C-PAN

Centre for Physical Activity and Nutrition Research

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NUTRITION LEADERSHIP PROGRAM AND FREE SEMINAR

Deakin University's School of Exercise and Nutrition Sciences, and the Centre for Physical Activity and Nutrition Research (C-PAN) is hosting the inaugural Australian Nutrition Promotion Leadership Program (ANPLP) in Melbourne in December. The aim of the ANPLP is to bring together early career researchers and academics working in areas such as nutrition promotion, public health nutrition, nutritional epidemiology and related fields to provide leadership and communication skills training, career development support and networking opportunities. 69 people have been selected to participate.

One of the presenters at the ANPLP will be Dr Corinna Hawkes, Head of Policy and Public Affairs for World Cancer Research Fund International. Corinna has worked internationally for 15 years analysing and promoting food system and food policy solutions for better nutrition, healthier eating and improved public health.

In addition to speaking at the ANPLP, Dr Hawkes will present a **FREE SEMINAR** aimed at policy makers, health professionals, community workers and others on **Thursday 11 December 2014**. Her presentation will focus on how policy can support healthy food provision, drawing on lessons learned from a global perspective. Register at eventbrite.com/e/how-can-policy-support-healthy-food-provision-dr-corinna-hawkes-tickets-13837976761.

SUPPORT US

Our research is focused on making a difference to health and quality of life. Your support helps our team of committed and passionate researchers to continue to test new ideas, publish exciting findings and create innovative programs that will improve the health of all Australians. If you are passionate about health and would like to explore opportunities to support us, please email cpan@deakin.edu.au.

IN THIS ISSUE

GROWING HEALTHY MUSCLES TO OPTIMISE METABOLIC HEALTH INTO ADULT LIFE

Research has shown that skeletal muscle mass and strength are predictors of metabolic health and longevity. C-PAN researchers recently prepared a review article which highlights the importance of maternal nutrition and exercise during pregnancy to optimise skeletal muscle development and growth in the foetus, thereby maximising metabolic health of the offspring into adult life.

Growing evidence indicates that sub-optimal nutrition during pregnancy affects the development of skeletal muscle in the foetus, which leads to reduced muscle strength and poorer metabolic functions into adult life. This is because skeletal muscle development ends around birth in most mammals, including humans. Therefore, if the foetus does not receive optimal nutrition when muscle tissue is being constructed *in utero*, muscle function is permanently impaired with long-term negative consequences for metabolic health lasting into adult life.

Most of the evidence to date in support of this phenomenon comes from studies of individuals exposed to maternal under-nutrition *in utero*. However, C-PAN researchers and others have begun to show that maternal obesity and/or excessive gestational weight gain can be just as detrimental as under-nutrition for skeletal muscle development. More specifically, studies in rats and sheep have shown that muscle quality is impaired in offspring born to obese mothers. This is characterised by a reduction in muscle fibre number, a determinant of muscle mass, together with excessive accumulation of fat within muscle tissue. Excess fat in muscle can reduce muscle strength. It is also associated with insulin resistance, a condition that precedes type 2 diabetes. There is some evidence that the same occurs in humans.

Such biological evidence highlights the need to target maternal nutrition to optimise skeletal muscle development and health of offspring into adult life. Understanding the underlying cell and molecular mechanisms that may be involved would help to develop targeted preventive and/or curative therapies. Maternal exercise interventions may also prove beneficial. This is currently being investigated within C-PAN.

Reference

1. Bayol SA, Bruce CR and Wadley GD. Growing healthy muscles to optimise metabolic health into adult life. *Journal of Developmental Origins of Health and Disease*. In Press.

Key messages

Skeletal muscle development ends around birth.

Sub-optimal maternal nutrition or obesity during pregnancy affects skeletal muscle development with negative consequences on metabolic health lasting into adult life.

Maternal nutrition and exercise interventions during pregnancy may help to optimise skeletal muscle development, growth and health into adult life in offspring born to malnourished or obese mothers.

Funding acknowledgement
Deakin University, C-PAN.

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WHO'S LOOKING AFTER MUM? A TRIP TO BETTER DIABETES PREVENTION

Taking research from the bench to bedside is the goal for most research activity, yet it is a challenging series of hurdles over which even the most determined researcher can stumble. Research translation is a core focus within C-PAN. Dr Sharleen O'Reilly recently commenced her National Health and Medical Research Council Translating Research Into Practice (NHMRC TRIP) Fellowship to tackle this area head-on for women who have had gestational diabetes.

Over 20,000 Australian women are estimated to have a pregnancy with gestational diabetes annually and this number is rising, along with population obesity rates. One in two women who have had gestational diabetes go on to develop type 2 diabetes and their heart disease rate is also increased. Gestational diabetes is not all doom and gloom though. Clinical trials demonstrate type 2 diabetes being prevented in nearly 60% of people with lifestyle change and the effect continues 10 years after the trials finished. A clear gap between the evidence and practice is visible when the level of diabetes prevention care being delivered at general practice is examined, which is the target of Dr O'Reilly's TRIP work.

The TRIP Fellowship work - called the "GooD4Mum project" - is focused on: finding out the diabetes prevention care issues faced by mums who have had gestational diabetes and their GPs nationally; improving the diabetes prevention care a mum who has had gestational diabetes receives within 25 Victorian GP practices; and scaling up the improved care so more Australian mums receive better diabetes prevention support.

References

1 Kim C. Maternal outcomes and follow-up after gestational diabetes mellitus. *Diabetic Medicine* 2014; 31(3):292-301.
2. Lindström J, Ilanne-Parikka P, Peltonen M, Aunola S, Eriksson JG, Hemiö K, et al. Sustained reduction in the incidence of type 2 diabetes by lifestyle intervention: follow-up of the Finnish Diabetes Prevention Study. *The Lancet* 2006; 368(9548):1673-9.
3. Wilkinson SA, Lim SS, Upham S, Pennington A, O'Reilly SL, Asproloupos D, et al. Who's responsible for the care of women during and after a pregnancy affected by gestational diabetes? *Medical Journal of Australia* 2014; 201(3):S78-S81.

Key messages

1 in 2 mums who had diabetes in pregnancy (called gestational diabetes) will go on to develop type 2 diabetes but lifestyle changes can prevent this from happening.

The GooD4Mum project aims to pilot work with general practitioners and practices to improve the diabetes prevention care delivered to mums.

The findings of the GooD4Mum project will be scaled up within national diabetes prevention initiatives.

Funding acknowledgement
Dr Sharleen O'Reilly receives NHMRC TRIP Fellowship funding (No.1069254). The contents of this piece are solely the responsibility of the individual author and do not reflect the views of the NHMRC.

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TELEVISION VIEWING IMPACTS ON YOUNG CHILDREN'S PSYCHOSOCIAL AND COGNITIVE DEVELOPMENT

Children aged five years and under spend about two hours a day watching television, and more time using other electronic media such as digital tablets and computers. The marketing around much of the programing available for young children claims a myriad of educational and other benefits. And certainly parents report benefits such as being able to attend to other responsibilities while their children are engaged in television viewing. However, a small and growing body of evidence indicates that television viewing is detrimental to young children's health and development. Of particular concern, is the impact this behaviour may have on their psychosocial health and cognitive development, which influences later mental health and academic achievement.

Research into the impact of television viewing and young children's psychosocial health and cognitive development is an emerging field, with C-PAN researchers leading the field internationally. Children watching more television are more likely to exhibit aggressive behaviour and have poorer classroom engagement, along with decreased cognitive performance, such as lower levels of attention, language development and memory.

To support better outcomes for young children, Dr Trina Hinkley and C-PAN colleagues are working to understand the contexts in which these associations are evident. We are in the early stages of developing an objective method of monitoring viewing behaviours to better understand children's and families' viewing patterns. We are also developing programs to support lower levels of television viewing and improved psychosocial health and cognitive development during the critical early childhood period.

References

1. Leblanc AG, Spence JC, Carson V, Connor Gorber S, Dillman C, Janssen I, et al. Systematic review of sedentary behaviour and health indicators in the early years (aged 0-4 years). *Applied Physiology, Nutrition and Metabolism* 2012; 37(4): 753-72.
2. Hinkley T, Teychenne M, Downing KL, Ball K, Salmon J, Hesketh KD. Early childhood physical activity, sedentary behaviors and psychosocial well-being: a systematic review. *Preventive Medicine* 2014; 62: 182–192.

Key messages

Young children spend a large proportion of their time watching television.

Television viewing is detrimental to children's psychosocial health and cognitive development which impacts later mental health and academic achievement.

Funding acknowledgement
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RELATIONSHIPS BETWEEN A HEALTHY DIET AND COGNITIVE FUNCTION IN OLDER AUSTRALIANS

There are more than 332,000 Australians currently living with dementia and a new case is diagnosed every six minutes. As there is currently no cure, it is important to look for ways to slow down and reduce the risk of dementia before it starts to affect cognitive function and behaviour. The causes of dementia are complex and not fully understood but the condition is increasingly linked to potentially modifiable risk factors including diabetes, hypertension and obesity in midlife, smoking, depression and physical inactivity. Consumption of a healthy diet may also protect cognitive function and reduce the risk of dementia in older age, however large-scale studies of nutrition and cognitive function in the Australian population are rare.

This study led by Dr Catherine Milte and funded by the Medibank Health Research Fund, will investigate relationships between dietary intake and cognitive function among participants of the Wellbeing, Eating and Exercise for a Long Life (WELL) study, a longitudinal cohort study of 4082 people aged 55 years and over. We are currently assessing cognitive function in a subgroup of 700 WELL study participants and will relate this to dietary intake and health data collected in 2010, 2012 and 2014 as part of the larger study.

The study findings will inform public health strategies about how to protect cognitive function and support health in older age. It is expected that the number of people in Australia suffering from dementia will double in the next 20 years and through this research we hope to help reduce some of the burden for these people, their families and our health system in the future.

References

1. Barnes DE, Yaffe K. The projected effect of risk factor reduction on Alzheimer's disease prevalence. *Lancet Neurology* 2011; 10:819-28.
2. Parletta N, Milte CM, Meyer BJ. Nutritional modulation of cognitive function and mental health. *The Journal of Nutritional Biochemistry* 2013; 24:725-43.
3. McNaughton SA, Crawford D, Ball K, Salmon J. Understanding determinants of nutrition, physical activity and quality of life among older adults: the Wellbeing, Eating and Exercise for a Long Life (WELL) study. *Health and Quality of Life Outcomes* 2012; 10:109.

Key messages

Dementia affects one in ten people aged over 65 in Australia and the number of cases is expected to double in the next 20 years.

C-PAN's research will investigate relationships between a healthy diet and cognitive function in older people to inform future public health strategies and reduce dementia risk.

Funding acknowledgement
Medibank Health Research Fund, Australian Research Council and Diabetes Australia Research Trust.

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NEWS AND EVENTS

FUNDING SUCCESS

Congratulations to:

- Dr Catherine Milte awarded $48,514 from the Medibank Health Research Fund for her research project, *Understanding the importance of a healthy diet for preserving cognitive function of older Australians*.

- Professor Ester Cerin awarded an Australian Research Council Future Fellowship.

- Dr Rachel Laws awarded a National Health and Medical Research Council Early Career Fellowship.

Professor Ester Cerin

Dr Rachel Laws

SHOWCASING OUR RESEARCH

C-PAN staff and students have showcased their research at numerous events including:

- Professor Russell Keast provided invited plenaries at The Science of Taste Symposium, The Royal Danish Academy of Science and Letters, Copenhagen, and *The Weurman Flavour Symposium*, Cambridge University UK.

- Professor Rob Daly gave invited plenaries at the *American Society of Bone and Mineral Research, Nutrition Working Group* meeting in Houston, Texas and the *International Osteoporosis Federation 5th Asia-Pacific Osteoporosis Congress* in Taipei, and invited keynote presentations at the *Physical training and bone - from osteocyte to fracture* symposium, University of Gothenburg, Clinical Osteoporosis Research School, Sweden.

- A number of C-PAN staff presented at the *2014 Be Active and Sports Medicine Australia* conference and the Australian New Zealand Obesity Society conference.

- Dr Karen Lamb presented at the *Epidemiological Association World Congress of Epidemiology* in Anchorage, Alaska, and at a seminar organised by the Department of Statistical Science at the University of Idaho.

- Dr Karen Lamb and Dr Lukar Thornton presented at the *Australasian Epidemiological Association Annual Scientific Meeting* in Auckland.

- PhD students Brianna Larsen, Alex Wolkow, and Grace Vincent recently presented at the *Australasian Fire and Emergency Services Authorities Council* conference in Wellington, New Zealand.

VISITORS TO C-PAN

Dr Makii Muthalib (University of Montpellier), a leading expert in the use of functional near-infrared spectroscopy (fNIRS), a non-invasive technique that measures blood oxygenation in human tissues recently visited C-PAN. During his visit, Dr Muthalib provided demonstrations and training to staff, participated in several ongoing research projects investigating the effects of exercise on brain activity in healthy and stroke participants, and participated in planning for future research projects to investigate the use of exercise as an adjunctive treatment modality for Parkinson's disease and stroke.

Professor Margaret Morris (University of NSW), a world leader in the developmental origins of health and disease field, recently visited C-PAN to discuss collaborative research opportunities.

AWARDS

Congratulations to Professor Aaron Russell awarded the Deakin University Vice-Chancellor's Award for Excellence in Research Supervision – highly commended, and Dr Trina Hinkley awarded the Deakin University Vice-Chancellor's Early Career Researcher Award for Research Excellence.

C-PAN's Dr Nicky Ridgers and Dr Lukar Thornton are two of only 10 early career researchers nominated by the Australian Research Council (ARC) to participate in the Singapore National Research Foundation Global Young Scientists Summit (GYSS) to be held in Singapore, January 2015. The GYSS brings together bright, young researchers from across the world to discuss with eminent global scientists and peers how latest scientific advances can address global challenges.

Dr Nicky Ridgers

Dr Lukar Thornton

C-PAN's Professor Mark Lawrence recently received the following three awards for his food policy research:

- 2014 British Medical Association 'highly commended' award in the 'Health and Social Care' category for his book, *Food Fortification: The Evidence, Ethics, and Politics of Adding Nutrients to Food*, 2013 Oxford University Press.

- Honorary Fellow at the Centre for Food Policy, City University London. The award will support Mark's ongoing research collaboration with Professors Tim Lang and Martin Caraher at City University.

- Adjunct Professor, Curtin University. The award will support Mark's Chief Investigator role on the five-year WA Healthway's funded Curtin University project *Food Law, Policy and Communications to Improve Public Health*.

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Our mission

To conduct high quality, multidisciplinary nutrition and physical activity research to actively inform policy and practice to improve health, and build capacity in nutrition and physical activity research in Australia.