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Rugby health research goes global

Investigation of the long-term health of rugby players is soon to gain an international perspective, with the launch of a **Global Rugby Health Research Programme**. The programme consists of studies in New Zealand, the UK, Canada and Australia, making it the first of its kind.

The research is an expansion of the inaugural New Zealand *RugbyHealth* project, led by Auckland University of Technology (AUT), World Rugby and New Zealand Rugby. The study explored the long-term health impacts of playing rugby, producing valuable insights for the rugby community. The Global Rugby Health Research Programme will build on these findings, further assessing the impact of rugby history on general health and cognitive functioning.

The international programme of research will investigate the health of retired rugby players in multiple countries. Principal Investigators Professor Patria Hume of AUT (who led the foundation NZ study), Dr Doug King of AUT, and Dr Karen Hind of Leeds Beckett University are directing the research effort.

“This is a significant development for sport research. Taking the NZ *RugbyHealth* Project to an international level will address the growing public interest in the long-term health outcomes of playing rugby,” says Professor Hume. “We would like to know if the health outcomes found in New Zealand retired rugby players are also evident in other countries.”

The New Zealand study found that participants from the two rugby groups involved had sustained substantially more concussions than the non-contact sport group; 85% of elite rugby players and 77% of community rugby players reported having had at least one concussion, versus 23% of non-contact sport players. In assessing the neuropsychological health impact of rugby, it was found that players who experienced one or more concussions during their career experienced some cognitive limitations in comparison to players with no history of concussion (published in *Sports Medicine*, August 2016 – see the Notes for Editors for additional details). Brain excitability assessment also showed that elite rugby players had different corticomotor function, however there was no evidence that this was related to previous concussions (published in the *New Zealand Medical Journal*, January 2017).

The Global Rugby Health Research Programme is a significant follow up to the New Zealand study. The collaboration involves researchers from AUT University (NZ), Leeds Beckett University (UK), the University of Aberdeen (UK), the University of Regina (Canada), the

University of Victoria (Canada), HeadSafe (Australia), the University of Sydney (Australia), La Trobe University (Australia) and the University of Western Australia. Co-Principal Investigators will oversee research activity in each country (see the Notes for Editors for full details).

“In addition to applying the New Zealand project to their location, each country’s research team is also adding to the core general health and neurological health studies. This will allow us to gain important additional information – in particular on physiological biomarkers, brain health and bone health,” says Professor Hume.

Country-specific research projects

The UK Rugby Health project was the first expansion of the inaugural New Zealand Rugby Health project, and commenced in September 2016. It is investigating the long-term cognitive functioning and bone, joint, cardiometabolic and neurological health of retired rugby players. The study will use blood analysis, balance assessment, bone health, musculoskeletal health and brain health in-clinic tests. The UK Rugby Health project is jointly funded by AUT (as part of a strategic investment fund supporting the [Rugby Codes Research Group](#)) and Leeds Beckett University.

Last month Canada joined the research programme. Professor Patrick Neary (University of Regina) and Dr Steve Martin (University of Victoria) have begun recruiting participants to look at general health and cognitive functioning, plus clinical assessment of physiological biomarkers and brain health.

“The Global Rugby Health Research Programme is a unique opportunity for Canadian rugby and rugby worldwide to assess the effects of concussions in aging athletes,” says Professor Patrick Neary. “From this research we are hopeful that we will contribute to new knowledge that will help to make the sport of rugby in Canada safer for future generations of rugby players.”

The latest addition to the research collaboration came earlier this month, with Australia joining the programme. Dr Adrian Cohen (Headsafe), Dr Clare Fraser (University of Sydney), and Dr Alan Pearce (La Trobe University) are currently developing the ethics application for the study, to enable data collection for health and cognitive functioning research, as well as clinical assessment of concussion, physiological biomarkers, bone health and brain health.

While all the countries’ studies focus on rugby players, the Australian study is unique in its inclusion of athletes from Australian Rules Football, soccer, and equestrian, while the Canadian study includes retired ice hockey and American Football players. This will provide cross-sport analysis of the long-term effects of participation.

“We are delighted to announce that this important research has also been extended to Australia and to welcome our new collaborators to the team,” says Dr Karen Hind of Leeds Beckett University. “Our interdisciplinary approach is enabled by the breadth of expertise across the research team, and by expanding further on the international scale, we are achieving a greater representation of former-players and understanding of player welfare post-retirement across the globe.”

Dr Adrian Cohen is Co-Principal Investigator of the Australian study and founder of the not-for-profit Headsafe, an organisation that has been leading research into the short and long-term effects of concussion, using impact sensors, biomarkers and visual analysis, physiological technologies such as Transcranial Magnetic Stimulation (TMS), and sideline brain wave testing.

"This is the ideal opportunity to add past players from our part of the world to this landmark international research programme," he says. "The long term effects of participation in sport need to be understood and acknowledged in order that we can care for players today and into the future. Sport has so many positive benefits...let's increase our understanding to give participants - and their families - confidence that we are looking after them throughout their careers and after they stop playing".

Participation in the Global Rugby Health Research Programme

To take part in the programme's core tests of general health and cognitive functioning, retired rugby players and retired non-contact athletes from the UK and Canada (and soon from Australia) are invited to sign up via www.leedsbeckett.ac.uk/ukrugbyhealth. Participants will take the general health questionnaire (GHQ) and take part in an online neurocognitive test (CNS Vital Signs).

Additional clinic-based testing includes:

- United Kingdom – Leeds Beckett University: bone, joint and body composition evaluation by dual energy X-ray absorptiometry (DXA), tensiomyography and neuromuscular assessments, cardiometabolic examinations by blood test and electrocardiogram (ECG) and blood biomarker analysis. A functional neurovascular sub study will take place at Leeds Beckett University, the University of Regina Concussion Test Centre and the University of Victoria CARSA Injury Centre.
- Canada – the University of Regina and, once ethics approval is gained for the University of Victoria project: physiological testing to assess pre-frontal cortex oxygenation, using near infrared spectroscopy; electrocardiogram (ECG) to determine heart rate variability (HRV) changes; continuous blood pressure monitoring for blood pressure variability (BPV) changes; and recording of cerebral blood flow velocity using transcranial Doppler ultrasound to assess cerebrovascular reactivity.
- Australia – once ethics approval is gained for the Australian project, the University of Sydney will conduct clinical examinations, DXA bone scans will be provided by the 'Measure Up' mobile scanning units across Australia, and La Trobe University will conduct Transcranial Magnetic Imaging analysis.
- New Zealand – once ethics approval is gained for the extension project, blood biomarker analysis will be conducted with the University of Western Australia and AUT.

Details on how to participate are available at www.leedsbeckett.ac.uk/ukrugbyhealth.

ENDS.

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Notes for editors:

Participating organisations and Co-Principal Investigators

- New Zealand extension project: Associate Professor Gwyn Lewis, Associate Professor Alice Theadom (AUT University), Associate Professor Jacqueline Alderson and Professor Melinda Fitzgerald (University of Western Australia).
- UK: Ian Entwistle, Dr Michelle Swainson, Costas Tsakirides, Dr Antonis Stavropoulos-Kalinoglou, Professor Richard Aspden and Dr Jenny Gregory (University of Aberdeen).
- Canada: Professor Patrick Neary (University of Regina) and Dr Steve Martin (University of Victoria).
- Australia: Dr Adrian Cohen (HeadSafe), Dr Clare Fraser (Save Sight Institute, University of Sydney), Dr Alan Pearce (La Trobe University).
- Further Principal Investigators from other countries are welcome to contact Professor Patria Hume to discuss joining the Global Rugby Health Research Programme. Email patria.hume@aut.ac.nz.

The World Rugby/New Zealand Rugby/AUT NZ RugbyHealth Study

- The inaugural study commenced in 2013, and was funded by World Rugby, New Zealand Rugby and AUT.
- The neuropsychological health component of the study revealed that players who experienced one or more concussions during their career experienced some limitations in comparison to players with no history of concussion. These included being less able to understand and process information quickly, to make rapid decisions, to switch attention between tasks and to track and respond to information over long periods of time. Both the elite and community rugby groups studied performed worse on executive functioning and cognitive flexibility than the non-contact sport group. The elite rugby group also performed worse than the non-contact sport group on complex attention and processing speed. With the exception of reaction time, the average values for all three former player groups on all tests were within normal ranges provided by the CNS-VS age-matched normative database.
- For additional details of the study's findings, refer to the AUT Rugby Codes Research Group [webpage](#); the Sports Medicine paper, [A Comparison of Cognitive Function in Former Rugby Union Players Compared with Former Non-Contact-Sport Players and the Impact of Concussion History](#); and the New Zealand Medical Journal Paper, [New Zealand rugby health study: motor cortex excitability in retired elite and community level rugby players](#).

Useful links

- AUT Rugby Codes Research Group – www.sprinz.aut.ac.nz/areas-of-expertise/interdisciplinary-research/rugby-codes
The AUT Rugby Codes Research Group consists of international researchers who are collaborating to improve performance and reduce injury risk in rugby codes.
- Auckland University of Technology (AUT) – www.aut.ac.nz
- Leeds Beckett University – www.leedsbeckett.ac.uk
- University of Regina – www.uregina.ca
- University of Victoria – www.uvic.ca
- University of Aberdeen – www.abdn.ac.uk
- University of Western Australia – www.uwa.edu.au
- La Trobe University – www.latrobe.edu.au
- Save Sight Institute, University of Sydney – www.savesightinstitute.org.au

- Headsafe – www.headsafe.com.au
Headsafe is part of a not-for-profit charity dedicated to the elimination of preventable head and neck injuries through education, research, advocacy and awareness.
- King Devick Reading Test – www.kingdevicktest.com
- CNS Vital Signs Neurocognitive Test – www.cnsvs.com.