

Capability Statement

**Aligned to Australia's National Science and
Research Priorities for High Performance Sport**



Foreword

CQUniversity is proud to be a national leader in movement-related education, research, and innovation.

With a strong regional foundation and a vast national footprint, we are deeply committed to improving lives through sport, exercise, physical activity, and occupational and rehabilitation therapy.

CQUniversity's *SPORT Strategy 2025–2028* reflects this commitment, showcasing our strengths across teaching, research, partnerships, and community engagement.

It also reinforces our belief that **movement changes lives.**

The revitalised *Australia's National Science and Research Priorities for High Performance Sport* provides a timely and strategic framework to align our efforts. These priorities closely affiliate with CQUniversity's capabilities and aspirations, and we are determined to play a meaningful role in advancing them.

Through collaborative research, applied science, and innovation, we are committed to helping Australia's athletes *Win Well* and supporting the high-performance sport system in achieving the goals of the *HP2032+ Sport Strategy*.

Please find an outline of CQUniversity's capabilities in addressing and assisting in the key priorities for High Performance Sport.

How we align

CQUniversity brings a diverse and impactful set of capabilities that directly support the strategic goals of Australia's high performance sport system.

Our expertise spans athlete wellbeing, performance science, data analytics, equipment innovation, and evidence-based practice.



Source: Australia's National Science and Research Priorities for High Performance Sport

We believe we have the capacity and the experts to fulfill the key Priorities as set out in *Australia's National Science and Research Priorities for High Performance* as follows:

- **Supporting Athletes:** We deliver evidence-based research that enhance athlete wellbeing, recovery, and resilience across diverse sporting contexts.
- **Performance Optimisation:** Our applied sport science capabilities drive improvements in training efficiency and competitive outcomes.
- **Strategic Insight:** We apply longitudinal tracking, predictive modelling, and performance analysis to inform decision-making and long-term athlete development.
- **Competitive Equipment:** Our expertise in wearable technologies, equipment testing, and material innovation supports the development of performance-enhancing tools.
- **Better Practice:** We translate research into practice through coaching education, policy development, and integrated support for sport practitioners.



SUPPORTING ATHLETES

	Advancements in athlete identification and development, including the ways in which the physical growth and maturation and psycho-social development of young people impacts involvement and progression in HP pathways.	Athlete physical, mental, emotional and social wellbeing to support sustained, successful sport performances.	The needs of a diverse athlete population, with a particular focus on areas with identified knowledge gaps.
A/Prof. Melanie Hayman		Exercise in elite athletes during preconception; pregnancy and postpartum; performance management; return to play	
Prof. Charli Sargent		Impact of sleep on mood, anxiety, well-being, and mental or cognitive fatigue	
Prof. Greg Roach			
Dr. Alberto Filgueiras	Mental health; talent identification; psychological assessment; sport initiation and specialisation; emotional regulation; mental training; cross-cultural dimensions of sports		
Dr. Cassy Dittman	Parenting in sport; child and adolescent athlete mental health		
A/Prof. Katie de Luca		Physical health including pain and injury; rehabilitation; allied health care; social wellbeing	
Dr. Nathan Elsworth	Sports officials; perceptual decision making; wellbeing; talent identification		
Prof. Fabio Serpiello	Assessment of growth and maturation for talent development		
Dr. Alicia Carter	Mental health and wellbeing; shame and criticism; connection		
Dr. Amy Johnson		Crisis communication; strategic communication; wellbeing; identity in high performers	

PERFORMANCE OPTIMISATION

	Optimising training, based on athlete needs and on the specific requirements and complexity of sport competitions.	Monitoring and management of training load and fatigue to improve competition performance.	Performing in challenging environmental conditions.	Interdisciplinary approaches to providing tailored solutions to sport-specific challenges.	Deep dives into discipline-specific solutions, supporting specific areas of performance.
Prof. Fabio Serpiello	Load and wellness monitoring: fitness testing; game statistics, performance metrics	Return to play, strength and conditioning, athlete monitoring	Training load monitoring	Football and futsal performance analysis and training	
A/Prof Aaron Scanlan				Basketball and team sport research	
Dr Nathan Elsworth				Referees	
A/Prof. Joshua Guy	Return to play, strength and conditioning, athlete monitoring	Training load monitoring	Sleep quality/quantity; physical/mental fatigue; sleep loss/restriction; circadian disruption and misalignment; transmeridian travel; wearable devices; altitude exposure; temperature exposure	High-performance basketball research	
Dr. Rogan Bartlett				Return to play	
Prof. Andy Stewart	Training load monitoring			Periodisation and tapering	
Prof. Charli Sargent	Sleep quality/quantity; physical/mental fatigue; sleep loss/restriction; circadian disruption and misalignment; transmeridian travel; wearable devices; altitude exposure; temperature exposure				
Prof. Greg Roach					
Dr. Michele Lastella					
Dr. Dean Miller	Exercise in elite athletes during preconception; pregnancy and postpartum; performance management; return to play				
A/Prof. Melanie Hayman					
Dr. Alberto Filgueiras	Cognition and decision making in football; mental health; mental training; artificial intelligence in talent identification; team environment and motivational climate				
Dr. Danya Hodgetts	>>>>		High-performance team management; talent identification; field testing reliability and validation; swim testing and underwater camera analysis		
Dr. Geoff Warman	>>>>		Visual exploration (scanning); skill development; analysis of technique; wearable sensors; inertial measurement units (IMU); global positioning system units (GPS); development of representative training environments; coach development		
A/Prof. Katie de Luca				Management of sporting injuries; sports medicine; rehabilitation; interdisciplinary and integrated care; allied health; optimising function	
Dr. Alicia Carter				Shame; criticism, mental health and wellbeing	
Dr. Amy Johnson				Crisis communication; strategic communication; wellbeing; identity in high performers	
Mr. James Czencz				Program development supporting foundational strength, endurance and participation focus.	
A/Prof. Santoso Wibowo			Socio-behavioural and cultural factors of performance.		
Dr. Saman Khalesi	Personalise nutrition guides to meet training demands, optimise recovery, and maximise training adaptations; Tailored nutrition literacy content and resources to address specific nutritional challenges, and promote physical and mental health.				

STRATEGIC INSIGHTS

	Determinants of successful competition performance, performance predictors, performance modelling.	Real time and strategic analysis of training and competition, including data-informed technical and tactical decision-making during competitions; data-informed design of future training and practice; performance analysis and strategic insight.	Ethical and lawful opponent analysis, including during competition and long-term performance trends.	Competition environment intelligence, including understanding and predicting competition environment and potential conditions on race day (e.g., climate, venue layout, course profile, travel to and from, altitude, wind, water conditions, crowd).
A/Prof. Aaron Scanlan	Basketball; team sport; game statistics and in-game performance metrics; load monitoring			
Prof. Fabio Serpiello	Movement tracking (GPS, LPS, optical); technology validation; video analysis			
Dr. Nathan Elsworth	Team sport; contextual factors; sports performance; monitoring and management of load; officiating			
Dr. Dean Miller	Jet lag adaptation; sleep tracking; physiological metrics (e.g., HRV); environmental changes post-travel (e.g., change of season)			Jet lag adaptation; sleep tracking; physiological metrics (e.g., HRV); environmental changes post-travel (e.g., change of season)
Prof. Charli Sargent				
Prof. Greg Roach				
Mr. James Czencz	Integration of data collection, community feedback and obtaining contextual knowledge to inform program design			
Dr. Rogan Bartlett	Return to play; strength and conditioning; athlete monitoring			
Dr. Danya Hodgetts	Event legacy relationship - between elite performance and sport participation			
Dr. Alicia Carter	Energising focus; emotional regulation; drive system activation			
Dr. Alberto Filgueiras	Emotional regulation; mental health and performance; real-time decision making; anticipation and tactical knowledge			<<<<
Dr. Geoff Warman	Visual exploration (scanning); skill development; analysis of technique; wearable sensors; inertial measurement units (IMU); global positioning system units (GPS); development of representative training environments; coach development			
Dr. Ahmed Kinebar	Predictive modelling; project success; decision making; dynamic analysis; strategic performance analysis; dynamic performance monitoring			
Dr. Kaveh Mirzaei				
Dr. Rokšana Tumpa	Resource allocation in training; implementation frameworks			
Dr. Fatima Afzal	Competition strategy; decision making; performance evaluation			
Dr. Ziyad Abunada				
A/Prof. Santoso Wibowo	Computer vision analysis to assist coaches with decision-making using AI-powered detection			
Dr. Zhenglin Wang				
Dr. Anwaar Ulhaq	Real-time data processing; event-driven data processing; advanced statistical models for decision making			
Dr. Osama Dawoud				

COMPETITIVE EQUIPMENT

	Equipment design and optimisation, balancing innovation robustness, manufacturing and regulatory requirements. Considerations include aerodynamics, materials, travel requirements, etc.	Sport-specific components, such as pedals, footpegs, handles, wheels, rackets, bats, etc.	Custom-built equipment, tailored to the individual athlete. Considerations include effective and rapid manufacturing.	Competitive garments, for training and competitions. Considerations include, but are not limited to, aerodynamics, sustainable materials, cooling properties.	Technology integration, incorporating advanced technologies, such as sensors and smart materials, into sports equipment, for accurate and valid measurement of relevant variables.
Prof. Fabio Serpiello					Wearable technology validation
Dr. Dean Miller	Automated tools for jet lag				
Prof. Charli Sargent					
Prof. Greg Roach					
Dr. Nathan Elsworth	Virtual reality				
Dr. Alberto Filgueiras	Virtual reality for mental training			Low-cost transcranial direct current stimulation in motor learning; EEG-based neurofeedback training	
Dr. Geoff Warman					Visual exploration (scanning); skill development; analysis of technique; wearable sensors; inertial measurement units (IMU); global positioning system units (GPS); development of representative training environments; coach development
Mr. James Czencz			Involvement and use of selection and use of adaptive equipment		
Dr. Ahmed Kineber	Equipment design and optimisation, resource allocation, manufacturing efficiency, design optimisation techniques				Performance enhancement through technology, digital tools in performance monitoring, advanced robotics integration
Dr. Kaveh Mirzaei					IoT (Internet of Things) integration, smart systems, automation in technology, digital transformation, system integration technologies
Dr. Xianbo Zhao					Smart materials technologies
Dr. Philip Langat	Product development, systems engineering, sustainable product design, lean manufacturing principles				Remote sensing, technology integration

BETTER PRACTICE

	Coach development and coaching science, including a focus on the coaching profession, women in HP coaching, and enhancing learning design.	Dissemination, translation and implementation of trustworthy research results into practice.	Appropriate program evaluation practices, including impact assessment.
Prof. Fabio Serpiello		Research translation into education programs; research performance evaluation	
Dr. Dean Miller		Field-based protocols for sleep and circadian factors; translation of established sleep science to HP environment	
Mr. James Czencz		Community-based physical activity models, including co-design with people with disabilities	
A/Prof. Joshua Guy	Heat acclimation and physiology, applied sports science and high performance in basketball and rugby league; strength and conditioning and training load management in team sports; athlete management systems		
Dr. Danya Hodgetts	Coach and official development and education; program evaluation of coach and official programs for ASC; whole of sport development and pathway planning		
A/Prof. Aaron Scanlan		Manuscript development and writing; visual design; validation and reliability analyses; research design; basketball; team sport	
Dr. Alicia Carter	Relationship connection and management; program development, implementation and evaluation; qualitative and quantitative assessment of practice and impact		
Prof. Charli Sargent		Best practice guidelines for monitoring/assessing sleep, fatigue, circadian misalignment; database development to inform decision making and priorities	
Prof. Greg Roach			
Dr. Alberto Filgueiras	Leadership training; coaching staff mental health; psychological assessment; data-driven decision-making; motivational climate; sports organisations environment		
A/Prof. Melanie Hayman		Best practice guidelines for elite female athletes during preconception, pregnancy and parenthood; sports organisations environments; research translation into education programs; gender equality; female athletes; women in sport	
Dr. Cassy Dittman		Program development; research translation into parent education programs; evaluation methodology including randomised controlled trials, feasibility and pilot trials; measure development and validation	
Dr. Geoff Warman	Visual exploration (scanning); skill development; analysis of technique; wearable sensors; inertial measurement units (IMU); global positioning system units (GPS); development of representative training environments; coach development		
A/Prof. Katie de Luca		Sports injury management, best practice guidelines for musculoskeletal pain	
Dr. Elise Rivera		Co-creation and co-design with communities to develop physical activity interventions and best practice strategies for PA promotion across the lifespan and among priority populations (e.g., LGBTQIA+, CALD, persons living with disabilities)	
Dr. Sasha Job		Inclusive physical activities, particularly community and nature-based; innovative physical activity solutions for people with disability and older people; co-design; best practice recommendations	
Dr. Nathan Elsworthy	Virtual reality; perceptual decision-making training		
Dr. Michele Lastella	Technical and tactical elements of coaching		
Dr. Roksana Tumpa	Emotional intelligence in coaching, enhancing learning design, performance enhancement coaching		
Dr. Fatima Afzal	High-performance coaching		
Dr. Xianbo Zhao	Organisational management, leadership development		
Dr. Saman Khalesi		Best practice guidelines for physical activity and exercise nutrition; evidence-based diet for sports performance	

Our locations



CQU Capabilities in Focus

Groundbreaking research guides Australian sport to support parent athletes



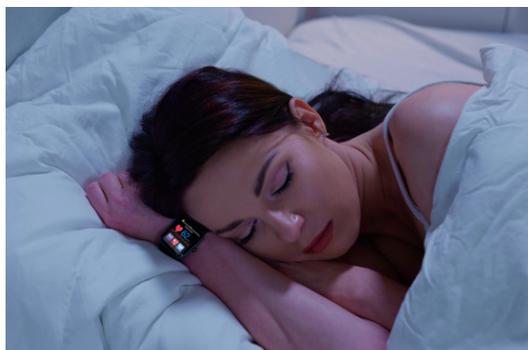
Australia's elite athletes can be supported right through the parenthood journey, thanks to new national best-practice recommendations designed for sporting organisations.

Backed by some of Australia's top sportswomen, sports administrators, and health and performance professionals, the comprehensive recommendations are applicable across all sports and codes.

CQUniversity researchers developed the *AIS Best-Practice Recommendations to Support Elite Athletes from Preconception to Parenthood* guide with the Australian Institute of Sport (AIS), Queensland Academy of Sport (QAS) and athletes themselves, to give clubs and organisations a best-practice approach to support athletes from preconception through to parenthood.

[Find out more](#)

How do sleep trackers work, and are they worth it?



CQUniversity's sleep research, led by researchers at the Appleton Institute for Behavioural Sciences, explores the evolving accuracy of wearable sleep trackers.

While traditional polysomnography remains the gold standard, modern wearables use accelerometry and photoplethysmography (PPG) to estimate sleep stages and duration. Validation studies show wearables can detect sleep with over 90% accuracy, though staging remains less precise.

CQUniversity contributes to advancing these technologies, supporting better sleep health through accessible, data-driven tools. Our research empowers individuals to track long-term sleep trends and adopt healthier sleep habits, bridging clinical science with everyday wellness.

[Find out more](#)

CQU research pressing trends in high performance sport with the Leaders Performance Institute



The future of elite sport is getting global attention, as CQUniversity academics collaborate with the Leaders Performance Institute, Exercise and Sports Science Australia (ESSA), the British Association of Sport and Exercise Science (BASES), and Management Futures, to explore the state of the sector.

The Future Trends in High Performance Sport report, led by UK-based Leaders Performance Institute, is the first of its kind, cross-sport industry report, set to unearth the biggest topics, challenges and focuses of high-performance sport.

CQUniversity Director of Sport Strategy Professor Fabio Serpiello said the groundbreaking work will help sporting organisations future-proof their high-performance development and take action to stay ahead of the performance curve.

[Find out more](#)

Rugby parenting intervention boosts sidelines behaviour, family connection - CQUniversity



Parents of junior rugby league players have found a unique program promoting positive behaviours on sidelines of their kids' sport is also making a difference to their parenting at home.

The Play Well Triple P program, developed by CQUniversity and University of Queensland with the National Rugby League and Queensland Rugby League, helps ensure children better enjoy and value their participation in the sport.

Offered to junior rugby league parents across the 2021 and 2022 seasons, it's now set to go national, as the NRL rolls out its interactive online and text message education and support to competitions across Australia.

[Find out more](#)

From backyard goals to World Cup dreams



As Australia celebrates qualification for the 2026 FIFA World Cup, young Aussies across the country are kicking around big dreams – and it's not just the boys. After the Matildas' historic run at the 2023 Women's World Cup and the Socceroos' continued international success, both teams are inspiring a new generation of players.

CQUniversity sports psychology expert Dr Alberto Filgueiras says watching elite players compete on the world stage can have a powerful developmental impact on children – shaping their sense of identity, self-belief and long-term goals. Dr Filgueiras has worked with elite athletes across 13 nationalities, including during his time with Brazil's National Olympic Committee and Flamengo – one of the country's top football clubs.

[Find out more](#)

CQUniversity announces historic Taipans partnership - CQUniversity



CQUniversity has strengthened its decade-long partnership with the Cairns Taipans, becoming the team's inaugural High-Performance Partner.

This collaboration integrates CQUniversity's expertise in Sports Science, Allied Health, and Psychology with elite-level basketball, offering students hands-on experience in player monitoring and performance enhancement.

Through embedded research and holistic strength and conditioning programs, Taipans athletes benefit from cutting-edge insights, while students gain real-world exposure to high-performance environments.

The partnership reflects CQUniversity's commitment to excellence in sport, research, and community engagement in Far North Queensland.

[Find out more](#)

[Read more stories here](#)



Contact us.

CQUniversity invites you to learn more about our Sport Strategy, our Strategic Partnerships and our Regional Commitment.

Visit our [Sport Strategy website](#) or email us at sport.strategy@cqu.edu.au

For more information, please contact Professor Fabio Serpiello, Director, Sport Strategy
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