



“The most rewarding part of my job is working with children in the laboratory – creating novel experiments, trouble-shooting measurement challenges and making the research fun.”

McManus’ research focuses on the ways in which cardiopulmonary and cerebrovascular responses to exercise differ between children and adults.

McManus and her team use various experimental conditions such as prolonged sitting and hypoxia to alter the cardiopulmonary and cerebrovascular responses to exercise and use this information to decipher the mechanisms that underlie developmental differences

Children are not mini-adults and differ from adults in how they take in, transport and use oxygen at rest and during exercise.

Many children suffer from a number of disorders which share something in common - that the ability to take in, transport or use oxygen is limited, and their ability to function well, particularly during exercise, is impaired. Equally, when children experience long periods of sedentary behavior, their ability to exercise also becomes impaired. By challenging the cardiopulmonary and cerebrovascular systems with exercise under varying conditions, documenting who copes well, who doesn't and why, McManus and her team hope to develop more effective exercise treatments for children.

Main Focus Area

1. Determine the underlying mechanisms regulating the cardiopulmonary and cerebrovascular response to exercise in the child and how this alters with age and maturation.
2. Develop and test novel exercise intervention strategies in the child and adolescent.



ALI MCMANUS

About

Dr. Ali McManus developed her interest and excitement in pediatric exercise physiology while completing her doctorate at the world-renowned Children's Health and Exercise Research Centre at the University of Exeter U.K. Following the completion of her PhD, McManus took up a faculty position at the University of Hong Kong. Developing a research perspective that exercise could play a critical role in understanding, as well as moderating, clinical disease, she expanded her research to a number of important clinical populations including obese children, children with congenital heart disease and children who contracted the SARS coronavirus. In 2013, McManus joined the School of Health and Exercise Sciences at UBC Okanagan, where she has developed her program of research further through the assessment of cerebrovascular function in the child. In the last five years, McManus has secured significant funding (NSERC, CIHR, Heart & Stroke Foundation, Stober Foundation) to support and encourage these research endeavors. As current Editor-in-Chief of Pediatric Exercise Science, McManus is dedicated to actively contributing to the field.

Research Environment

McManus directs the Canadian Foundation for Innovation funded Pediatric Inactivity & Exercise Physiology Research Laboratory (PERL) within the School of Health and Exercise Sciences. PERL uses cutting-edge non-invasive techniques such as dual x-ray absorptiometry (DXA), respiratory gas analyses, prospective gas targeting, high-resolution Duplex ultrasound and near infrared spectroscopy. McManus is dedicated to providing mentorship to research students within her internationally oriented lab. Home to the International Pediatric Journal Club, McManus and her team welcome pediatric exercise focused scientists across disciplines to contribute to discussions of advancements in the field, and would encourage applications from talented and high achieving students from Canada and around the world for graduate and post-doctoral positions.

Next Stages

McManus and her team are currently running community intervention studies, to complement their experimental work with children in the lab. She is the Canadian lead on a UK-Canada team grant investigating whether the use of wearable technology and apps can support the delivery of home based exercise interventions in type 2 diabetics. The plan is to develop this for broader use in delivering exercise intervention in adolescents. She is also working closely with community partners to share the knowledge generated by PERL.



FEATURED PROJECT

Kids With Altitude Explores Physiological Adaptation to High Altitude in Lowlander Children

In the summer of 2019, McManus convinced 10 Kelowna children to travel with their parents to the high altitude White Mountain Research Station in California. This Research Station was founded in 1950 and is located at 3811metres. It has been the site of many seminal studies that have formed much of our understanding of the physiology of acclimatization in adults. This study was the first time in the 69-year history of the White Mountain Research Station that a study into the physiology of acclimatization in children has been conducted. McManus brought together an international team from Canada, the UK and the USA in a unique study of child-adult differences in integrative cardiopulmonary and cerebrovascular responses to acute and prolonged high altitude exposure. No previous studies have reported or tracked the integrative physiological responses to high altitude acclimatization, combining multiple cerebrovascular, cardiac, cardiopulmonary and skeletal muscle measures at rest and during exercise. This was one of the most intense programs of testing McManus and her team has ever conducted with children, but probably the most exciting research study they have undertaken.

TO LEARN MORE:

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