

Rugby Codes Research Group

e-Magazine

Issue 5 (March) 2018

Hume, P.A. Editor.

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RCRG website:

<https://sprinz.aut.ac.nz/areas-of-expertise/interdisciplinary-research/rugby-codes>



AUT SPORTS PERFORMANCE
RESEARCH INSTITUTE NEW ZEALAND



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WELCOME TO RCRG

Professor Patria Hume (RCRG e-Mag Editor 2012-2018)

Welcome to issue 5 of the Rugby Codes Research Group (RCRG) e-Magazine. The aim for the RCRG e-Magazine is to communicate advances in evidence-based knowledge and its practical application to the wider support network of rugby codes. In this issue we provide an update of rugby codes research projects by members. For example, the global expansion of the NZ rugby health research project into the Global Rugby Health Research Programme has led to improved international collaboration to understand the long term health implications of participating in rugby. The Rugby Research & Injury Prevention Group (USA) have been active in rugby injury epidemiology for Rugby-7s.



To ensure quality of research standards by the Rugby Codes Research Group members, the RCRG co-leaders request that all RCRG members read and work within this SPRINZ Code of Ethics for Members. All members must have a RCRG profile available on the RCRG website. Contact our new RCRG web master nicole.manuela@aut.ac.nz to submit or update your profile please.

We look forward to your continued work to improve performance and reduce risk of injury in the rugby codes.



Mission

- Holistic advancement of practice within the rugby codes via applied research.

Aims

- Bring together expertise that integrates areas of sport research (injury prevention, strength & conditioning, sport technology, coaching, psychology, physiology, performance analysis, leadership, management etc).
- Offer leading edge design and development solutions to rugby organisations, teams and players around the world.

RCRG History

The Rugby Codes Research Group (RCRG) was established in February 2009 based on the prior work in rugby related research of Professors Patria Hume and Will Hopkins and their postgraduate students – specifically Dr Ken Quarrie, Dr Simon Gianotti and Dr Doug King. Injury prevention and strength and conditioning were the original focus areas, with expansion into coaching, psychology, performance analysis, management and business in 2015. This exciting integrated approach means that knowledge across research areas is combined allowing effective holistic advancement of practice within the rugby codes.

The RCRG includes members from undergraduate to professorial level and national and international collaborators. The RCRG members includes epidemiologists, biomechanists, physiotherapists, medical doctors, emergency nurses, academic researchers and educators, students, coaches, players, and administrators.

RCRG MEMBERSHIP

RCRG co-Leaders and Roles

The RCRG co-leaders work together to help achieve the aims of the RCRG:

- Professor Patria Hume (AUT, Founder of RCRG, Professor Human Performance, Biomechanist, Kinanthropometrist, Injury prevention specialist, Injury epidemiologist)
- Associate Professor Lesley Ferkins (AUT, Sport Leadership & Management specialist)
- Associate Professor Nic Gill (All Blacks Strength & Conditioning Coach, Waikato University)
- Dr Doug King (Hutt Valley District Health Board, AUT SPRINZ Research Associate, Biomechanist, Kinanthropometrist, Injury Prevention specialist, Injury epidemiologist)
- Dr Matt Brughelli (AUT, Strength and conditioning specialist, Biomechanist)
- Dr Karen Hind (Leeds Beckett University, Physiologist, Kinanthropometrist, Injury epidemiologist)
- Dr Ken Quarrie (NZ Rugby, AUT SPRINZ Research Associate, Biomechanist, Injury Prevention specialist, Injury epidemiologist)

We welcome suggestions for areas of focus and leaders of initiatives.



Specific roles and responsibilities within the RCRG currently include:

- RCRG membership: Associate Professor Lesley Ferkins (Chair, AUT), Professor Patria Hume (AUT), Dr Doug King (Hutt Valley District Health Board, AUT SPRINZ RA)
- RCRG postgraduate liaison: Associate Professor Lesley Ferkins (AUT)
- RCRG e-Magazine editor: Associate Professor Nic Gill (Waikato University)
- RCRG grants: Dr Matt Brughelli (Chair, AUT), Associate Professor Lesley Ferkins (AUT), Dr Doug King (Hutt Valley District Health Board, AUT SPRINZ RA)
- RCRG web coordinator: Nicole Manuela (AUT SPRINZ research officer)
- RCRG media liaison: Susannah Dalton (AUT media), Ian Long (NZR)
- RCRG liaison with NZ Rugby: Dr Ken Quarrie (NZR), Associate Professor Nic Gill (Waikato Uni), Associate Professor Lesley Ferkins (AUT)
- RCRG liaison with NZ Rugby League: Dr Simon Mayhew (NZRL)
- RCRG liaison with World Rugby: Dr Ken Quarrie (NZR)
- RCRG Global Rugby Health Research Programme leaders: Professor Patria Hume (AUT), Dr Doug King (Hutt Valley District Health Board, AUT SPRINZ RA), Dr Karen Hind (Leeds Beckett University).

RCRG MEMBERS

We encourage new RCRG members. Please download a RCRG member profile from <https://sprinz.aut.ac.nz/areas-of-expertise/interdisciplinary-research/rugby-codes> to become part of the RCRG, or contact nicole.manuela@aut.ac.nz to be placed on the RCRG e-Magazine distribution list. If you have not yet provided a profile, please do, so we can highlight your rugby research related activities.

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Some of the SPRINZ student RCRG members

CURRENT MEMBER REMINDER: download a RCRG member profile from <https://sprinz.aut.ac.nz/areas-of-expertise/interdisciplinary-research/rugby-codes> and send to nicole.manuela@aut.ac.nz

CODE OF ETHICS



**AUT SPORTS PERFORMANCE
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This Code of Ethics was adapted from the Sport and Exercise Science New Zealand Code of Ethics, which was drawn up after consultation with the New Zealand Psychological Association, and was based, in part, on their Code of Ethics. <https://sesnz.org.nz/>

CODE OF ETHICS FOR MEMBERS

Membership of SPRINZ requires acceptance and compliance of this Code of Ethics for Members. The Code establishes a standard against which professional behaviour of SPRINZ members may be evaluated. Behaviour contrary to the advice of the Code amounts to behaviour against the best advice of SPRINZ. The Code will be used by SPRINZ in determining appropriate courses of action regarding complaints concerning the ethical behaviour of SPRINZ Members.

This Code covers all SPRINZ Members while engaged in a professional capacity – whether paid or unpaid. Members are expected to:

- maintain professional objectivity and integrity, and work within their scope of practice
- apply professional knowledge and skills to all work undertaken, and to refer clients* to other professionals/experts where necessary
- remain current with their knowledge of scientific, technical and professional information relevant to the services they offer
- respect the cultural and social environment in which they work
- hold the interests and welfare of their clients as primary importance and ensure informed consent is obtained from clients where necessary
- present opinions of their own in a fair, accurate and honest manner
- maintain accurate and current client records
- ensure ethical approvals are obtained from the appropriate bodies where necessary
- maintain professional indemnity insurance
- not fix or attempt to fix a match (or any part of a match) or use or reveal inside information for the purposes of betting.

Members should develop, maintain and encourage a high standard of professional training and competence. They accept they are accountable for their professional actions.

Members should readily provide information on professional qualifications and descriptions of services to help the public to make informed choices of the quality and type of services they can provide.

Members should be familiar with, and are expected to comply with, the requirements of New Zealand legislation (www.legislation.govt.nz), including but not limited to the following legislation and codes:

- New Zealand Sports Drug Agency Act 1994
This Act established the New Zealand Sports Drug Agency (Drug Free Sport NZ), and provides for testing for the use of drugs in sport, to encourage drug-free sport, and for related purposes (www.drugfreesport.org.nz). Members discourage the use of banned performance enhancing substances and banned doping methods, unless an athlete has a therapeutic use exemption (TUE). Members should co-operate fully with the athlete testing programme and not impede doping control officials.

CODE OF ETHICS cont.

- Privacy Act 1993
This Act outlines the Privacy Principles how "agencies" collect, use, disclose, store and give access to "personal information". The Health Information Privacy Code 1994 sets specific rules for agencies in the health sector to better ensure the protection of individual privacy. (www.privacy.org.nz)
- Consumer Guarantees Act 1993 and Fair Trading Act 1986
Under the Consumer Guarantees Act, consumer rights are expressed as a series of "guarantees" that a seller automatically makes to a consumer when they buy any goods or service ordinarily purchased for personal use. (www.consumeraffairs.govt.nz/for-consumers/law/consumer-guarantees-act)

The Fair Trading Act prohibits what is called "misleading or deceptive conduct, false representations and unfair practices". It also sets out when information about certain products must be disclosed to consumers and helps ensure products are safe. (www.consumeraffairs.govt.nz/for-consumers/law/the-fair-trading-act-1)
- Health and Safety in Employment Act 1992
The purpose of this Act is to promote the prevention of harm to all people at work, and others in, or in the vicinity of, places of work. (www.osh.govt.nz)
- Health Practitioners Competence Assurance Act 2003
The Acts purpose is to protect the health and safety of members of the public by providing mechanisms to ensure the lifelong competence of health practitioners. The Act builds on the framework created by earlier legislation, in particular the Medical Practitioners Act 1995. All the major concepts of the Medical Practitioners Act 1995 have been carried forward into the Act, adjusted where necessary to generic terms to provide a framework that can apply to all health practitioners' not just doctors. (www.health.govt.nz/our-work/regulation-health-and-disability-system/health-practitioners-competence-assurance-act)
- New Zealand Public Health and Disability Ethics Committees (HDECs)
New Zealand has a number of ethics committees, which were established under the New Zealand Public Health and Disability Act 2000. The primary role of the committees is to provide independent ethical review of health and disability research and innovative practice to safeguard the rights, health and wellbeing of consumers and research participants, in particular, those with diminished autonomy. (www.ethicscommittees.health.govt.nz)
- National Animal Ethics Advisory Committee (NAEAC)
This committee has been established under the Animal Welfare Act 1999 to provide independent advice to the Minister of Agriculture about ethical and animal welfare issues relating to the use of animals in research, testing and teaching, and recommendations on the restrictions of use of non-human hominids. (www.biosecurity.govt.nz/regs/animal-welfare/nz/naeac)

* Definition:

Clients Used as a generic term to refer to any person who is seeking professional services and/or advice from SPRINZ Members, regardless of whether a payment of a fee for this service/advice is received or not; is part of a research project as a participant; or an animal being provided a service from SPRINZ Members or involved in research.

Principal Investigators and Collaborators and focus of studies in each country include:



The Global Rugby Health Research Programme (GRHRP) resulted from international requests to expand the inaugural World Rugby/New Zealand Rugby/AUT NZ RugbyHealth Project, given the findings highlighted potential detrimental long term health outcomes for brain, cardiovascular and musculoskeletal health.

- New Zealand from 2013. Inaugural World Rugby/New Zealand Rugby/AUT NZ *RugbyHealth* Project (completed) - GHQ, CNSVS, balance and TMS studies. Extension projects GRHR collaborations, impact biomechanics. 2017-18.
 - Prof Patria Hume, Assoc Prof Gwyn Lewis, Assoc Prof Alice Theadom, Prof Denise Taylor, Dr Scott Brown, Liz Binns, Matthew Brughelli, Dr Doug King, Enora Le Flao & Joshua McGeown (AUT), Dr Ken Quarrie (NZR & AUT), Assoc Prof Stephen Marshall (Chapel Hill), Dr Rosamund Hill (Auckland Hospital), Stephen Kara & Mark Fulcher (Axis Sports Medicine).
- UK from 2016. GHQ, CNSVS, KD test, bloods, balance, tensiomyography, cranial NIRS, DXA, physiological biomarkers (ECG) to determine heart rate variability changes.
 - Dr Karen Hind, Ian Entwistle, Mr Costas Tsakirides, Dr Michelle Swainson, Dr Antonis Stavropoulos-Kalinoglou, Anick Sharma, Prof Clive Begg, Dr Peter Francis (Leeds Beckett University), Prof Richard Aspden & Dr Jenny Gregory (Uni of Aberdeen), Dr Madeleine Davies & Prof Nigel Arden (Oxford), Chris Nowinsky & Ann McKee (Harvard).
- Canada from 2017. GHQ, CNSVS, physiological biomarkers (ECG) to determine heart rate variability changes; continuous blood pressure monitoring for blood pressure variability, changes and cranial NIRS.
 - Prof Patrick Neary (University of Regina) and Dr Steve Martin (Victoria University).
- Australia from 2017. GHQ, CNSVS, KD test, bloods, DXA and TC MRI, impact biomechanics.
 - Dr Adrian Cohen (Sydney), Dr Clare Fraser (Save Sight Institute, University of Sydney), Dr Alan Pearce (La Trobe University), Jarrod Meerkin (MeasureUp), Dr Gary Slater (Uni Sunshine Coast), Assoc Prof Jacqueline Alderson (University of Western Australia), Prof Melinda Fitzgerald (Curtin University).
- USA from 2017. GHQ, CNSVS.
 - Max McKee-Proctor, Dr. Lyle Micheli & John Decker (Boston Children's Hospital).

GLOBAL RUGBY HEALTH RESEARCH PROGRAMME cont.

Some of the GRHRP collaborators:



Patria, Doug, Alice, Gwyn, Ken, Stephen



Denise, Scott, Rosamund, Matt, Liz, Jacqueline, Melinda



Karen, Ian, Costas, Michelle, Antonis, Richard



Richard, Jenny, Clive, Peter, Anick, Madeleine, Nigel



Patrick, Steve



Adrian, Clare, Alan, Jarrod, Gary

2017 HIGHLIGHTS

New Zealand Rugby and ACC introduce Community Based Concussion Strategy

The approach involved:

- policy change at the Provincial Union level with the implementation of the **Blue Card Initiative**;
- player education (standardized questionnaire and a 15 min educational presentation);
- completion of a pre-season concussion baseline assessment for players (modified SCAT5);
- engagement with health care providers; and
- establishment of concussion management protocol for players, schools/clubs, parents and provincial unions.

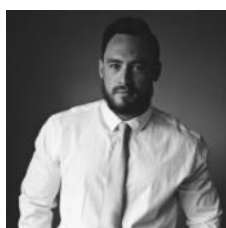
Some key results from standardized player questionnaire:

- 63% were aware of the GRTP guidelines regarding what a player should do if they are concussed;
- 70% identified the coach as the most common person to relay concussion guidelines;
- 94% identified the coach as the most common person to report their concussion;
- 71% said they would leave the field and get checked by someone with first aid knowledge or a team manager if they suspect they have been concussed;
- 81% ticked that concussion is a major injury;
- 97% ticked being concussed again while still recovering from concussion can result in more serious brain injury;
- 30% ticked they would not report a concussion because they



Post-season evaluation:

11 concussion injuries were reported with all players undertaking the full process ending with the GRTP. The main challenges identified from the pilot included engagement with teams and providing ongoing support. The trial relied on services of 1 x .5FTE and therefore placed considerable strain on project management. In 2018, we have increased capability through a masters scholarship programme where 5 x students will manage delivery and provide ongoing support in piloted areas. In addition, a research assistant will provide project support to the students and project lead. This has provided an opportunity to expand the pilot to a broader range of players and provincial unions. The aim this year is to provide a strategy that is feasible for communities to implement and validated in various demographic, social and ethnic diverse populations.



Isaac Carlson, BPhEd, Injury Prevention Portfolio Manager ACC | Isaac.Carlson@acc.co.nz



2017 HIGHLIGHTS cont.

Associate Professor Mike Hamlin

Lincoln University

“Completed collecting data on our concussion in Rugby union Study which involved following the Lincoln University Division 1 team throughout the 2017 season and collecting video, head-impact, GPS, biochemical, psychomotor, and psychological data on all games.”

Research Projects

- Association between Head Impacts, Tackle Type and Players Performance in Rugby Union (completed).
- The 1.2 km Shuttle Run Test versus the Yo-Yo Intermittent Recovery test: Relationship, reliability and player position sensitivity in elite rugby union players (completed).
- The Effect of a Yoga Intervention on the Physical Health of Rugby Players (completed).

Research Grants

- 2017 Ara Academic Research Committee Funding Grant \$9,360 (in collaboration with P. Olsen). Concussion and Rugby Research.
- 2017 Japan Sports Medicine Association for project entitled “Association between head impacts, tackle type and players performance in rugby union”, 1M Yen \$12,000NZD (in collaboration with Sohei Takamori).
- 2016 New Zealand Rugby Union for project entitled “Association between head impacts, tackle type and players performance in rugby union”, \$19,700



Research Publications

- Hamlin, MJ. Olsen, PD. Marshall, HC, Lizamore, CA. Elliot, CA. Hypoxic repeat sprint training improves rugby player’s repeated sprint but not endurance performance. *Frontiers of Physiology* Volume 8, Article 24 1-10, (2017), DOI: 10.3389/fphys.2017.00024
- Thuwakum, W. Hamlin, M.J. Manimmanakorn, N. Leelayawat, N.A. Wonnabussapawich, P. Boobpachat, D. Manimmanakorn, A. Low-load resistance training with hypoxia mimics traditional strength training in team sport athletes. *Journal of Physical Education and Sport*, 17 (1) 240-247, 2017, DOI: 10.7752/jpes.2017.01036
- Wonnabussapawich P, Hamlin MJ, Lizamore CA, Manimmanakorn N, Leelayuwat N, Tunkamnerdthai O, Thuwakum W, and Manimmanakorn A. (2017). Living and training at 825m for 8 weeks supplemented with intermittent hypoxic training at 3000m improves blood parameters and running performance. *The Journal of Strength & Conditioning Research* 31(12) 3287-3294, 2017.
- Boobpachat D. Manimmanakorn N. Manimmanakorn, A. Hamlin, M.J. Effects of elastic taping, non-elastic taping and static stretching on recovery after intensive eccentric exercise. *Research in Sports Medicine* 25 (2) 181-190 (2017), DOI: 10.1080/15438627.2017.1282360
- Thuwakum, W. Hamlin, M.J. Manimmanakorn, N. Leelayawat, N.A. Wonnabussapawich, P. Boobpachat, D. Manimmanakorn, A. Low-load resistance training with hypoxia mimics traditional strength training in team sport athletes. *Journal of Physical Education and Sport*, 17 (1) 240-247, 2017, DOI: 10.7752/jpes.2017.01036
- Raj, T. Hamlin, M. Elliot, C. The effects of an 8-week yoga intervention on hamstring flexibility and sprint performance of rugby players. *Sport and Exercise Science Annual Conference*. Cambridge, New Zealand, Oct 13-14, 2017; pp28.

2017 HIGHLIGHTS cont.

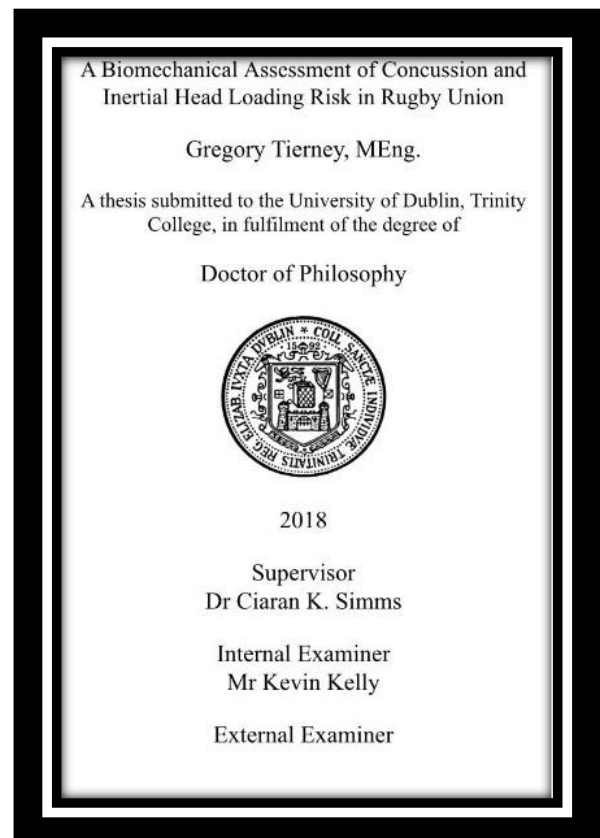
Dr Gregory Tierney

Trinity College Dublin

"Completed first draft of my thesis."

Research Publications

- Tierney GJ, Denvir K, Farrell G, Simms CK. The effect of technique on tackle gainline success outcomes in elite level rugby union. *International Journal of Sports Science & Coaching*. 2017. [Epub ahead of print].
- Tierney GJ, Denvir K, Farrell G, Simms CK. Does player time-in-game affect tackle technique in elite level rugby union? *Journal of Science and Medicine in Sport*. 2017. [Epub ahead of print].
- Tierney GJ, Denvir K, Farrell G, Simms CK. The Effect of Tackler Technique on Head Injury Assessment Risk in Elite Rugby Union. *Medicine and Science in Sports and Exercise*. 2017. [Epub ahead of print].
- Tierney GJ, Joodaki H, Krosshaug T, Forman JL, Crandall JR, Simms CK. Assessment of model-based image-matching for future reconstruction of unhelmeted sport head impact kinematics. *Sports Biomechanics*. 2017:1-15. [Epub ahead of print].
- Tierney GJ, Simms CK. The effects of tackle height on inertial loading of the head and neck in Rugby Union: A multibody model analysis. *Brain Injury*. 2017:1-7. [Epub ahead of print].
- Tierney GJ, Simms CK. Can tackle height influence tackle gainline success outcomes in elite level rugby union? *International Journal of Sports Science & Coaching*. 2017:1-6. [Epub ahead of print].



2017 HIGHLIGHTS cont.

Dr Mark Hecimovich

University of Northern Iowa

Current Research Projects

- Youth concussion in American Football, wrestling and soccer

Future Research Projects

- Stress and recovery in university men's and women's rugby



Youth footy study concluded in 2017 with impact sensors and K-D eye tracking.

Publications

- Hecimovich M, Marais I. (2017). Examining the psychometric properties of a sport-related concussion survey: A Rasch measurement approach. *BMC Research Notes*, 10 (28). doi:10.1186/s13104-017-2559-z
- Hecimovich M, King D, Garrett T (2017). Accelerometric analysis of head impacts in amateur wrestling: An exploratory analysis. *International Journal of Wrestling Science*, 6 (2):117-126. doi: 10.1080/21615667.2017.1315842
- King D, Hecimovich M, Clark T Gissane C. (2017). Measurement of the head impacts in a sub-elite Australian Rules football team with an instrumented patch: An exploratory analysis. *International Journal of Sports Science and Coaching*, 12 (3):359-370. doi: 10.1177/1747954117710512.

Dr David Kieser

University of Otago

"Sohei Takamori's superb study into multiple facets of head injury in the Lincoln first division rugby team. Still a lot of work to do but Sohei is a very dynamic and exciting orthopaedic surgeon who is performing some very interesting research."

Research Projects and collaborators

- Lincoln University
- SPRINZ
- Swansea University

Publications

- King DA, Hume PA, Gissane C, Kieser DC. Impacts to the head from match participation in women's rugby league over one season of domestic competition. *Journal of Science and Medicine in Sport*. 2018; 21:139-146.



2017 HIGHLIGHTS cont.

Dr Doug King

Hutt Valley District Health Board, AUT SPRINZ Research Associate



Publications

- Hecimovich, M., **King, D.**, Dempsey, A. & Murphy, M. Head impact exposure in junior and adult Australian football players. *J Sports Med.* 2018. In print
- **King, D.**, Hume, P., Hardaker, N., Cummins, C., Gissane, C. & Clark, T. Sports related injuries in New Zealand: National insurance (Accident Compensation Corporation) claims for five sporting codes from 2012 to 2016. *Br J Sports Med.* 2018. In print
- **King, D.**, Hume, P. Cummins, C., Clark, T. & Gissane, C. Concussion incidence for two levels of senior amateur rugby league in New Zealand, 2008-2011. *Sports Med Rehab J.* 2018. In press
- King, D., Hume, P. & Tommerdahl, M. Use of the Brain-Gauge somatosensory assessment for monitoring recovery from concussion: A case study. *J Physiother Res* 2018. 2(1):13
- King, D., Hume, P., Gissane, C. & Clark, T. Measurement of head impacts in a senior amateur rugby league team with an instrumented patch: An exploratory analysis. *ARC J Res Sports Med* 2018. 2(1):9-20
- Cummins, C., King, D. & Clark, T, Injuries in New Zealand amateur rugby league matches by positional groups. *NZ J Sports Med*, 2017. 44(2): 66-70
- Hume, P., Quarrie, K., Carlson, I., King, D., Bradshaw, E., Le Flao, E., Alderson, J., Theadom, A., Lopez, V., Lewis, G., Hind, K., Entwistle, I., Brughelli, M., Gissane, C. & Clark, T. Can we reduce injury in rugby codes? *J Sci Med Sports*, 2017. 20(Supp3): 1
- King, D., Hume, P., Gissane, C., Kieser, D. & Clark, T. Impacts to the head from match participation in women's rugby league over one season of domestic competition. *J Sci Med Sports*, 2018. 21(2): 139-146
- Cohen, A., King, D. & Pearce, AJ. Using neurophysiological measures to assess concussion. A case control study in one player. *Br J Sports Med*, 2017. 51(11): A11-A12.
- Cohen, A., King, D. & Pearce, AJ. Impact monitoring and King-Devick ocular testing provide a relatively simple process for objectively identifying and managing concussion in sports participants. *Br J Sports Med*, 2017. 51(11): 81.
- Clark, T., & King, D. Incidence of training injuries in a New Zealand amateur rugby league team over three consecutive years. *J Aust Strength Cond*, 2017. 25(7):26-32
- King, D. Book Review: RESTQ: The Recovery-Stress Questionnaires User Manual. *NZ J Sports Med*, 2017. 43(2): 64
- King, D., Clark, T., Kellmann, M. & Hume, P. Stress and recovery changes of injured and non-injured amateur representative rugby league players over a competition season. *NZ J Sports Med*, 2017. 43(2); 57-63
- King, D., Hume, P., Gissane, C. and Clark, T. Semi-professional rugby league players have higher concussion risk than professional or amateur participants: A pooled analysis. *Sports Med*, 2017. 47(2):197-205.



2017 HIGHLIGHTS cont.

Professor Patria Hume

Auckland University of Technology

Projects

There have been a number of collaborations as indicated in this e-mag. It has been a pleasure to work with, and promote the work of, members of the RCRG. My focus is the continued collaborations focused on brain health and injury mechanics in rugby.

“Keynote at the Sports Medicine Australia Conference, on behalf of many members of the RCRG.”

SPORTS MEDICINE AUSTRALIA

Professor Patria Hume PhD FISBS

Can we reduce injury risk in rugby codes?

With collaboration of Rugby Codes Research Group members:

Dr Ken Quarrie^{2,1}, Isaac Carlson^{3,1}, Dr Doug King¹, Dr Elizabeth Bradshaw^{4,1}, Enora Le Flao¹, Associate Professor Jacqueline Alderson^{5,1}, Dr Alice Theadom¹, Associate Professor Gwyn Lewis¹, Dr Karen Hind⁶, Ian Entwistle⁶, Dr Matt Brughelli¹, Professor Conor Gissane⁷, Mr Trevor Clark⁸, Dr Victor Lopez⁹

¹Auckland University of Technology ⁶Leeds Beckett University
²New Zealand Rugby Union ⁷St Mary's University
³Accident Compensation Corporation ⁸Australian College of Physical Education
⁴Australian Catholic University ⁹Rugby Research and Injury Prevention Group, USA
⁵University of Western Australia

AUT UNIVERSITY SPORTS PERFORMANCE RESEARCH INSTITUTE, NEW ZEALAND
 AN INSTITUTE OF AUT UNIVERSITY

Publications

Examples of rugby related publications not listed elsewhere in this e-Mag include:

- Quarrie, K., Brooks, J., Burger, N., Hume, P. A., & Jackson, S. (2017). Facts and values: On the acceptability of risks in children's sport, using the example of rugby. *British Journal of Sports Medicine*, 51, 1136–1141.
- Lewis, G. N., Hume, P. A., Stravric, V., Brown, S., & Taylor, D. (2017). NZ Rugby Health study: Motor cortex excitability in retired elite and community level rugby players. *New Zealand Medical Journal*, 130(1448), 34-44.
- Hume, P. A., Quarrie, K., Carlson, I., King, D., Bradshaw, E., Le Flao, E., et al. (2017). *Can we reduce injury risk in rugby codes?* Langkawi, Malaysia.
- Reid, D., Hume, P. A., Theadom, A., Whatman, C., & Walters, S. (2017). *Knowledge and attitudes (KA) surveys on concussion in sport. Report to Accident Compensation Corporation.* Sport Performance Research Institute New Zealand.
- Ferkins, L., Hume, P. A., Brughelli, M., & Dee, K. (2017). *Rugby codes research group SRIF year-end report – January 2017: Report to AUT Research and Innovation Office* Sport Performance Research Institute New Zealand.
- Brughelli, M., Le Flao, E., King, D., Hume, P. A., Haemmerle, E., & Perera, A. (2017). *Project 2. Neck Strength – SRIF RCRG project final report to SPRINZ.* Sport Performance Research Institute New Zealand.
- Hume, P. A., Burkett, B., & Whittington, C. (2017). *Project 3. Rugby Prosthetics Athlete – SRIF RCRG project final report to SPRINZ.* Sport Performance Research Institute New Zealand.
- Hume, P. A., Theadom, A., Lewis, G., Hind, K., Entwistle, I., & King, D. (2017). *Project 5. UK Rugby Health – SRIF RCRG project final report to SPRINZ.* Sport Performance Research Institute New Zealand.
- Bradshaw, E., Hume, P. A., King, D., Mayhew, S., Bloomfield, P., & O'Connell, B. (2017). *Project 6. Rugby Head Impact – SRIF RCRG project final report to SPRINZ.* Sport Performance Research Institute New Zealand.
- Hume, P. A., & Alderson, J. (2017). *Project 7. Rugby Digital Athlete – SRIF RCRG project final report to SPRINZ.* Sport Performance Research Institute New Zealand.
- Hume, P. A., & Iwamoto, S. (2017). The relationship between injury frequency, performance and body composition in rugby players: Progress report to AUTEK.

2017 HIGHLIGHTS cont.

Dr Karen Hind

Leeds Beckett University

UK Rugby Health Project Update

- We are over mid-way through data collection and have had a fantastic response from UK-based retired rugby players. Almost 100 former players are through clinic-based testing and over 200 have completed the online GHQ and CNSVS.
- Rugby Health PhD candidate Ian Entwistle successfully passed his Annual Progression interview in October 2017.
- Rugby Health MSc student Anick Sharma, with support from the UK Rugby Health team and Professor Patrick Neary, has completed data collection for the functional NIRS study where oxygenated and deoxygenated blood flow to the prefrontal cortex has been examined in response to various stresses in former players with concussion history and non-contact athletes with no concussion history.
- The preliminary bone density results will be presented at the International Society for Clinical Densitometry (ISCD) annual conference in Boston, 28th Feb - 3rd March 2018. The ISCD is the leading organisation for quality and excellence in bone densitometry and we expect the conference to be well attended. The bone density results so far have been surprising in that 1/3 of former players aged over 50 years were osteopenic or osteoporotic. This will be explored further once we have control data in and once we have analysed data on post rugby exercise habits.



Research publications

- Entwistle, I., Hume, P., Francis, P., Hind, K. Vertebral body abnormalities on bone density scans in younger and older retired rugby players: the UK Rugby Health project.
- Entwistle, I., Hume, P., Francis, P., Hind, K. Bone density in younger and older retired rugby players: Preliminary findings from the UK Rugby Health project.

Media

- Karen Hind featured on the BBC One Show discussing the UK Rugby Health project 31st August 2017.
- Ian Entwistle and Karen Hind featured in a 'concussion' documentary with former player Tom May, in July 2017.



Global Rugby Health Research Programme UK

- Research ethics have been submitted by Clare Fraser, University of Sydney. Harvard University are currently in the process of setting up for GHQ and CNSVS data collection. Fiona Wilson, Trinity College, Dublin is extending the GHQ to former Irish players. Karen Hind and Ian Entwistle will be travelling to Boston next week to meet with Will Meehan from Harvard University and Chrsi Nowinsky and Ann McKee from Boston University.

2017 HIGHLIGHTS cont.

Dr Sarah-Kate Millar

Auckland University of Technology

“Completed data collection with U18 and U20 boys about psychosocial development. Initial findings were presented at the meeting of Professional Association of Athlete Development Specialists.”



Research Publications

- Keung, S., Millar, S., Ioane, J., & Kidman, L. (2017, June). Te pou hinengaro o 'Te Iwi Kiwi': Senior elite New Zealand rugby league players' and coaches' perceptions of psychosocial development. Paper presented at the meeting of Professional Association of Athlete Development Specialists, Daytona Beach, FL.

Natalie Hardaker

ACC

“Enrolling in a PhD!” & “ACC TBI Strategy action plan is in place. IP to deliver concussion work as part of the strategy.”



Current Research Projects

Sex differences: the impact of the female physiology on injury risk and recovery in sport.

Publications

- King, D., Hume, P. A., Hardaker, N., Cummins, C., Gianne, C., & Clark, T. (2018). Sports-related injuries in New Zealand: National Insurance (Accident Compensation Corporation) claims for five sporting codes from 2012 to 2016. *British Journal of Sports Medicine*.
- Hume, P. A., Carlson, I., & Hardaker, N. (2014). Concussion guidelines introduction: Safeguarding against concussion harm - launch of the ACC Sport Concussion Guidelines. *New Zealand Journal of Sports Medicine*, 41(2), 61-66.
- Hume, P. A., Carlson, I., Hardaker, N., & al., e. (2015). *Sport*



Professor Melinda Fitzgerald

Professor of Neurotrauma, Curtin Health Innovation Research Institute, Curtin University and the Perron Institute.

“The completion of recruitment for our concussion study.”

Current Research Projects

'Identification of biomarkers that correlate with clinical features and outcomes following concussion'. Conducted through Royal Perth Hospital.

Chief Investigators:

- Prof Melinda Fitzgerald, Curtin Health Innovation Research Institute and the Perron Institute
- Prof Daniel Fatovich, Royal Perth Hospital and UWA
- A/Prof Carmela Pestell Robyn Winkler Clinic, UWA.

We have also gained funding to support biomarker and MRI assays using the bloods from the concussion study:

- Perron Institute internal grants scheme.

Publication

- Halstrom, A., MacDonald, E., Neil, C., Arendts, G., Fatovich, D. and Fitzgerald, M. (2017) Elevation of Oxidative Stress Indicators in Plasma Following Traumatic Brain Injury. *J Clin Neurosci*. 35: 104.

2017 HIGHLIGHTS cont.

Dr Victor Lopez Jr.

U.S Rugby 7's North American RISE Rugby Project in Injury Surveillance
Director, Rugby Research and Injury Prevention Group, Inc, affiliated with Hospital for Special Surgery, NY, USA



“Attending major events across the U.S. and now expanding across North America. The RRIPGs Rugby Injury & Safety Evaluation (RISE) methodology dataset, has the ability to analyze the many factors of U.S. Rugby-7s in detail. The impact of this data, will answer questions whether these biomechanical injury concerns are exclusive to North America or are they symptomatic of developing rugby markets in general? The results of this study provide much needed data on Rugby-7s in emerging countries, such as the U.S. This is our most recent analysis capable of yielding an impact in the clinical literature on Rugby-7s.”

Research Publications

- Lopez V, Jr., Ma R, Weinstein MG, Hume PA, Cantu RC, Victoria C, Haleem S, DeLallo JF, Allen AA. *Assessment of risk factors involved with contact and non-contact injuries in U.S. Rugby-7s.* Br J Sp Med. February 2017, 51 (4) 352; <http://dx.doi.org/10.1136/bjsports-2016-097372.173>
- Lopez V, Jr., Ma R, Weinstein MG, Hume PA, Cantu RC, Victoria C, Haleem SY, DeLallo JF, Allen AA. *Biomechanical influences in injury rates of U.S. community Rugby-7s: Contact versus Non-Contact injuries.* J Sports Sci. December 2017. 35 (S1) s1–s113. <https://doi.org/10.1080/02640414.2017.1378421>

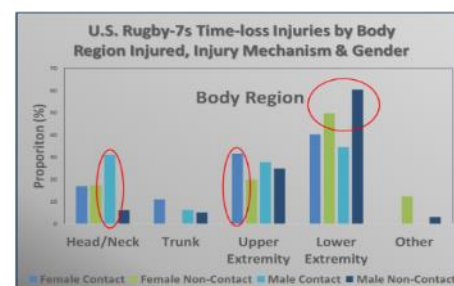
Current Research Project

This study is the first to analyze injury mechanisms in the new format of Rugby-7s in an emerging rugby population. Due to the frequency of contact inherent in rugby, including the tackle, techniques in contact must be evaluated as an area for injury prevention. Knowing the injuries with increased amount of side-stepping, deceleration and acceleration, which increases the risk of non-contact injuries in open-play, will be injury preventive. Understanding injury mechanisms in this new format of sport, will understand the increased injury risk with style of play, to aid in the translation of the sports injury prevention cascade (van Mechelen *Sp Med* 1992, Finch *JSciMedSp* 2006, Bahr *BJSM* 2005).

Results included: Contact injuries (54%; n=823) occurred more often than non-contact (46%; n=697; <0.001). Medical attention injuries (contact=30.4/1000ph; non-contact=29.2/1000ph; P<0.001). Time-loss injuries (contact = 23.8/1000ph; non-contact = 16.7/1000ph; P<0.001). Days absent were frequent among 68.4% with follow-up data: Contact = 40.1 days; CI: 33.6-46.7; Non-contact = 46.7 days; CI: 34.1-59.4. Genders: differences as shown in the graphs. Upper extremity injuries (incl. both mechanisms), due to the tackling and collision nature of Rugby-7s (Fuller *CJSM* 2010, Lopez *AJSM* 2012 & *OJSM* 2014).

- Head/neck contact injury rates higher and more severe (31%; 45d) than international elite male Rugby-7s (5%, 18d) (Fuller *CJSM* 2010).
- The elevated findings of contact injuries in men (Head/Neck) vs women (Upper and Lower Extremity).
- The injurious tackle techniques supporting appropriate instruction among this learning/developing playing population.
- The findings of a large percentage (32%) due to open play and running injuries.
- The increased muscle and tendon injuries due to running and open play may need further instruction on exercise-based injury prevention.

Knowledge on the risk factors and education interventions to aid in the global public health concern with the expansion of this collision/contact sport would aid developing rugby nations and National Olympic Committee.



2017 HIGHLIGHTS cont.



Rugby Research & Injury Prevention Group

Rugby Research and Injury Prevention Group have been working hard to complete the team's efforts this past year. Their group has attended 6 major sports medicine and science conferences around the globe over 2016-2018, promoting their efforts to understand the injury burden in U.S. Rugby-7s. This has been through the efforts of their collaborations with Auckland University of Technology, SPRINZ, Emerson Hospital in Connecticut, Missouri Orthopedic Institute, New York University and their generous sponsor the National Operating Committee on Standards for Athletic Equipment (www.nocsae.org).

Professional Conferences Attendance over 2016/17/18

- American College Sports Medicine (in Boston 2016, 2-topics, in Denver 2017, 5-topics, in Minneapolis 2018, 4-topics accepted & Sp Med Podium)
- IOC World Conference on Prevention and Injury & Illness in Sport - in Monaco (2017, 4-topics)
- Int'l Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine – Shanghai (2017 3-topics, Sp Med Podium)
- ASICS Sports Medicine Australia (2017 3-Podium topics)
- British Association of Sport and Exercise Sciences & The European Federation of Sports Psychology (2017, 2-topics)
- Eastern Athletic Training Association (2018 – 1 Podium topic)

Invited to attend:

- New Zealand Podiatry (2018 - Keynote)

Awards won:

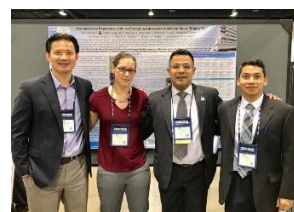
- 2017 ACSM- Best Clinical Case Podium Presentation & Featured Poster: Lopez, Ma, Wilinski, Evans & Allen
- 2017 ACSM- Leadership Diversity & Training Program - Lopez
- 2017 SMA (Australia)-Best New Investigator in Sports Injury Prevention - Lopez
- 2017 Fellowship, C Victoria -Columbia Univ., Mailman School of Public



Professor Hume and Dr V Lopez Jr. Recipient of the **2018 Sports Medicine Australia Award for Best New Investigator in Sports Injury Prevention**, for his work on "Injury rates in U.S. Rugby-7s and use of the RISE Report Methodology."



2016 IOC World Conference: With members of Rugby Science at Bath University UK -Dr Simon Roberts & Dr Michael Hislop, Bath University, Dr. Lopez and Dr. Richard Ma, MD (Co-Director, RRIPG).



2017 American College Sports Medicine: Dr. Richard Ma, MD, Dr Laurel S.D. Myers-Beauregard, DPT, RRIPG Regional Care Coordinator, Dr. Lopez, & Mr Christina Victoria, MPH, RRIPG Asst. Analyst.



2017 RRIPG/Hospital for Special Surgery, Summer Lecture Series: Dr Lopez and interns DM Pierre, F Gries, SC Queler, SY Haleem PTA, K JA Webb, MT Mettry, and Dr S Trifunovic, MD PT, Columbia Rehab.

2017 HIGHLIGHTS cont.

Topics Presented at Professional Conferences

- Victoria C, Lopez Jr., V, Ma R, Weinstein MG, Hume PA, Cantu RC, Queler SC, Allen AA. Evaluation of Injuries in levels of play in U.S. Rugby-7s: A 5-year Epidemiological Prospective Study of an Emerging Olympic Collision Sport in a Developing Market. *Med Sci Sports Exerc.* May 2017, 49(5S) 420. DOI: 10.1249/01.mss.0000518031.11844.a5.
- Lopez Jr., V, Ma R, Weinstein MG, Hume PA, Cantu RC, Victoria C, Marshall J, Locrotondo T, Nadkar N, Allen AA. An Epidemiological Injury Profile of Sub-elite U.S. Rugby-7s (USA Rugby National Club Championships). *Med Sci Sports Exerc.* May 2017, 49(5S) 421. DOI: 10.1249/01.mss.0000518034.57585.1a.
- Myers LSD, Lopez Jr., V, Ma R, Weinstein MG, Hume PA, Cantu RC, Victoria C, Marcano ED, Wilinski MS, Nadkar N, Allen AA. A 4-Year Epidemiological Analysis of Tournament Match Injuries in Men's Collegiate Rugby-7s. *Med Sci Sports Exerc.* 2017, 49(5S) 421–422. DOI: 10.1249/01.mss.0000518035.34715.c7.
- Ma R, Lopez Jr., V, Weinstein MG, Hume PA, Cantu RC, Victoria C, Queler SC, Webb KJA, Allen AA. The American Experience with an Emerging Adolescent Collision Sport: Rugby-7s. *Med Sci Sports Exerc.* 2017, 49(5S) 416. DOI: 10.1249/01.mss.0000518020.84948.37.
- Lopez Jr., V, Ma R, James DE, Wilinski MS, Allen AA. Sternoclavicular Injury – Rugby-15-players-a-side. *Med Sci Sports Exerc.* May 2017, 49(5S) 1006. DOI: 10.1249/01.mss.0000519760.37534.82. *Award - Best clinical case podium presentation & featured poster– Am. College of Sports Medicine.
- Lopez V, Jr., Ma R, Weinstein MG, Hume PA, Cantu RC, Myers LS, Victoria C, Nadkar NS, Allen AA. Concussive injuries in an amateur emerging U.S. collision sport: Rugby-7s. *J Arthro Rel Surg.* October 2017, 33(10) e102-e103. DOI: <http://dx.doi.org/10.1016/j.arthro.2017.08.108>.
- Lopez V, Jr., Hume PA, Ma, R, Weinstein MG, Cantu RC, Victoria C, Queler SC, Webb KJA, Allen AA. Colt under-19's rugby-7s injury rates in the USA. *J Sci Med Sport.* 2017;20(3): 65. DOI: <http://dx.doi.org/10.1016/j.jsams.2017.09.322>.
- Ma, R, Lopez V, Jr., Weinstein MG, Hume PA, Cantu RC, Victoria C, Pandit KV, Mettry MT, Allen AA. Rugby-7s concussion incidence in the USA. *J Sci Med Sport.* Nov 2017;20(3):63. DOI: <http://dx.doi.org/10.1016/j.jsams.2017.09.320>.
- Lopez V, Jr., Ma, R, Weinstein MG, Hume PA, Cantu RC, Victoria C, Queler SC, Pierre DM, Allen AA. Injury rates of U.S. rugby-7s an olympic collision sport: using the RISE report methodology. *J Sci Med Sport.* Nov 2017;20(3):64. DOI: <http://dx.doi.org/10.1016/j.jsams.2017.09.321>. *Award - Best new investigator in sports injury prevention – Sports Medicine Australia.

2017 RRIPG Event Attendance



2017 Northeast Academy Lupus Intus, Elite Womens USA Rugby Olympic Development Invitational, Hanover, NH. Reflecting the top womens rugby-7s play in North America.



2017 USA Rugby National Club 7-a-side Championships Blaine, Minnesota, a Sub-elite event representative of all U.S. Competitive Regions, Team: Dr. Lopez, Dr Tony Locrotondo, and ATs' Carmen Chona, A. Connacher, Lindsay, Erik Braun, Dani Schroeder & D. Rodgers.



2017 United World Sports Las Vegas Invitational, Nevada, the largest rugby event in North America with >3,000 athletes: Team: Dr Lopez, C Victoria, B Fetter, SC Queler, Josh Frees, Kori Jefferies, Daniel Rodgers, Justin Miller, Demetrious Amore, Anthony Connacher & Dr. Ma



2017 United World Sports, Collegiate Rugby Championships, Philadelphia, PA, on NBC. Team Dr Ma, B Lindsey, C Chona, C Victoria, N April, A Prewitt, E Marcano & J Bistline.

2017 HIGHLIGHTS cont.



The Northeast Rugby Olympic Development Academy

This past year Dr. Lopez, Director of Medical Services for the Northeast Rugby Olympic Development Academy (2016-2017), and their skilled staff, are fortunate to convey that we have graduated more than 10 athletes to the National Team. To play on the World Rugby HSBC Sevens Series, the Americas Rugby Cup Championship and the planned World Rugby - Rugby World Cup in Sevens, July 20, 22, 2018, San Francisco, CA, USA.



Northeast Women's Squad at Rugby Barbados World 7s with Dr. Lopez, and N Lichtenwalner ATC.
Graduates of NRODA 2016-2017



Graduates of NRODA 2016-2017.



Fox News International, September 11, 2017, NY, NY.

Football Turns to Rugby for Tackling Safety Measures:

Sep. 11, 2017 - 2:20 - With the NFL still grappling with the long-term impact of concussions, some American football programs are turning to lessons from rugby to help prevent injuries. Could rugby-style tackling be the key to making the sport safer? What Safety Lessons can Football Learn from Rugby? Dr Victor Lopez Jr, Executive Director of the Rugby Research and Injury Prevention Group, and Mr Kent Oszmanski, Performance Rep, Rhino Rugby USA, discuss with Fox Producers, Mr Sean Conlon & Mr Gabe Nazario, their opinions on the potential impact of the rugby tackle to have injury preventive measures, due to rugby's lack of use of external safety gear.

Thanks to the multiple tournament directors and team officers for their tireless efforts of promoting rugby in the U.S. and executing the events for the development of players, teams and enjoyment of all.

The RRIPG THANK, Dr. Answorth A. Allen, concussion expert Dr. Robert C Cantu, and Professor Patria Hume, & Sponsors Hospital for Special Surgery a US Olympic Committee Medical Treatment Center and the National Operating Committee on Standards for Athletic Equipment, including United World Sports and USA Rugby for attendance at their events.



2017 HIGHLIGHTS cont.

Associate Professor Nicholas Gill

Strength & Condition Coach All Blacks, New Zealand Rugby Union

Successful "innovation" grant from HPSNZ to investigate heat acclimation in team sports for Tokyo 2020 – Rugby Sevens



Publications

- Frank A. Bourgeois, Paul Gamble, Nic D. Gill, Mike R. McGuigan: Effects of a six-week strength training programme on change of direction performance in youth team sport athletes. 10/2017; 5(4):83., DOI:10.3390/sports5040083
- Daniel Travis McMaster, Christopher Martyn Beaven, Brad Mayo, Nicholas Gill, Kim Hebert-Losier: The efficacy of wrestling-style compression suits to improve muscle force and movement velocity in well-trained male rugby athletes. Frontiers in Physiology 10/2017; DOI:10.3389/fphys.2017.00874
- Angus Lindsay, John G. Lewis, Nicholas Gill, Nick Draper, Steven P. Gieseg: No relationship exists between urinary NT-proBNP and GPS technology in professional rugby union. Journal of Science and Medicine in Sport. 01/2017; DOI:10.1016/j.j.2016.11.017
- Matthew R. Blair, John B. Cronin, Nancy J. Rehrer, Chris Button, Nicholas D. Gill. Contextual review of physical requirements of refereeing rugby union at an elite level. Strength & Conditioning Journal. 11/2017. doi: 10.1519/SSC.0000000000000352
- Lee A. Bridgeman, Michael R. McGuigan, Nicholas D. Gill, Deborah K. Dulson. The effects of accentuated eccentric loading on the drop jump exercise and the subsequent postactivation potentiation response. The Journal of Strength & Conditioning Research, 31,6,1620-1626,2017.
- Lee A. Bridgeman, Nicholas D. Gill, Deborah K. Dulson, Michael R. McGuigan. The effect of exercise-induced muscle damage after a bout of accentuated eccentric load drop jumps and the repeated bout effect. The Journal of Strength & Conditioning Research,31,2,386-394,2017.

Kim Simperingham

Auckland University of Technology & High Performance Sport New Zealand

Involvement in the All Blacks vs Lions rugby series and Team New Zealand's build up to the America's Cup

Publications

- Simperingham, K. D., Cronin, J. B., Pearson, S. N. & Ross, A. (2017). Reliability of horizontal force-velocity-power profiling during short sprint-running accelerations using radar technology. SPORTS BIOMECHANICS, doi: 10.1080/14763141.2017.1386707. [Epub ahead of print]

2017 HIGHLIGHTS cont.

Casey Watkins

Auckland University of Technology



Current Research Projects

- PhD - Strength and Conditioning, periodization, and dose response in elite rugby athletes
- PGR2 & Ethics approved for PhD thesis: Most efficient ways of improving speed and acceleration in Elite rugby athletes.
- Proposal submitted to NZR

“Graduating California State University Fullerton with a MSc in Kinesiology, getting accepted, moving internationally and starting my PhD program at AUT, and getting my Masters’ thesis published in JSCR: Vertical jump as a measure of neuromuscular fatigue and readiness.”

Peer-reviewed Journal Articles

- Dobbs IJ, Watkins CM, Barillas SR, Wong MA, Brown LE. Assessing knee strength ratios and bilateral deficit via dynamic vs. static tests in amateur rugby union players. *Isokinetics and Exercise Science*. 25(4):281-287, 2017.
- Dobbs IJ, Wong MA, Watkins CM, Barillas SR, Rivera M, Coburn JW, Costa PB, Brown LE. Correlation between isometric horizontal push force and sprint times across positions in collegiate rugby union players. *Journal of Australian Strength and Conditioning*. (in press).
- Watkins CM, Barillas SR, Wong MA, Archer DC, Dobbs IJ, Lockie RG, Coburn JW, Tran TT, Brown LE. Determination of vertical jump as a measure of neuromuscular readiness and fatigue. *Journal of Strength and Conditioning Research*. 31(12):3305-3310, 2017.

Conferences Abstracts

- Watkins CM, Barillas SR, Wong MA, Dobbs IJ, Lin A, Munger CN, Archer DC, Brown LE. *Leg Strength Differences Between Women’s Collegiate Spirit Squad and Rugby Players*. NSCA Annual Meeting, Las Vegas, NV, July 12-15, 2017. *Journal of Strength and Conditioning Research*, 31(12), 2017.
- Dobbs IJ, Wong MA, Watkins CM, Barillas SR, Rivera M, Coburn JW, Costa PB, Brown LE. *Relationship between isometric horizontal push force and sprint speed in collegiate rugby players*. NSCA Annual Meeting, Las Vegas, NV, July 12-15, 2017. *Journal of Strength and Conditioning Research*, 31(12), 2017.
- Kammerer JD, Dobbs IJ, Wong MA, Watkins CM, Barillas SR, Rivera M, Coburn JW, Costa PB, Brown LE. *Differences between unilateral and bilateral horizontal isometric push force in collegiate rugby players*. NSCA Annual Meeting, Las Vegas, NV, July 12-15, 2017.
- Dobbs IJ, Watkins CM, Wong MA, Barillas SR, Brown LE. Hamstrings to quadriceps ratios differ between legs and isometric and dynamic tests in amateur rugby players. ACSM Annual Meeting, Denver, CO, May 30-June 3, 2017.
- Watkins CM, Wong MA, Barillas SR, Dobbs IJ, Brown LE. Differences Between Open and Closed-Kinetic Chain Measurements for Assessing Bilateral Strength Deficits. ACSM Annual Meeting, Denver, CO, My 30-June 3, 2017.

MEMBER SPOT LIGHT

Dylan Clever

Sports editor-at-large, NZ Herald

Dylan has a journalism scholarship to understand concussion and experts in the field. As a member of the Rugby Codes Research Group, Dylan provides print media coverage of rugby related issues in the New Zealand Herald. Dylan will be covering the March visit of

- Professor Patrick Neary to AUT where he will be conducting data collection for the Global RugbyHealth Research Programme: Integration of multimodal imaging techniques for assessment and diagnosis of concussion or mild traumatic brain injury (mTBI).

SPRINZ, the University of Regina, and Leeds Beckett University, as part of the Global RugbyHealth Research Programme, are conducting a study on bodily functions such as heart rate, breathing, blood pressure following retirement from sport for previous rugby players who sustained one or more concussions during their playing days.

Dylan is writing about the study in progress as part of the global programme to understand the effects of concussion, is promoting the NZ data collection to encourage people to participate, and to profile the visit of Patrick who is an expert in the area.



Professor Patrick Neary

University of Regina



Patrick is a Professor at the University of Regina who holds a PhD in exercise physiology. His research interests and experience include integrative exercise physiology of cerebral and muscular fatigue, cardiovascular function, and ballistocardiography pathophysiology of concussion. He has developed a research program to examine the pathophysiology of mild traumatic brain injury or sport-related concussion which was funded nationally by the Canadian Institutes of Health Research (CIHR), and provincially by the Saskatchewan Health Research Foundation (SHRF) and Heart & Stroke Foundation (H&SF). His research has confirmed that transient cerebrovascular (blood flow regulation, cerebral oxygenation) and cardiovascular (heart rate variability, blood pressure) disturbances occur following a concussion. He has held funding from the Natural Sciences and Engineering Research Council of Canada (NSERC) for his research to investigate the physiological mechanism(s) associated with cerebral, skeletal and cardiac muscle fatigue during exercise. His applied research in this area has been used to understand the effects of physical stress in occupational fields such as firefighting and shift work. He has been funded by the Canadian Government Department of National Defense to examine factors related to neck strain and muscle fatigue in helicopter pilots using night vision goggles. He is a member of the Canadian Society for Exercise Physiology (CSEP), and the European College of Sport Science (ECSS).

Prof. Neary is an active collaborator on the Global Rugby Health Research Programme. His current RCRG project aims to understand the physiological responses during rest, during changes in respiration (breathing) rate, and during exercise, following retirement from sport for previous players of rugby and football who sustained one or more concussions during their playing days. It is hoped that this research will provide an indication of the long-term effects of multiple concussions on brain and heart function (physiology).

- Hume, P. A., Neary, P., Wood, M., & McGeown, J. (2018). Global RugbyHealth Research Programme: Integration of multimodal imaging techniques for assessment and diagnosis of concussion or mild traumatic brain injury (mTBI).

WHAT'S HAPPENING 2018

Dr Adrian Cohen

University of New South Wales

Research Plans

We are looking to do research on our Concussionometer device. We would ideally like to have a centre in New Zealand to parallel our work here and in the United States. This research would be conducted under our existing Ethics Approval (NEAF HREC number 17/039 Diagnosis of Mild Traumatic Brain Injury with Visual-Evoked Potentials) and we would ultimately seek to publish the results, acknowledging your contribution and authorship if you would like to be involved in that aspect.

Proposed Research Protocol

Baseline (less than 10 minutes per playeras many as possible) at first/early team training

- Enrolment and consent (online form <https://form.jotformpro.com/71480287307963>)
- King Devick Test baseline
- Concussionometer baseline

Weekly at training (less than 5 minutes per player....as many as possible)

- King Devick Test update
- Concussionometer update

Post Injury/Concussion (less than 5 minutes per player)

- Online Headsafe Injury Assessment (HIA/SCAT5) form <https://form.jotformpro.com/61752453819967>
- King Devick Test update
- Concussionometer update

Potential outcomes

This way we may be able to identify players who have sustained concussion and cumulative sub-concussive impacts which lead to decreased electrophysiological performance.

New Developments - Concussion passport

To this we can add a consistent Physical Exam which can be filled out by their own doctor:

<http://app.concussionpassport.com/> which standardises the examination and provides a searchable database of physical signs (as opposed to doctor's hand-written notes or other medical practice software.



Japanese rugby research delegation visit to AUT SPRINZ

On 2nd March 2018 a group of Japanese rugby research collaborators visited AUT SPRINZ, including Dr Sayumi Iwamoto (2nd from right front) and Dr Takayuki Kawasaki (third from left back). Dr Kawasaki MD PhD focuses on shoulder injury in rugby and works at the Department of Orthopaedic Surgery. The team met in Japan in 2016 during the Keio Rugby and Blues Rugby anthropometry and performance project.



Navigating Two World: Pacific Island experience and contribution to non-playing participation in rugby

SPRINZ, NZ Rugby, Auckland Rugby

Background

Navigating Two Worlds began in 2016 by gathering insights from Pacific people within the New Zealand Rugby community about their perspectives on Pacific contribution to non-playing roles in rugby. It has since grown into an action research project that is seeking to create change within rugby in New Zealand.

In 2017, the research team were asked to present a series of workshops to the New Zealand Rugby community including the Provincial Union CEOs and Chairpersons Forum in Wellington (July, 2017), the Auckland Rugby Union's club chairman meeting (May, 2017) and the Wider Auckland Governance Group meeting (mixture of NZR board and staff) (February, 2017). Collaboration with Steve Lancaster, Mike Hester (New Zealand Rugby), Simon Devoy (Auckland Rugby). New Zealand Rugby 2017 funding: \$38,000 (incl support for club capability and secondary school participation projects).



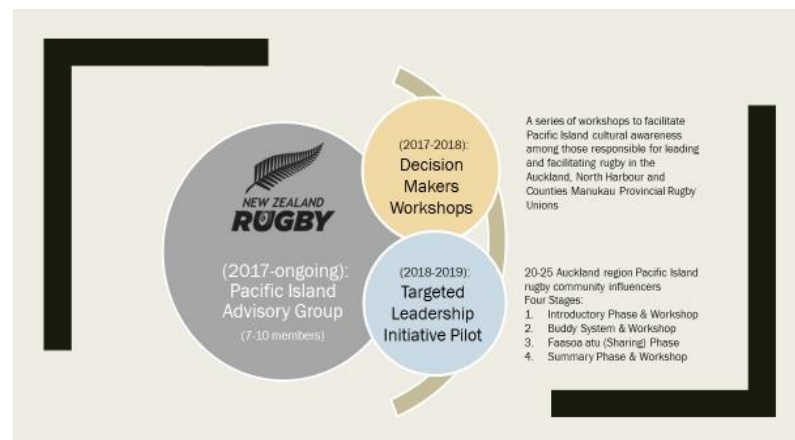
Early instigators of Navigating Two Worlds from left: Keven Mealamu, Chantelle Huch, Simon Devoy, Katie Dee, Lesley Ferkins

The Research

An action research project in collaboration with New Zealand Rugby designed to generate greater Pacific Island contribution to non-playing leadership within the New Zealand Rugby system as well as develop greater cultural intelligence within rugby in New Zealand.

The Project Team

AUT: Lesley Ferkins, Gaye Bryham, Stephen Gee, Nicole Manuela
NZR: Steve Lancaster, Mike Hester, Karen Skinner
ARU: Simon Devoy



The Project

The three action elements of the N2W project (2017-2020) are:

- 1. Advisory group:** To oversee the project to completion. Core Advisory group: A subgroup of the advisory group, provide advice and guidance to the project team when required.
- 2. Cultural Competency programme:** Aims to develop understanding of Pacific Island culture within the New Zealand Rugby community. The cultural intelligence programme for predominately Euro-centric rugby leaders.
- 3. Targeted leadership/ Mentoring programme:** An emerging Pacific Island leadership group of approx. 20-25 emerging leaders, who will be supported through a programme and a mentoring group of other Pacific leaders.

Project Partners



AUT SPORTS PERFORMANCE
RESEARCH INSTITUTE NEW ZEALAND

AUT

RESEARCH &
INNOVATION



Dr Caryn Zinn

Auckland University of Technology

Proposed Research

Pilot: Case study work to assess the effect of nutritional ketosis (achieved using a combination of the ketogenic diet, ketone dietary supplements and fasting) on concussion management.

RCT: To investigate the effect of a ketogenic diet compared with usual dietary care on concussion management.



Paul Macadam

Auckland University of Technology

Research Projects

Sprint-running acceleration performance with forearm wearable resistance
Project aim: The purpose of this study was to determine the acute changes in kinematics and kinetics when wearable resistance of 1 kg (equivalent to ~1% body mass) was attached to each forearm during over ground short distance (20 m) maximal sprint-running. Twenty-two male amateur rugby athletes (19.4 ± 0.5 years; 97.0 ± 4.8 kg; 180.4 ± 7.2 cm) volunteered to participate in the study.
Project Status: Article submitted to Journal of Science and Medicine in Sport October 2017

Longitudinal effects of lower-limb wearable resistance on sprint performance
Project Aim: The purpose of this study was to determine the longitudinal changes in kinematics and kinetics when wearable resistance of equivalent to ~3-5% body mass was attached to legs during over ground short distance maximal sprint-running. A group of 30 male amateur rugby athletes volunteered to participate in the study.
Project Status - Data analysis ongoing.

Dr Kazuko Ishikawa-Takata

National Institute of Health and Nutrition, NIBION Department of Nutritional epidemiology and Shokuiku

Dr Masaharu Kagawa

National Institute of Nutrition Sciences, Kagawa Nutrition University

Dr Sayumi Iwamoto

Faculty of Human Life Design, Toyo University

“In March of 2017 we went to the physical measurement of the Keio University Rugby Club and carried out the last measurement of the season. In addition, in April, at the training camp of the All Japan Rugby team, we supported physical measurement and made useful feedback for team conditioning.”



Research Publications

- Iwamoto, S., Takata, I. K., Ohta, C., Hume, P. A., & Kagawa, M. (2017, 22-23 July). *Physical measurement data of Japanese university rugby players and examples of how to use it in rugby field*. Paper presented at the 6th Japanese Society for Athletic Training.
- Iwamoto, S., Takata, I. K., Ohta, C., Hume, P. A., Shaw, D., Kara, S., & Kagawa, M. (2017). Anthropometric data and somatotype of Japanese university rugby players: Position characteristics of forwards and backs players. *Journal of Training Science for Exercise and Sport*, 29(2), 144-152.

