



The work of the Drake Foundation has been crucial in pioneering research to reveal links between concussion and head impacts in sport and neurodegenerative disease, helping to change the future for athletes and society at large.

Deborah Johnson speaks to its founder, philanthropist James Drake, about the origins of the Foundation, its achievements to date, what more must be done and its ongoing efforts to push for change

Through a determination to make sport safer for players of all levels, and to broaden understanding of neurodegenerative disease in society as a whole, James Drake is truly making change happen.

With his Drake Foundation pioneering eight groundbreaking studies around concussion and head injury, mostly in rugby and football, all of which are helping to gather more evidence around the impact of repetitive head trauma, the onus has been firmly placed on the need for greater player safety.

And as a result of such new research, change is indeed beginning to happen, with both the RFU and FA introducing guidance around contact training and high force heading respectively, and clinical practice in rugby changing as a direct result of Drake Foundation research. With the significant gains made around knowledge of neuroscience in sport, the not-for-profit Foundation - established by philanthropist James Drake in 2014 - is now tackling another area in which greater research is needed through its pioneering Drake Intimate Partner Violence (IPV) Study.

More than £2.2million has been invested to date in funding the research which is helping to revolutionise knowledge of brain health, bringing together the brightest minds in science and enabling collaboration with sports clubs and governing bodies to help break new ground around head injury and its long-term impact. Continuing to pioneer the research and gather the evidence to inform thinking in policy and education and make change is, says James, the ethos of what he sought to create.

"As a Foundation, we see our role as being a catalyst in areas of science and medicine that are under-researched and under-funded," James tells NR Times.

"Once we connected a contact sport with neuroscience, that could never be reversed. It would catalyse from there onwards forever.

"We want to accelerate conversation and funding around head injury in sport, and now we want to do it on a wider front."

The origins of the Drake Foundation

As a keen rugby player, who grew up during Wales' 'golden era' of rugby and himself played as a schoolboy for Cardiff, James confesses the sport is a "fundamental" part of his life.

However, after rugby became professional in 1995, the change in the physical demands of the sport, yet lack of change in safety protocols, became a concern for James.

"It seemed to me that the impacts were becoming more severe, the players were heavier, they were fitter, stronger, leading to bigger impacts," he says.

"I really felt that safety standards might be travelling in the wrong direction. And I wasn't the first. Barry O'Driscoll resigned from World Rugby in 2011 because of this issue. And so I felt there must be something there.

"If someone said to me, before the watershed in 1995, was rugby a relatively safe game? Safety is always relative, so I would say yes, it was relatively safe. But if I was asked is elite rugby safe now? I'd have to say no, I don't think it is."

With a background of publishing scientific research and information through his publishing house, Future Science Group, he believed more must be done to connect

sport with neuroscience to gain a better understanding of what was happening to players' brains during contact in sport.

"I wanted to not only fund, but also pioneer studies of brain health, to gather evidence of what was happening in the brains of players over time, with the idea that this evidence could inform sporting protocols, which were not very good, to say the least," says James, who speaks proudly of how the Drake Foundation is named in tribute to his adoptive father who gave him his name.

"We want sport to be enjoyed safely by everyone. And this evidence can also inform our understanding of neurodegenerative diseases at a wider societal level.

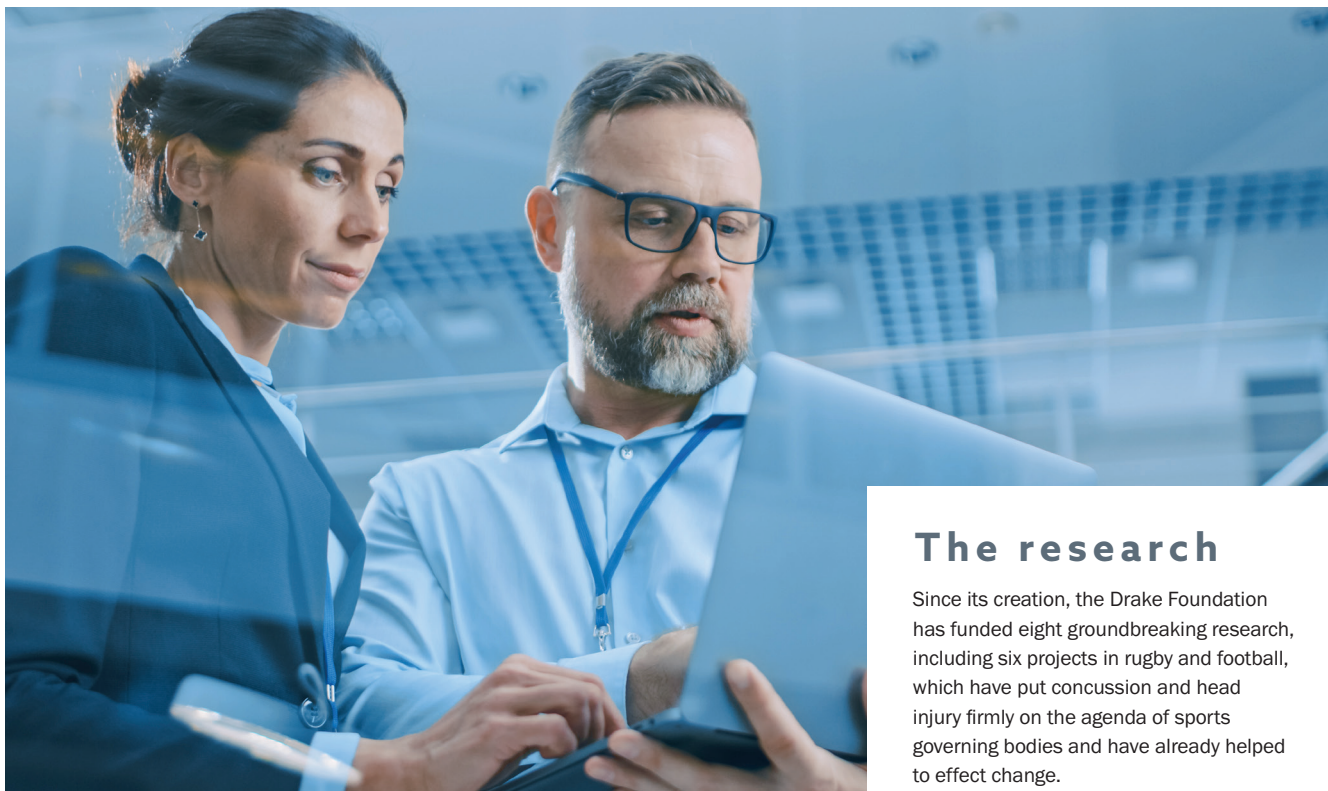
"I wanted to start the conversation about these vital issues in sport and society."

2014 became the year James decided to take action, following ongoing concerns around safety in rugby, the huge controversy around Tottenham Hotspur goalkeeper Hugo Lloris remaining on the pitch after losing consciousness - "I was just horrified by that," says James - and the coincidence of a Premiership rugby team relocating into the area where James lived.

"I'm a great believer in pointers in life," he says.

"You get these pointers, which are seemingly unrelated, but they're not unrelated. They're telling you something, and the fact that this club came to where I lived said to me, 'You've got to do this, mate'."

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The need for research

The concerns around safety in sport, alongside the rise of neurodegenerative disease in society as a whole, made James realise the need for research to help better understand this, and what could be done to protect against exposure to greater risk.

"This is a major problem for society as a whole, and I felt that there was a real gap in understanding what was happening in the brain long before diseases like Alzheimer's are outwardly visible," he says.

"Sports participants are one of the few groups where data can be gathered. The Framingham heart study in Massachusetts in the 80s advanced our treatment of heart disease enormously, but that sort of study for the brain just isn't possible.

"So we needed to learn more about what is happening in the brain, and that can only come through research."

While elite sport had undoubted capability in medical matters, the lack of knowledge in the field of neuroscience - particularly in sports like rugby and football, where head impacts are routine - was a big concern for James.

"The public would perceive that sport would know all about neuroscience. But of course, it's not the case," he says.

"World leaders in sports medicine knew all about typical sporting medical matters, but they knew very, very little about neuroscience.

"And I think, on reflection, my greatest contribution is to have linked neuroscience research with sport. Once we made that connection, they could never go back, because that ball starts rolling."

The use and understanding of 'concussion' was also something that was not awarded the seriousness it deserved, believed James.

"I felt that the word concussion was oversimplifying it - somebody's 'concussed' and then a few days later, they seem to recover, although you don't know what's happening in their brain now or in the future. It also doesn't account for all the sub-concussive blows that players are sustaining and which could be affecting their brain health," he says.

"I felt that in several sports, but particularly in rugby, you're getting multiple sub-concussions, and logic told me we have to prove that. We need evidence so you know that brain injuries have happened. We had examples of people with serious - likely sports-related - brain problems who had never been diagnosed with a concussion.

"And from a common sense standpoint, the brain needs better protection and prevention of impacts. People think wearing a helmet protects your brain - it protects your skull from being shattered, but it doesn't protect your brain, which is that jelly inside it. That just isn't acceptable."

The research

Since its creation, the Drake Foundation has funded eight groundbreaking research, including six projects in rugby and football, which have put concussion and head injury firmly on the agenda of sports governing bodies and have already helped to effect change.

Two of the most prominent - the Drake Rugby Biomarker Study and the BRAIN study - have both helped to show the need for urgent action to protect rugby players, with the former highlighting changes in brain structure that can be seen in elite athletes and BRAIN raising concerns around safety standards post-professionalisation.

The Drake Rugby Biomarker Study was the Foundation's first, launching in 2015, with blood, saliva and urine samples being analysed in an effort to uncover potential biomarkers of concussion injuries. The ongoing project continues to evolve, under the leadership of world-leading neuroscience experts including Professor Sir John Hardy, and more recently has used advanced neuro-imaging to break even more ground.

Linking up with a professional rugby club in 2014, the Drake Foundation committed to using research to get safety on the agenda.

"At that time, brain health in sport was hardly on the agenda. We didn't know what the research would show, we didn't know how the field would evolve," says James.

"But the neuro-imaging study would go on to change the landscape and led to an immediate change in the enhancement of clinical practice by the RFU, by setting up clinics for retired players. That was incredible."

The pioneering study would reveal that, from a cohort of 44 current elite rugby players, 23 per cent showed abnormalities to their white matter, or small tears in blood vessels, clearly demonstrating structural change to

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the brain. Furthermore, among the sub-group who underwent multiple scans, 50 per cent had unexpected shrinkage of the white matter in their brains.

While the RFU is, as a consequence of the findings, introducing provision to better support former players through a series of brain health clinics, James remains concerned as to why the statistics are not leading to greater levels of action across sport.

"Our study showed that 23 per cent of the small cohort had changes to the white matter in their brains – further research is of course required as we don't know the long-term effects, nor whether the changes may lead to any clinical symptoms, but nonetheless the response has been quite disappointing. When I've watched rugby, nobody has mentioned this thing. Nobody," he says. "If you put it in the context of the many reports of players in their 40s complaining about cognitive issues, and we have Stephen Thompson who has come forward with early onset dementia, then we're walking a bit of a plank. The fact these things aren't more discussed does trouble me.

"I talked to a top a cardiac surgeon and asked if there was any structural changes to the heart, would that just be accepted? He said of course it wouldn't. So I would argue that, just because we know less about the brain, why should it be acceptable here?" Its landmark football studies, the Drake Football Study - the most comprehensive study ever to measure the mental and physical health of professional footballers over time - and the HEADING project, which is working with retired footballers to investigate links between heading a football and neurodegenerative disease, will help to give new levels of evidence into the safety of football.



The response from football and rugby

While the Drake Foundation's research is undoubtedly leading to greater awareness of head injuries and more conversation around the topic, it has also given rise to some action, with the introduction of the RFU's brain health clinics.

World Rugby and the FA have also reacted to research into head impacts by introducing guidance around limiting contact in training in rugby to 15 minutes a week, and restrictions on ten high force headers a week in football - but the Drake Foundation, among many others, has been outspoken around the decision not to make this compulsory.

James is passionate in his belief that greater action is needed now.

"We've seen a big change in attitudes and a widening of the conversation, but I'm saddened that I still don't think (changes made to date) give it the seriousness it deserves to have. And I'm disappointed by that," he says.

"While we have seen these moves from World Rugby and the FA, I think you've got to make it mandatory at this time.

"My attitude would be don't just recommend the reduction of heading in training, that is ridiculous, you must make it mandatory.

"You also must look at the number of substitutes coming on, by all means substitute for injury or fatigue, but not by just bringing on 18 or 20-stone forwards to replace others when you're pacing tired players.

"You look at players like Stephen Thompson and realise the need for preventative action, common sense preventative action must be

taken now to protect players from potential harm - even if that harm isn't fully understood yet - and to stop this from happening to another generation of players, while we continue to carry out research into the exact mechanisms behind it.

"It shows that we need change now, we don't always need to wait for all the research to be published, as changes to the sport now will protect players and also the future of the sports." But the fact that change is happening, particularly in terms of how widely and regularly it is now discussed, is something that James is keen to welcome.

"We're really pleased to see the landscape changing and the growing of the conversation, including the Government now becoming involved in this important area, which is a good thing.

"We're also pleased to see that sports are making more positive changes to put player welfare first, including setting up advanced brain health clinics for retired players, using this the advanced neuro-imaging that was used in the Drake Rugby Biomarker Study. "Head impacts are becoming a bigger conversation, and that is good to see. Commentators do mention concussion and how serious it is, which is important as awareness and education are a huge part of tackling this issue.

"We're starting to see head injuries being discussed more in mainstream media and player communities now, rather than just the scientific and medical communities, and that is great to see.

"I think we're seeing also more support given to current and retired players in the elite rugby and football games.

"I'm pleased to see conversation in this area of growing, and it's now on the sport agenda. I'm quite certain that the work that Drake Foundation has done has helped to catalyse that."



The impact at grassroots level

While the increased awareness of the risks that participants of all levels face in contact sport is undoubtedly a positive thing, one area which is seeing the adverse impact of that is in grassroots rugby and football.

Research from the Drake Foundation has revealed that around two thirds of amateur rugby players, and the parents of youth players, are concerned about the long-term impact of rugby on their health, which raises concerns around the future of such sports. "Clearly, we have a problem our hands

here," he says.

"Our studies have been concentrated on elite rugby and football, so they're not directly extrapolated to the grassroots level, but people will take quite a lot from them.

"Our own market research has shown this, and there are many who are sadly pulling out of playing the sport of rugby or considering doing so.

"COVID has been absolutely devastating to children so the last thing you want to do now is to stop children playing sport. Really, it's essential to them."

James believes it is fundamental to see safety measures extended to all levels of rugby and football.

"It's good to see the changes being made in elite sport but that needs to translate across sport and through to grassroots level so that sport can be enjoyed safely by everyone.

"We're sports lovers, so we want to see a combined effort across research, as well as policy and education, to fast track our understanding of head injuries in sport, and mitigate against risks, so sport can be enjoyed safely by all.

"It's great that RFU are taking the lead in the professional game, but this does need to translate through to grassroots level to avoid the continuing drop out from youth rugby."



The focus on Intimate Partner Violence (IPV)

As part of its commitment to funding and pioneering research in under-represented areas, the Drake Foundation has thrown its weight behind efforts to better understand links between IPV and brain injury.

Already an area James believed deserved greater attention, his passion to lead research has only grown after an email from one survivor who expressed gratitude for his commitment to helping champion the cause.

"It's one of the most inspirational emails I've ever received. She's telling it from the heart, every word, and it's measured," he says.

"I think what makes me incredibly passionate about this is that it's not just women like the one who emailed me who are affected, but it's also the fact there are children sitting in the background who are inevitably damaged by this.

"It's horrible, because it's not just physical or emotional, it's also intimidation, which is a terrible thing."

The Drake IPV Study, led by Professor Willie Stewart - who has played a critical role in research to date around head injury in sport and neurodegenerative disease - will investigate changes in neuroimaging and cognitive test data in people exposed to domestic abuse,

to give a greater understanding of IPV-related head injury and how it can contribute to dementia risk.

"IPV affects probably millions of predominantly women, but also men too, across the globe. But we know very little of its long-term effects, and we know even less about its effects on brain health," says James.

"We hope this project will not only not only advance our understanding, but also will help to bring this sensitive but crucial issue to the fore in the hope of catalysing conversation, as well as increasing support and making positive change.

"I feel enormously strongly about this, based on that email and my own personal dealings. Through this study, it will give us hopefully a greater understanding of IPV-related head injury, as well as head injury in the population, together with an understanding of how such head traumas contribute to dementia risk.

"As with the excellent people we work with on our other research, we are very fortunate to work with outstanding people on this project. They are incredibly committed to this work and I'm so proud to be linking with these people. We couldn't have found a better partners, and it's always about the partnerships."

The future

While much has been achieved since the creation of the Drake Foundation in 2014, James acknowledges there is still much to do - but research lies at the root of making that happen. "More research is always needed. The brain is a very complex organ so it will take decades to fully understand it," says James.

"But to make change, you have to start.

For us, the first step was in going to a rugby club and persuading them to do a study, and that was a really hard one. The CEO said to me at the time 'The first step is the hardest thing' and it really was.

"You can provide money, but you need the commitment, the people and the collaboration to do this research and to lay the foundations.

"I'm very proud of what we have achieved, particularly in the connections we've made between sport and science. But we need to do more, and will do more."

Paving the way for the future of relationships between researchers, medics and governing bodies is the Drake Sports Head Impact Research Symposium, an annual event which brings together professionals working across all fields whose expertise can combine to effect change.

"This year was its biggest year to date, bringing together key individuals and organisations who can advance our knowledge in this area. This connecting of people is something I'm incredibly proud of, and one of our biggest achievements," says James.

This, and the ongoing commitment of those in a position to make change, will be key in the positive progress to date continuing, says James.

"There is a lot more to be done. I love sport and want to see it enjoyed safely at all levels," he says.

"So, into the future, alongside the research, I hope we'll continue to see more conversation and positive change to protect players and protect sport.

"Through doing so, I hope we will see some extrapolation of these results to help the community at large. That has been the ambition from day one, and continues to be so."

The Drake Foundation

* James Drake is the founder and chairman of The Drake Foundation, a not-for-profit organisation committed to funding research into head injuries in sport and beyond.

For more information visit www.drakefoundation.org