can you use research that's currently being done on childhood adverse experiences and the effect that those are having on later life in non-combat zones like the UK. Can you draw on some of that? And in fact, vice versa, will those researchers be able to draw on your research into combat zones?

White: You can have major trauma injuries, and they don't necessarily happen in conflict zones. And you can have adverse childhood experiences anywhere in the world. I think there's shared knowledge from both sides.

To your point earlier, it is quite commonsense that if you are in a conflict zone there is the potential that you are inadvertently exposed to many different adverse experiences, some shared and some different to more stable environments.

You could still be in a conflict zone and be in a family that has the adverse problems we see in non-conflict environments, whether that's your parents have divorced, but you're now in a war zone, or you are being bullied, but you're now in a war zone. At least from our experience, you sometimes also have those different factors, but now there's just different players that are involved compared to what you might see in the UK, for example.

Evans: Vanda White of the Centre for Pain Research at the University of Bath. Caitlin Edgar is a postdoctoral researcher in the Centre for Paediatric Blast Injury Studies at Imperial College London. She's a biomedical engineer working on improving mobility for children with limb loss, developing prosthetic technologies for low-resource settings.

Edgar: At the beginning of our collaboration for the Centre for Paediatric Blast Injury Research, clinicians across the spectrum of injury were brought together to produce the first Paediatric Blast Injury Field Manual, which has been translated into multiple different languages and delivered globally.

It was recognised that the pain management strategies that formed a part, a small part of that manual, could be built upon and expanded. The University of Bath completed that amazing piece of work, releasing an updated version of the Paediatric Pain Manual. This harnesses and actions existing knowledge, and is available to individuals in low-resource environments.

I think one of the main challenges in these environments is that you have very experienced clinicians, but not necessarily clinicians that are experienced with children. You have a mass casualty event and a sudden influx of a paediatric population into a clinical environment that is not necessarily experienced in dealing with that paediatric population.

These resources, such as the Blast Injury Field Manual, such as the Pain Manual, are brilliant ways for us to disseminate our findings back to those who need it.

Evans: Caitlin Edgar. Anna Gibby again.

Gibby: The way that we've set up our studies in Ukraine and in Turkey is that these are to be long-term relationships. We want to be going back to these populations and saying, how are you getting on? Let's see how you are five years out. Let's see how you are seven years out.

I've learned so much. For example, most of our measures are validated in English. So in eight-year-olds I used the Injustice Experience Questionnaire, but it's been validated in eight-year-old English speakers. Then I spoke to my Arabic colleagues, and I said, what's it like learning Arabic? At what age does it click, and do you feel like children might be able to understand? And it's a little bit older in Arabic.

It's not just a straight translation, it's okay, conceptually, does this make sense, does it translate.

We couldn't do it without our team on the ground.

Evans: Presumably in the war zones. What about their wellbeing?

Gibby: That's, again, something that we've really had to consider ethically. It's something that's asked in our ethical processes at the University of Bath, is how you're looking after these researchers.

In Gaza, we have medical students. In Ukraine, we have clinicians who are working in the main trauma hospitals. In Turkey, obviously the risk is lower in that it's not a live conflict zone, although the risk of earthquake is always there.

They've already got quite the job on their hands, they themselves are in this survival mode. There's very little we can do, but we do what we can.

We try our best to touch base with them as humans before the research, so it might be a WhatsApp message, it might be at the start of the meeting. How are things going? What's actually happening? Making sure that their version of the conflict is

translating in our conversations, and we're not just coming in with, well, I saw this on the news, and so this must be what's happening.

There's the pragmatics too. For example, we don't ask our researchers to travel to go and collect data, especially within a live conflict zone, because we know that that increases their risk of getting an injury themselves.

We couldn't do it without these clinical partners, we're very, very grateful.

Evans: That was Anna Gibby.

I remind you, as I always do, that whilst we in Pain Concern believe the information and opinions on *Airing Pain* are accurate and sound, based on the best judgments available, you should always consult your health professionals on any matter relating to your health and wellbeing. They're the only people who know you and your circumstances, and therefore the appropriate action to take on your behalf. Now, it's important for us at Pain Concern to have your feedback on these podcasts, so that we know that what we're doing is relevant and useful, and to know what we're doing well, or maybe not so well. So, do please leave your comments or ratings on whichever platform you're listening to this on, or the Pain Concern website, of course. It's painconcern.org.uk. And that'll help us develop and plan future editions of *Airing Pain*.

Last words in this edition of *Airing Pain*, first Tim Hales, and then Caitlin Edgar and Vanda White.

Hales: One of the important things that's come out of all this research is that not everybody is equally vulnerable. Having a childhood trauma exposure doesn't necessarily mean you're destined to have poor health outcomes. There are those who have been exposed who are remarkably resilient, and then there are others who, unfortunately, are quite vulnerable to these exposures.

I think that's what we're really interested in, trying to understand the differences, so that we can bring some predictive power. If somebody has had exposures and they have a particular, for example, biological marker, we might be able to identify them early on, and therefore intervene in some way in treatment.

Evans: I found our conversation very, very depressing, but uplifting in the fact that you're doing something about this very, very important and currently awful situation in the world.

Edgar: We always say we wish we weren't doing this job, you know. We don't want our jobs to have to exist, but they do. So, I do feel uplifted, because when I started my PhD five years ago, there was even less people working in this space. And now

I'm sat here today, coming to a pain conference as a biomedical engineer, which has completely opened my eyes and brought together collaborations. We're growing as a collaboration and as a centre, so uplifting in a depressing environment.

White: I think also that there's just a general consensus where we know that children in general are a vulnerable population, let alone children with major trauma injuries, and there is a unanimous effort internationally to recognise research and improve the outcomes, knowing that those children hopefully have long lives ahead of them. It is quite exciting in a way to be part of that journey where we can hopefully improve the outcomes for these kids, and from their experiences learn how we can better help them in the future.

Edgar: And they're so resilient. They themselves are incredibly inspiring.