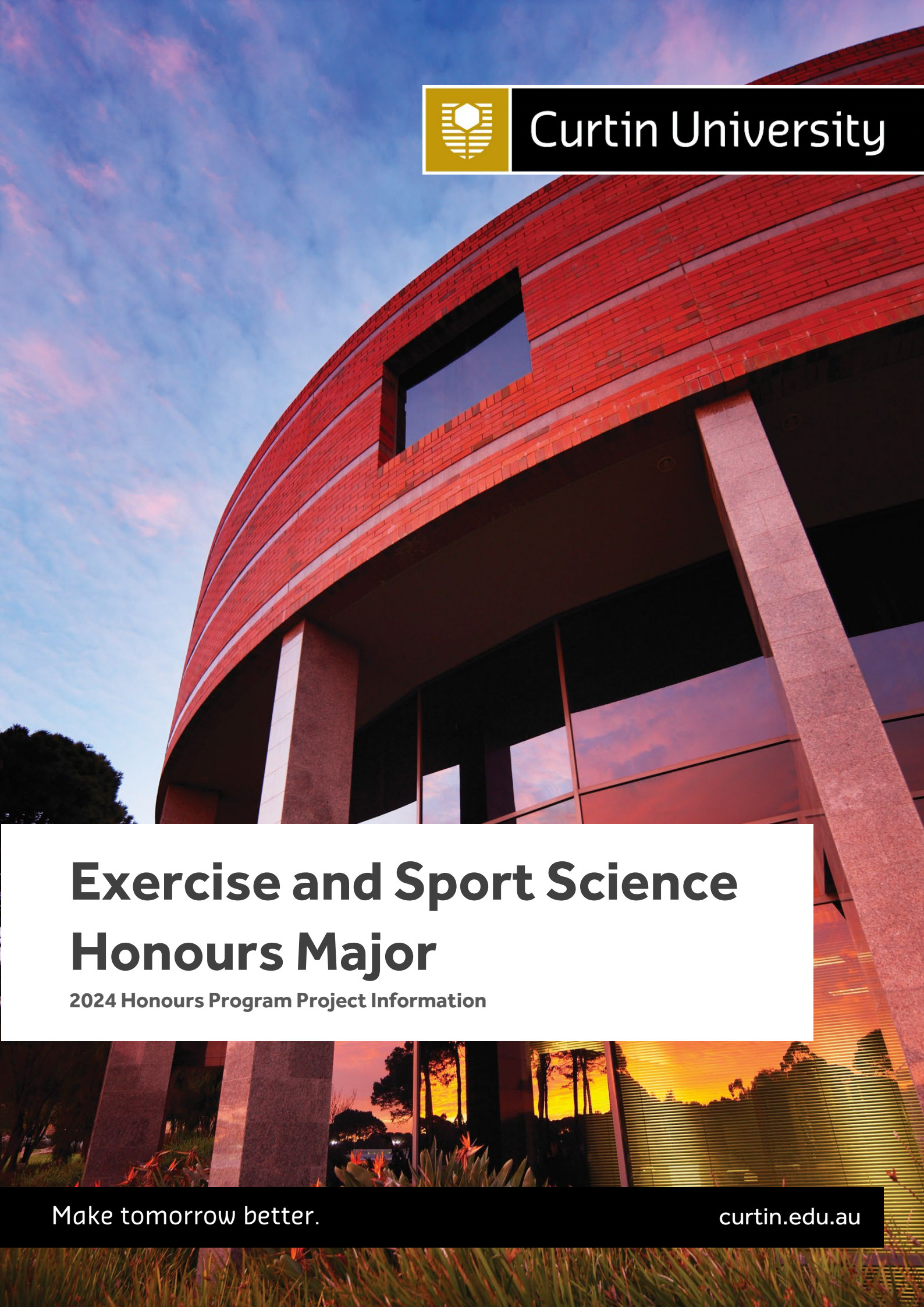

Curtin University

Exercise and Sport Science Honours Major

2024 Honours Program Project Information

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Welcome

The Bachelor of Science (Exercise and Sports Science) Honours course is specialised one year study program offered to students who have demonstrated a high level of academic achievement in their undergraduate degree.

The Honours year offers an opportunity to immerse yourself in a research topic and project within a domain in Exercise Science. Under the expert guidance of an academic supervisory team, you will work collaboratively to advance your research abilities and critical-thinking skills in preparation for your future career in Exercise and Sport Science and related research-focussed vocations.

If you have performed well in your undergraduate studies, have a capacity for defining and solving problems, enjoy discussing concepts, and exploring ideas, we encourage you to apply for program.

The Honours program allows you to further develop valuable knowledge and skills to enhance your employment opportunities. Many prospective employees view an Honours degree as an indicator of advanced skills, knowledge, and an ability to work independently. Honours program graduates demonstrate persistence, excellent verbal and written communication skills, exceptional project management skills, an ability to achieve a complex goal, independence, and autonomy in working towards a large task and competence working in team environments.

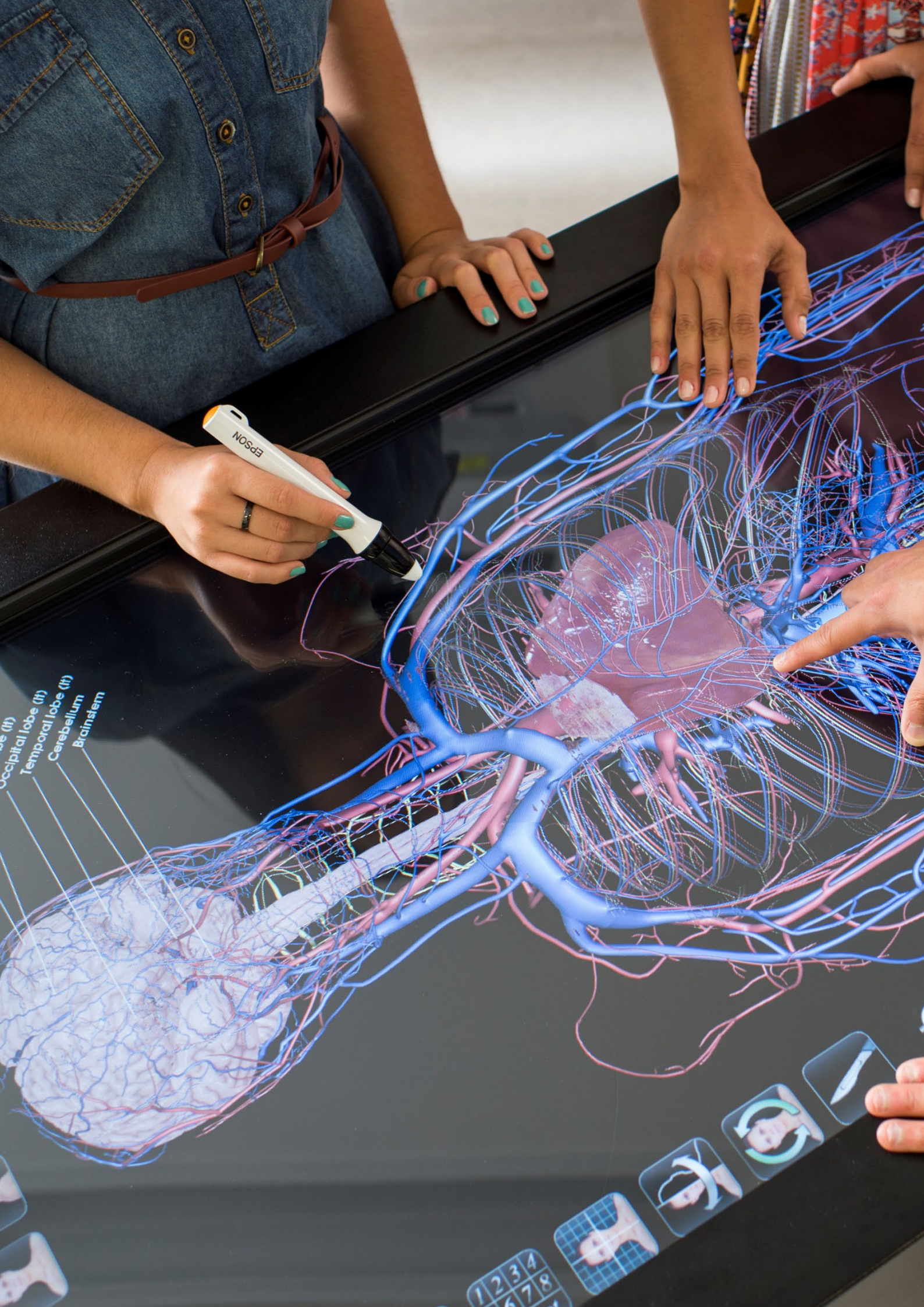
If you are successful in your application, we look forward to working with you and welcoming you into our supportive research community.

Exercise and Sport Science Honours
Program Coordinator

Dr Angela Spence

Senior Lecturer

angela.spence@curtin.edu.au


EPSON
Occipital lobe (lt)
Temporal lobe (lt)
Cerebellum
Brainstem

Application Process

We encourage you to review the available projects and researcher profiles listed under the Exercise and Sport Science themes in this booklet.

We then invite you to contact the primary academic supervisor(s) listed against each project/theme to discuss the project or their research areas in more detail, the skills you might bring to the project and your interest in the project/area.

In your application, please list your preferred project(s). As the Honours Program is highly competitive, we cannot guarantee your first project preference. Projects with external partners may also require an interview process prior to project allocation. Successful applicants will be notified by the Honours Program Coordinator of their allocated project/research theme and academic supervisory team.

About the School

Curtin's School of Allied Health offers professionally recognised courses in Exercise and Sport Science, Occupational Therapy, Physiotherapy, Social Work, and Speech Pathology.

The Faculty of Health Sciences follows a long tradition of discipline-based course delivery in the health professions. Courses in the faculty provide a hands-on approach to learning so you can make a real difference to people's lives. We are internationally recognised for our leadership in health research.

Working collaboratively with industry, the faculty focuses on providing practical solutions to global health challenges.

Our courses are recognised by industry and emphasise applied learning, to ensure our research and education is relevant and that you graduate highly employable.

Can handgrip exercise assist in early cardiovascular disease risk assessment?

Supervisory Team: Prof Luke Haseler Luke.Haseler@curtin.edu.au. Ms Anna Scheer

Project Description

Early detection of cardiovascular disease is critical for ensuring timely intervention to reduce the risk of adverse events occurring. Isometric handgrip exercise is being acknowledged as a potential 'test' for people at risk of cardiovascular disease. Isometric hand grip increases sympathetic activation, driving elevations in heart rate and blood pressure through sympathetic nervous system activation. Recent evidence has suggested that both the size and time course of these responses are important in differentiating people at risk of cardiovascular disease development. Determining the critical times for blood pressure and heart rate sampling during this procedure will allow this test to be conducted with standard blood pressure equipment, allowing it to be researched further as an option for routine health screening.

Methodology

This study will explore the effects of isometric exercise and post exercise cuff occlusion on continuous blood pressure, heart rate, total peripheral resistance and cardiac output responses using a NOVA Finapres machine. This study will look at the time course and magnitude of cardiovascular effects in healthy people and people at risk of cardiovascular disease.

Project Significance

Through establishing the time course of blood pressure and heart rate responses in different participant cohorts this research will help determine the optimum sampling windows to determine the presence of underlying cardiovascular disease. This will facilitate future research to convert this assessment into a simple clinical screening tool able to be done at any GP or rural health clinic.

Skills that will be Developed

During this project you will gain laboratory experience in employing handgrip isometric exercise protocols and using the NOVA Finapres system for the continuous monitoring of cardiovascular outcomes.

Project Feasibility

Our laboratory is equipped with a NOVA Finapres to assess blood pressure, heart rate, cardiac output and peripheral vascular resistance, and a Hokanson E20 rapid cuff inflator will be used for the post-exercise cuff occlusion protocols. A Jamar handgrip dynamometer and an electronic dynamometer will be used for the handgrip exercise. The project has human research ethic approval.

Enhancing human performance in hot thermal conditions

Supervisory Team: Dr Kagan Ducker kagan.ducker@curtin.edu.au, Dr Carly Brade

Project Description

Dr's Brade and Ducker lead the Curtin University Environmental Physiology Laboratory and our work involves assessing various methods of enhancing human performance in challenging thermal conditions. We currently have a PhD candidate working in the laboratory on a project assessing pre- and per-cooling techniques, and we hope to add to our research student numbers. The Honours student will be able to contribute to discussions about this project, which will involve some sort of countermeasures to maintain performance in hot conditions.

Methodology

Specific methods relating to each project, scope, and research questions will be confirmed. Generally, projects in this field will involve testing in the environmental chamber and will incorporate a variety of psychophysiological assessment techniques to understand performance in the diverse thermal environments.

Project Significance

Humans are often pushed to exercise in challenging thermal conditions, and our work aims to identify ways to help mitigate any negative effects and maximise human performance.

Skills that will be Developed

Students will develop their independent skills in participant recruitment, advanced physiological performance testing in laboratory-based settings, as well as skills to effectively analyse and report data collected during human research.

Project Feasibility

Our lab is well established, we have access to an environmental chamber, a variety of tools related to assessing exercise in the heat (e.g., core and skin temperature sensors, plasma volume assessment capability) and a research team that works effectively. .

Establishing a consensus approach to capillary blood glucose monitoring

Supervisory Team: Dr Ray Davey ray.davey@curtin.edu.au, Dr Angela Spence, Dr Carly Brade

Project Description

Despite the clinical application and ubiquity of capillary blood glucose monitoring in practice, there is currently no consensus on the procedures necessary to determine an accurate blood glucose reading using point-of-care blood glucose meters. This is due to conflicting evidence regarding the influence of certain methodological approaches on the accuracy of blood glucose readings. These methods include hand washing before the procedure, the use of alcohol (isopropyl) wipes to sterilise the puncture site and the blood drop number chosen for analysis. The purpose of this study is to address the influence of these factors on the validity of this procedure.

Methodology

The proposed study will include 50 participants randomised to a euglycaemic or a hyperglycaemic treatment. The euglycaemic treatment will involve undergoing blood glucose testing in the postabsorptive state (at least 4hrs after a meal) and the hyperglycaemic treatment will involve undergoing the same blood glucose testing procedures in the hyperglycaemic state (1hr after consuming a standardised 75g glucose solution). In both treatments, the participants will provide 8 capillary blood glucose samples from each fingertip, with each of the 8 sites prepared differently as described below: Hand 1: Washed with soap and warm water, Finger 1: no alcohol, drop 1, Finger 2: alcohol, drop, Finger 3: no alcohol, drop 2, Finger 4: alcohol, drop 2, Hand 2: No washing, Finger 5: no alcohol, drop 1, Finger 6: alcohol, drop 1, Finger 7: no alcohol, drop 2, Finger 8: alcohol, drop 2. The primary outcome measures are blood glucose readings obtained from each site. The readings will be analysed for clinically meaningful differences between sites to identify methodological approaches that may influence the validity of the readings.

Project Significance

This study will identify factors that influence the validity of blood glucose readings obtained by capillary blood glucose monitoring. This will provide immediately translatable evidence-based guidelines for allied health professionals routinely performing this procedure in practice. This is an important issue to address since clinical recommendations are made based on these readings.

Skills that will be Developed

Students will develop skills in all facets of applied research including conducting a comprehensive review of the literature, liaising with participants and members of the research team, collecting, and analysing data, and interpreting and presenting research findings.

Project Feasibility

This study is highly feasible with funding available for equipment and consumable items and access to a laboratory at Curtin University to complete the testing procedures.

Evaluating arterial endothelial function across the menstrual cycle

Supervisor Team: Dr Angela Spence angela.spence@curtin.edu.au, Dr Carly Brade

Project Description

Studies suggest that oral contraceptive (OC) use increases the risk of atherosclerosis and thromboembolic events in otherwise healthy, reproductive-aged females. Oestrogen is 'cardioprotective' however, it is not unclear how temporal fluctuations in steroid sex hormones impact markers of cardiovascular function, specifically endothelial function. Furthermore, the interaction between exercise, sex hormones and vascular adaption is poorly understood. As endothelial dysfunction is a precursor to atherosclerotic disease, the overall aim of this study is to determine whether cyclical fluctuations in female sex hormones may influence endothelial function across the menstrual cycle, both natural and hormonally controlled, in female participants, and establish the impact of exercise on artery structure and function.

Methodology

Participants will undergo temporal, non-invasive measures of brachial artery function using high-resolution Duplex ultrasonography. Naturally cycling participants will undergo menstrual cycle tracking, including cycle day and symptomology will be recorded using a daily online diary. Urinary luteinising hormone analysis will assist in estimating ovulation, while venous sampling will quantify oestrogen and progesterone as per best-practice guidelines for menstrual phase determination. A subgroup of participants will engage in an 8-week exercise training intervention to investigate the impact of exercise, menstrual cycle phase and serum hormone (oestrogen and progesterone) on arterial parameters.

Project Significance

Healthy, reproductive-aged female participants are often deemed as 'low risk' for cardiovascular disease yet remain grossly under-represented in scientific and medical research. This study aims to exclusively evaluate female cardiovascular health outcomes, which is a highly topical and relevant research priority area.

Skills that will be Developed

Students will develop skills using non-invasive vascular ultrasonography and phlebotomy in addition to conducting comprehensive review of the literature, participant recruitment, organisation and logistics of data collection, data analysis, interpretation, written and oral presentation of research findings.

Project Feasibility

This project is part of an ongoing research program within the Curtin School of Allied Health, with institutional Ethical Approval already received. All facilities, training and infrastructure will be provided.

Evaluations of exercise intensity and fitness during Frame Running for people with physical disability

Supervisory Team: Dr Sian Williams sian.williams@curtin.edu.au, Dr Carly Brade, Dr Noula Gibson (Perth Childrens Hospital)

Project Description

Frame Running is an innovative sport for people with a physical disability who have impaired balance and who are not able to functionally run independently. A Frame Runner trike is a custom built three-wheeled frame where the runner is fully supported by a saddle and leans against a chest support, propelling themselves forward by the feet (one or both), while using the hands and/or arms to steer. Frame Running has created new opportunities for people with physical disability to participate in sport and in engage in physical activities at higher levels of intensity then previously afforded to them, and as a result, to also experience the associated health and social benefits. As a developing sport, there is still much to learn about exercise prescription and performance for people with physical disability in Frame Running. The aim of this study is to evaluate exercise intensity during Frame Running, and in doing so, will seek to establish i) suitable field-based measures of intensity, ii) document values of exercise intensity reached during frame running, and iii) link exercise intensity with performance outcomes.

Methodology

People with physical disabilities taking part in a Frame Running program will be invited to take part in the study. This could include children and people of all ages with cerebral palsy, or any other physical disability requiring assistance to walk or run. Field and/or lab-based measures of exercise intensity and fitness will be utilised to evaluate intensity through the Frame Running sessions, with the possibility of evaluating intensity in relation to performance.

Project Significance

Outcomes of this study will help to improve our understanding of the measurement, attainment and outcomes associated with exercise intensity during Frame Running, which may be used in future prescription, training and evaluation of health and performant related outcomes.

Skills that will be Developed

The student undertaking the project will learn to apply and develop their skills in exercise and health assessment in people with a diverse range of physical abilities.

Project Feasibility

The supervision team have combined expertise in disability, sport and evaluation of exercise intensity. Dr Gibson (Senior Physiotherapist at Perth Childrens Hospital, and Frame Running coach) has strong links with Frame Running in Perth and will facilitate links for recruitment. Resources required for the assessment of intensity and performance are available at Curtin University.

References

Voltolini et al. What Do We Know about Frame Running? A Narrative Review. Curr. Sports Med. Rep. 21(12):p 448-453, Dec 2022. | DOI: 10.1249/JSR.0000000000001018

Exploration of the health impacts of augmented reality use with children

Supervisory Team: Associate Prof Amity Campbell a.campbell@curtin.edu.au, Dr Juliana Zabatiero, Dr Sarah Stearne

Project Description

The aim of this project is to explore the short-term physical impacts of augmented reality use in young children (4-8 years old).

Methodology

This project will include a field-based data collection at a Perth playground where augmented reality is already implemented. The children will be asked to use a head mounted virtual reality system as well as handheld phone-based system.

The outcome variables of interest will include accelerometry derived measures of movement and posture and survey-based assessment of fun/engagement.

Project Significance

Digital technologies are embedded within children's lives and offer potential benefits in relation to education and social connection, but also potential risks for children's health, wellbeing, and development. These benefits and risks are yet to be clearly understood. Currently, information about technology use and children's health, wellbeing and development outcomes focuses on traditional screen-based digital technologies such as television and computers, with little information on contemporary technology such as augmented reality. Evidence is needed to build an understanding of how children engage with these modern technologies and what movement-based impacts this use might have.

Skills that will be Developed

Students will be collaborating in an experienced, multi-disciplinary team, and develop skills in the collection and interpretation of quantitative data as well as qualitative data collection.

Project Feasibility

This project is embedded in the Digital Child centre of excellence. The student will work with the Curtin members of this team. We have access to all resources and expertise required for this project.

Game and training performance analysis to inform representative conditioning

Supervisory Team: Mr Steve Tidman stephen.tidman@curtin.edu.au Dr Dale Chapman, Mr Jake Shaw (Claremont Football Club)

Project Description

The concept of individualisation of training to maximise the adaptive response is as important for team sport athletes as it is for individual sporting pursuits. However due to the complexity inherent in competition (e.g. application of playing style, tactics and responding to an opponent's movements) the effectiveness of individual athlete programming needs to also account for player position and playing style differences. Through application of a representative learning design framework this project will explore how current training session drill design is representative of specific match components (e.g. defensive 50 exits). The derived information will be positioned and interpreted in the context of player position demands and qualitatively against coach perceptions of playing style requirements.

Methodology

Through the project the student will gain a strong understanding of how to use sports code and the GPS analytical tools to record and derive important contextual information. The student will also learn relevant statistical techniques such as Linear Mixed Modelling to compare between drills and competition information.

Project Significance

This project has been designed in conjunction with Claremont Football Club and extremely relevant to their requirements. It will assist in solving a real-world problem that is limiting the optimisation of their player preparation practices.

Skills that will be Developed

The student will be expected to gain a strong working understanding and use of R studio for both the data processing, statistical analysis, and the visualisation.

Project Feasibility

This project is to be run in collaboration with Claremont Football Club and is highly feasible, with all infrastructure and resources in place to support the project.

Improving access and uptake of physical activity in an Aboriginal community

Supervisory Team: Prof Andrew Maiorana a.maiorana@curtin.edu.au Associate Prof Eleanor Quested, Dr Jonathon Bullen

Project Description

Regular physical activity (PA) is important to good health, but many Aboriginal adults don't undertake enough PA for health benefits, increasing their risk of conditions like heart disease and diabetes. The project will collaborate closely with an Aboriginal community to empower them to develop and implement new programs that improve access to and participation in PA. Because the programs will be community-led, they will be designed to meet local needs and priorities. We will work closely with partner organisations within Aboriginal community to implement the co-designed programs and develop strategies to make the programs sustainable beyond the period of the Honours project.

Methodology

The project involves Community Participatory Action Research, which is best practice for research involving Aboriginal communities as it includes the community as an active partner. The project will involve the follow methods: Co-design of culturally safe PA programs and assessment methods; Feasibility and pilot testing of the co-designed initiatives; Application of implementation science principles to support the development of implementable and sustainable PA programs in the trial community and support future 'scale-out' to other communities."

Project Significance

Aboriginal Australians experience chronic disease at a higher rate and younger age than non-Aboriginal Australians., meaning a life expectancy gap experienced by Aboriginal Australians. In Indigenous adults aged 18–64, only 38% met the moderate intensity PA guidelines and only 13% met the strength-based activity guidelines. Regular PA is critical to reduce the risk of chronic disease and help to keep people healthy if they already have a chronic condition.

Skills that will be Developed

Aboriginal community engagement, cultural awareness training and PA design, delivery and evaluation are additional skills developed during the project.

Project Feasibility

The project is complementary to a PhD project for which a PhD scholarship is currently being advertised. The project supervisor works closely with several Aboriginal community organisations (Ngurra Kujungka, Fair Game, Geraldton Sporting Aboriginal Corporation and Swan Districts FC Social Engagement Team) that all engage with Aboriginal communities to support them in sporting and PA initiatives. These partnerships will make the project highly feasible. The Honours project will be a component of this larger body of work and will be involved with one partner organisation and Aboriginal community.

Improving player match and training availability by better understanding high-speed running volume

Supervisory Team: Dr Dale Chapman dale.chapman@curtin.edu.au Prof Kevin Netto, Dr Brad Keller (Fremantle Football Club)

Project Description

The aim of this research project is to understand how the volume of high-speed interval running efforts completed during the preseason relates to and informs the players match and training availability during the season. The study will firstly quantify the high-speed running completed during pre-season using predetermined velocity bands to categorise training. Using this information and secondary variables of isometric mid-thigh pull strength, countermovement jump performance and Nordic hamstring curl strength players match and training availability predicted. There is the potential for multiple projects within this theme so please contact the supervisory team for more details.

Methodology

This project will use wearable technology to collect velocity data during Australian football training and matches to determine the volume of high-speed running. While data collection of the secondary variables will include use of portable force plates (Hawkins Dynamics) with associated software, and the VALD system Nordboards for collecting the nordic hamstring curl strength data.

Project Significance

The project theme has been directly identified by our industry partner, Fremantle Football Club, to better inform the training practices of the club for their athlete preparation.

Skills that will be Developed

Students will develop skills and knowledge of micro sensor and GPS signal analysis and will gain specialised skills in portable force plate use in various scenarios all the while gaining experience in the high-performance sports team environment and the translation of sport science analysis into training program design. The supervisory team would hope that the student will be willing to learn processes in R studio and guidance will be provided to achieve this.

Project Feasibility

All resources are currently available through the linkage and partnership with Curtin University and Fremantle Football Club. There is scope that the project could lead to the development of future PhD project on successful completion.

Optimising change-of-direction performance using a neurocognitive and motor dual-task approach

Supervisory Team: Mr Steve Tidman stephen.tidman@curtin.edu.au Dr Dale Chapman, Dr Peter Edwards, Mr Jake Shaw (Claremont Football Club)

Project Description

The ability to execute change-in-direction manoeuvres (e.g., sidestepping) are a critical movement skill in Australian football. Executed in response to player movements in the surrounding environment , change-of-direction (COD) manoeuvres allow a footballer to gain positional advantage over their opponents. However, COD manoeuvres are typically trained in conditions that ignore the perceptual and cognitive demands found during competition. This project will examine the effectiveness of a visual dual-task training intervention on COD performance in state-level (sub-elite) Australian football players, when compared to traditional training intervention.

Methodology

Through the project the student will gain a strong understanding of current strength and conditioning practices in elite sport. The student will also develop a deeper understanding of how strength and conditioning practices can be further optimised within performance and injury prevention frameworks.

Project Significance

COD manoeuvres are an important determinant in multi-directional sport performance but have also been associated with increased risk of serious knee injury (i.e., ACL rupture). The current study will help determine that efficacy of including perceptual-cognitive demands into established strength and conditioning practices to optimise COD performance, and potentially reduce the risk of knee injury in Australian Rules football.

Skills that will be Developed

The student will be expected to gain a strong working understanding of current gold standard strength and conditioning practices. The student will also be required to develop a general understanding of R Studio for both the data processing, statistical analysis and data visualisation.

Project Feasibility

This project is to be run in collaboration with Claremont Football Club and is highly feasible, with all infrastructure and resources in place to support the project.

Performance progression in diving

Supervisory Team: Prof Kevin Netto kevin.netto@curtin.edu.au , Dr Dale Chapman, Ms Sheila Galloway (WAIS)

Project Description

In men's diving the number of twists and somersaults have continued to increase across dive difficulties and competitions. This is not the case in women's diving which has seen acrobatic complexity stagnant or in some cases regress. Is there a biomechanical reason for this?

Methodology

This project will involve the analysis of publicly available footage of high-level diving competition. We would also like to explore coaching and athlete impediments to increasing the complexity of acrobatic movements in women's diving.

Project Significance

This project will give real-world insights into impediments to performance progression in women's diving.

Skills that will be Developed

The student will develop biomechanical analysis and motor skill development expertise. They will gain motion analysis skills as well as exercise intervention knowledge.

Project Feasibility

This project will be working with the WAIS.

Reliability of the Athletic Shoulder (ASH) test in Australian Rules Footballers

Supervisory Team: Dr Peter Edwards peter.edwards1@curtin.edu.au, Dr Jay Ebert (University of Western Australia)

Project Description

Maximal isometric tests are commonly used to assess strength and strength asymmetries following injury or surgery to establish readiness to return to play. Isometric tests in the upper limb are frequently used in clinical practice to assess neuromuscular performance of the shoulder joint in sports involving contact / collision and overhead actions. The aim of this study is to determine the reliability of the Athletic Shoulder (ASH) test in Australian Rules Footballers.

Methodology

Male footballers who are actively competing in the Perth Amateur Football League (PAFL), Western Australian Football League (WAFL) and Australian Football League (AFL) will be invited to participate. Participant demographics relating to age, sex, anthropometrics (height, weight, body mass index – BMI, limb length), medical history, limb dominance, sport and level will be collected. Following a warm-up, participants will perform the ASH Test, a long lever isometric upper limb test that assesses peak force, rate of force development (RFD) and impulse over a 5 second maximal effort. Specifically, the ASH test involves the patient lying prone on the floor, their forehead rested on a foam block, with the evaluated hand placed on a vertical axis force plate. The test involves three trials per limb in three positions of shoulder abduction: the I-test position, whereby the shoulder is positioned in full abduction (in line with the body) and the elbow fully extended; ii) the Y-test position, whereby the arm is placed in 135° of shoulder abduction and the elbow fully extended; and iii) the T-test position, whereby the arm is placed in 90° of shoulder abduction and the elbow fully extended. On day 1, participants will perform the ASH test in each shoulder position, with the order of testing randomized. On day 2, the participants performed the same 3 tests in a randomized order to assess reliability.

Project Significance

Establishing reliability of the ASH test, and certain force-time variables within this test, in Australian Footballers will reinforce its use as an assessment method to quantify an athlete's readiness to perform in sports that require repeated or high intensity upper limb actions, following upper limb injury or surgery.

Skills that will be Developed

Skills students can develop during this project, include return to sport testing delivery and interpretation in athletes and an introduction to clinical cases (i.e. following injury or surgery).

Project Feasibility

Equipment and resourcing including ForceDecks from VALD Performance will be available to use at Curtin University. This study will be complimentary to existing research of the supervisory team.

School Researcher Profiles

Supervisor: Prof Andrew Maiorana (a.maiorana@curtin.edu.au)

Broad Research Areas

My research addresses the role of exercise in the prevention and management of chronic disease, with a specific focus on cardiovascular conditions. I have a keen interest in exercise and physical activity in Aboriginal people, and how exercise can be applied to provide psychosocial, physical and health benefits. I'm currently undertaking several studies in these areas that have the opportunity for an Honours student to become involved in. Alternatively, there are a range of study ideas that I have that would suit a discrete Honours project. I'm also open to prospective students proposing their own study if there is an idea, they have in mind that they'd like to develop into study for Honours.

Some examples of potential projects are as follows:

- Applying new and innovative approaches to improve patient outcomes in cardiac rehabilitation.
- Quantifying exercise physiology in people born with a congenital heart condition.
- Validating wearable devices to measure physical activity, and physiological responses, to vocational tasks and in people with chronic conditions.

Proposed Methodologies

My research employs a variety of methodological approaches ranging from small sample pilot studies to large scale randomised control trials. These studies use a range of different interventions and assessment methods, including: 1. Exercise testing and training (through access to exercise physiology facilities based at Fiona Stanley Hospital), 2. Surveys and questionnaires, 3. Focus groups.

Supervision Philosophy

I provide a supportive environment for students and encourage them to be part of my wider research team. Depending on the project they may be embedded into clinical teams at Fiona Stanley Hospital, work closely with other Honours or HDR students I supervise, or work more independently under my supervision. I typically meet fortnightly with students, but this varies depending on the nature of the project and the level of support the student requires.

Supervisor: Dr Angela Spence (angela.spence@curtin.edu.au)

Broad Research Areas

My research themes include cardiovascular and exercise physiology with a special interest in female-specific physiology. Optimising exercise prescription approaches for girls, women and female athletes across the reproductive lifespan is the primary area of focus for research studies.

Proposed Methodologies

Non-invasive in vivo imaging including vascular ultrasound; exercise interventional studies using classic aerobic/endurance and resistance-based programs.

Supervision Philosophy

Together with students I strive to maintain a balance between setting clear and appropriate guidelines, discipline and focus to tasks, while encouraging and working towards independence in thought and action. Open, clear and constructive communication is my preferred approach, including regular (weekly, or fortnightly at a minimum) meetings, I pride myself in developing students' knowledge, skill and confidence in their research experience. I am hands-on in training, as many of projects require a specific practical skillset (i.e. exercise testing, ultrasonography, phlebotomy, exercise interventions). As I invest substantially in students learning experience, I set clear expectations of reciprocating the investment into their research studies.

Supervisor: Dr Carly Brade (carly.brade@curtin.edu.au)

Broad Research Areas

My research areas include sport Physiology/Sport Performance; Environmental Physiology specifically heat acclimation/acclimatisation and/or precooling and cardiac and vascular responses to exercise and training

Proposed Methodologies

Intervention and in-vivo human experimental designs are my area of expertise.

Supervision Philosophy

Collaboration is vital to success in the Honours year. With co-supervisors, we create and have a team approach where we take on the roles of colleagues as opposed to student/supervisor. Regular meetings and hands-on training in the lab ensure all students have the support and are provided with the direction and guidance required to be successful.

Supervisor: Dr Dale Chapman (dale.chapman@curtin.edu.au)

Broad Research Areas

My research centres primarily on studies of the form and function of human skeletal muscle. Skeletal muscle is responsible for all human movement during physical activity and exercise. As a result, my research is aligned across the Allied Health spectrum as I seek to transform human health through the science of high performance. Specifically, using athlete and recreationally active people research models to study the applied physiology of strength and conditioning and particularly the neuromuscular mechanisms that explain changes in muscle strength, size, and function. Research is conducted during periods of growth and development, aging and sarcopenia, resistance training, fatigue, recovery, and dietary supplementation. We use our evidence-based information on skeletal muscle form and function to address contemporary problems, discover innovative methodologies, and translate our findings to both high performance sport and the general population.

Proposed Methodologies

A range of techniques and equipment are used across the topic areas and themes identified above including:

- Various filed sport testing equipment e.g. infra-red timing gates
- Portable and inground force plates
- Isokinetic dynamometry
- Micro-sensors and GPS tracking
- Various ergometers and treadmills

Supervision Philosophy

You learn best through doing and having a direct connection with the data that you are seeking to interpret. The research student process is collaborative where you have the ownership of the outcome but where we share an interest in the achievement of the outcome.

Supervisor: Dr Kagan Ducker (kagan.ducker@curtin.edu.au)

Broad Research Areas

My primary focus is on projects in thermal physiology, the Impact of body composition and shape on athlete health and exercise performance and the physiology of SCUBA diving.

Proposed Methodologies

Student will be working actively in the lab and environmental chamber assessing physiological responses in athletes using various markers and methods.

Supervision Philosophy

As an ESSA Accredited Sports Scientist Level 2, my role is a practical mentoring one, particularly for students who are aiming to head down the sports science pathway to potentially become ESSA Accredited Sports Scientists (Level 1). The supervision teams I and I work in are supportive and we bring you into our research team as an active partner. Our team of academics and postgrads in our team will help to train you as required to upskill you. Our meetings tend to be online and/or we go grab a coffee each week to talk about progress and plans. It's a different experience to being an undergrad as there is one of you and multiple academics and postgrads supporting you.

Supervisor: Prof Kevin Netto (kevin.netto@curtin.edu.au)

Broad Research Areas

Kevin's background is in biomechanics and mechanical engineering. He focuses on understanding and enhancing physical human performance in challenging environments. This knowledge allows for the optimisation of movement and skill in both sporting and occupational tasks. He concentrates on applied and translational research that defies the confines of a laboratory.

Proposed Methodologies

Kevin uses biomechanical techniques such as kinematic, kinetic and electromyographic approaches to assess, augment and enhance occupational and sporting performance.

Supervisor: Prof Luke Haseler (Luke.Haseler@curtin.edu.au)

Broad Research Areas

I am an exercise physiologist who applies an integrative physiology approach to the study of human skeletal muscle and cardiovascular physiological responses to exercise in both health and disease. A major focus of my research is understanding the mechanistic basis for the role of exercise in the treatment of complex pathologies such as chronic heart failure and chronic obstructive pulmonary disease. Additional areas of research include the effect of acute hypoxia on muscle function during exercise, and high intensity exercise induced cardiac fatigue.

Current research themes are as follows:

- Optimising the breathing muscles to enhance human exercise performance.
- Using isometric exercise as a method to assess diastolic dysfunction and in early detection of cardiovascular disease.
- Exercise training the limb and breathing muscles as a non-cardiac therapy in heart failure with preserved ejection fraction.
- Assessment of ventricular mechanics during high intensity exercise induced cardiac fatigue.
- Non-invasive measurement of muscle mitochondrial function during exercise.

Proposed Methodologies

I employ a range of methodologies to measure the physiological responses to exercise including:

- Finapres assessment of beat-by-beat blood pressure, heart rate, cardiac output, and peripheral vascular resistance.
- Near Infrared Spectroscopy (NIRS) to measure muscle perfusion and mitochondrial function.
- Echocardiography and exercise testing and training at Fiona Stanley Hospital.
- Magnetic resonance imaging and spectroscopy.

Supervision Philosophy

I aim to provide a positive learning environment for students with an emphasis on understanding sophisticated experimental techniques and interpreting the data acquired, from an integrative physiological perspective. The importance of a collaborative approach to research will be highlighted and a hands-on approach to learning the specific methodologies will be provided. Students will be encouraged to become part of the broader research team. I meet weekly or fortnightly with students, depending on the nature of the project, stage of research, and the level of support required.

Supervisor: Dr Peter Edwards (peter.edwards1@curtin.edu.au)

Broad Research Areas

My research is focused on improving patient outcomes prior to, and/or following orthopaedic surgery. In general, my research interests are:

- Rehabilitation for musculoskeletal conditions
- Pre / post-surgery exercise rehabilitation
- Return to sport and athletic performance optimisation
- Injury prevention
- Digital health

Proposed Methodologies

My research employs a variety of methodological approaches ranging from small cohort studies to randomised control trials. These studies use a range of different interventions and assessment methods, including:

- Exercise rehabilitation with and without augmented training modalities
- A variety of clinical and athletic assessment from standard clinical tests, through to more in depth biomechanical (force plates, EMG etc) and strength (isokinetic dynamometry) evaluations.

Supervision Philosophy

I am very much a collaborative and hands-on supervisor, whilst at the same time, encouraging students to get their hands dirty to optimise their own set of skills and milk everything out of a project as possible. This relates to everything from data collection and participant interaction, through to data analysis and dissemination.

Supervisor: Dr Ray Davey (ray.davey@curtin.edu.au)

Broad Research Areas

My primary area of interest is understanding blood glucose responses to exercise in type 1 diabetes. I have interests in the prevention of exercise-mediated hypoglycaemia and the development of evidence-based guidelines for exercise for people with type 1 diabetes.

Proposed Methodologies

I employ a several methodologies including:

- Blood glucose clamping
- Real-time continuous glucose monitoring
- Exercise testing with indirect calorimetry

Supervision Philosophy

My philosophy is to encourage interest and inquiry and to be supportive in helping students to understand the research process.

Supervisor: Steve Tidman (stephen.tidman@curtin.edu.au)

Broad Research Areas

My research focuses on the perceptual-cognitive expertise underlying skilled performance in sport, and how vision modulates movement control in both athletes and clinical populations.

Proposed Methodologies

My research uses a range of techniques and equipment including:

- Virtual reality
- 3-D Motion Analysis
- Electromyography
- Force plates
- Eye-tracking

Supervision Philosophy

My philosophy revolves around fostering a positive and supportive team atmosphere, enabling students to openly discuss their ideas, difficulties, and goals. Regular team meetings will stress the significance of clear communication and offer the assistance needed for enhancing your academic and research abilities.

Supervisor: Dr Sian Wiliams (sian.williams@curtin.edu.au)

Broad Research Areas

The primary focus of my research relates to: - Paediatric disability (predominantly cerebral palsy), - Rehabilitation and physical activity, and - Muscle morphology and function. The key focus of my research over the last few years has centred on the early detection of cerebral palsy and the generation of new knowledge around current practice and early intervention to improve health outcomes. Further to this, I have also been working to understand impaired muscle growth (using 3D ultrasound) in infants born prematurely and at risk of neurological injury (at risk of CP), seeking to understand the relationship between delayed/impaired musculoskeletal growth, motor development, and neurological injury.

Proposed Methodologies

Research methods will vary depending on the research question, but some of my more recent methodologies used include:

- 3DMA (gait analysis, kinematics, kinetics)
- DXA (body composition)
- Using MRI and 3D Ultrasound to measure muscle volume;
- Functional strength measures
- Qualitative interview
- Co-design, surveys, systematic, scoping and narrative reviews
- General Movements Assessment

Supervision Philosophy

Working with the clinical populations, I place a high value on conducting meaningful research to a high standard, to respect the time and efforts (and needs) of the participants at the centre of the study. Early in the supervision process I like to work with my students to develop a clear structure and plan for their research so that they can have a clear overview of what they need to achieve and when. I tend to provide a lot of early feedback and hands-on support/training, which then turns more into a coaching type of model to develop the students' independence and ownership of their work.

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