2017 Lifespan Research Day

Welcome message from the Lifespan Research Network co-leaders

On behalf of the Lifespan Research Network, we welcome you to the 2017 Lifespan Research Day. We especially welcome our keynote speakers Associate Professor Natasha Nassar, Professor Yun-Hee Jeon and Associate Professor Michael Skilton.

Lifespan Research Day is a highlight of our community’s calendar, providing an opportunity to learn about recent research achievements and current projects that showcase the Lifespan theme.

We will hear about projects that seek to increase understanding of significant life stage transitions and investigate determinants of trajectory effects from one developmental life stage to the next. Our speakers will discuss research that sheds light on under-researched life stages and disadvantaged populations, and we’ll learn about research findings that not only contribute to discipline knowledge but have the potential for important health impact when translated.

We will also present the 2017 Lifespan Collaboration Award. Our finalists are on our program today as oral presentations of original work. The Lifespan Collaboration award recognises outstanding multidisciplinary, cross-faculty and/or international collaboration in lifespan research. We hope that you enjoy the program, meet new people with similar professional interests, and leave with some bright ideas for future collaborations.

Professor Richard Lindley and Professor Kate Steinbeck
Co-leaders, Lifespan Research Network

About the Lifespan Research Network

The Lifespan Research Network is a diverse community of researchers from the University of Sydney who are devoted to the study of human health and development across the stages of life.

Since it began in 2014, the Network has grown to include members from across the University’s schools and faculties, and many of the affiliated centres and institutes. The 2017 Research Day program reflects the diversity of the Lifespan community, and highlights the broad reach and relevance of the Lifespan theme within health and medical disciplines and beyond.

In 2017, the Lifespan Research Network is presenting an expanded program of events, awards and funding opportunities, including the 2017 Lifespan Collaboration Award which will be presented at the end of this meeting.

Membership of the Network is free and open to all clinical and health services and basic science researchers from The University of Sydney and affiliated centres and institutes.

For further information, please contact the Lifespan Research Network Office

Phone: +61 2 9351 1915
Email: sms.lifespan@sydney.edu.au
sydney.edu.au/lifespan-research-network
# Program
## 2017 Lifespan Research Day

**Wednesday 26 July 2017**  
New Law School Lecture Theatre 106

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<td>9.40am</td>
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| 9.45am| Session 1 – Transitions and trajectories | K01 A/Prof Natasha Nassar, Menzies Centre for Health Policy, Sydney School of Public Health, The University of Sydney  
Born a bit early: the impact on childhood health and development through the early years |         |                         |
| 9.45am| Session 1 – Transitions and trajectories | P01 Dr Marnee McKay, Faculty of Health Sciences, The University of Sydney  
1000 Norms Project: Reference values for functional outcome measures across the lifespan |         |                         |
| 10.20am| Session 1 – Transitions and trajectories | P02 Ms Tessa Copp, Wiser Healthcare, Sydney School of Public Health, The University of Sydney  
Are expanding disease definitions unnecessarily labelling women with a lifelong label of polycystic ovary syndrome (PCOS)? |         |                         |
| 10.35am| Session 1 – Transitions and trajectories | P03 A/Prof Simon Poon, School of Information Technologies, Faculty of Engineering and Information Technologies, The University of Sydney  
Socialising health burden through different network topologies: A simulation study |         |                         |
| 11.10am|         | Morning tea                                                           |         |                         |
| 11.40am| Session 2 – Translation | K02 Prof Yun-Hee Jeon, Sydney Nursing School, The University of Sydney  
Optimising independence and social health of people living with dementia – Power of reablement approaches to care and implementation processes |         |                         |
| 11.40am| Session 2 – Translation | P04 Dr Pegah Varamini, Faculty of Pharmacy, The University of Sydney  
Novel LHRH-functionalised cylindrical polymer brushes for targeted therapy of breast cancer |         |                         |
| 12.35am|         | P05 Dr Hoi Lun (Helen) Cheng, Academic Department of Adolescent Medicine, The Children’s Hospital at Westmead, The University of Sydney  
Pubertal change in appetite hormones over three years: relationships with the growth spurt and obesity |         |                         |
| 12.50am|         | I01 Prof Richard Lindley, Westmead Clinical School, The University of Sydney  
The ATTEND Trial: Lifespan lessons from India |         |                         |
| 1.05pm|         | Lunch                                                                |         |                         |
| 2.05pm| Session 3 – Life stages | K03 A/Prof Michael Skilton, Boden Institute of Obesity, Nutrition, Exercise & Eating Disorders, Sydney Medical School, The University of Sydney  
Optimising independence and social health of people living with dementia – Power of reablement approaches to care and implementation processes |         |                         |
| 2.10pm| Session 3 – Life stages | P04 Dr Cynthia Forlini, Sydney Health Ethics, School of Public Health, The University of Sydney  
Are older Australians following recommendations for healthy cognitive ageing? Evidence from the 1921-26 cohort of the Australian Longitudinal Study on Women's Health |         |                         |
| 2.45pm| Session 3 – Life stages | P07 Dr Pegah Varamini, Faculty of Pharmacy, The University of Sydney  
Novel LHRH-functionalised cylindrical polymer brushes for targeted therapy of breast cancer |         |                         |
| 3.00pm| Session 3 – Life stages | P08 Dr Rahena Akhter, Faculty of Dentistry, The University of Sydney  
Factors influencing dental caries experience among children and adolescents with cerebral palsy in a low-resource setting |         |                         |
| 3.15pm| Session 3 – Life stages | P09 Dr Helen McGuire, Centenary Institute and Central Clinical School, The University of Sydney  
Using comprehensive mass cytometric immunophenotyping to explore immune imbalance underlying endometriosis |         |                         |
| 3.30pm|         | Afternoon tea and networking                                          |         |                         |
| 4.10pm|         | Presentation – 2017 Lifespan Collaboration Award  
Closing remarks  
Prof Kate Steinbeck, Lifespan Research Network co-leader |         |                         |
| 4.30pm|         | Close                                                                |         |                         |
Invited speakers

Associate Professor Natasha Nassar

Associate Professor Natasha Nassar is a perinatal and paediatric epidemiologist and NHMRC Career Development Fellow (Level 2). She leads the MenziesKids team at the Menzies Centre for Health Policy, University of Sydney. She has almost 15 years’ experience in public health, health services and health policy research. She has had ongoing NHMRC salary support since 2003 and was awarded her PhD in 2006 and then undertook a postdoctoral fellowship at the Telethon Kids Institute in Perth, Western Australia and then returned to Sydney in 2009 where she was based at the Kolling Institute until 2015.

Natasha’s research applies a population health and lifecourse approach and focuses on investigating the role of early life events, including maternal health, exposures in pregnancy and fetal and newborn health and their impact on subsequent child health, injury, development and paediatric healthcare utilisation. This has involved a broad range of research from genetic and pregnancy biomarker studies through to clinical surveys and randomised trials and population health, health service and health policy research. She has particular expertise in leading data linkage studies involving the use of linked administrative birth, congenital anomaly, hospital discharge and deaths data; as well as the application of novel linkage and analysis of pathology, newborn screening, child protection, early development and NAPLAN education data. She is currently the International Representative on the Executive Committee for the Society of Paediatric and Perinatal Epidemiologic Research and on the Editorial Board of the journal, Paediatric and Perinatal Epidemiology.

Professor Yun-Hee Jeon

Professor Yun-Hee Jeon is the Susan and Isaac Wakil Professor of Healthy Ageing at Sydney Nursing School. Yun-Hee is a registered nurse, academic and leading researcher in psychogeriatrics and gerontology. Her research focuses on developing innovative and creative approaches to improving the health and wellbeing of older people with dementia and other chronic illnesses. She has successfully led and completed over 35 multiple small to large scale trials and projects, and has methodological expertise in action research, qualitative research and mixed methods. She also has expertise in industry partnership projects, behavioural intervention trials, and systematic reviews. Currently, she leads a number of projects concerning end of life care, shared decision making and reablement and person-centred approaches to care for older persons with dementia; measuring quality in aged care, and aged care workforce issues.

Associate Professor Michael Skilton

Michael Skilton is a vascular physiologist by training, and currently Associate Professor and National Heart Foundation Future Leader Fellow at the Boden Institute of Obesity, Nutrition, Exercise and Eating Disorders at the University of Sydney.

He graduated from the University of Queensland (Bsc Hons II) in 1998, and was awarded a PhD from the University of Sydney (2005) for his thesis on “Nutrition and cardiovascular structure and function”.


He has been a Chief Investigator on research grants totalling over $6m, including the Small Baby Omega-3 (SO3) trial. He has recently established the Nutrition and CVD project node at the Charles Perkins Centre, and leads the Nutrition and Cardiometabolic Health group at the Boden Institute.

His main research interests lie at the intersection between nutrition and cardiometabolic diseases across the lifespan, early origins of disease, non-invasive assessment of vascular health, and Aboriginal and Torres Strait Islander health.

Professor Richard Lindley

Richard Lindley is Professor of Geriatric Medicine, Westmead Clinical School, and co-chair of the Lifespan Research Network. His main research interests include evaluating new treatments for older people and he has published on a wide variety of subjects ranging from stroke to babies.

He recently led an international collaborative group that evaluated family-led rehabilitation after stroke in India (the ATTEND Trial), published in the Lancet in June 2017.
Abstracts

K01 Lifespan oral health

Natasha Nassar
Menzies Centre for Health Policy, Sydney School of Public Health, The University of Sydney

Changes in obstetric clinical practice over the last 20 years have seen a significant increase in planned birth (labour induction or prelabour caesarean section) before 40 weeks gestation. This is despite evidence that babies born slightly early at 37-38 weeks are more likely to have adverse outcomes in the newborn period. However, there was very little information about the outcomes of early planned birth on early child health and development. This presentation will highlight results from a recent program of research using linked population-health data to explore the health and development trajectories of infants born a bit early.

P01 1000 Norms Project: Reference values for functional outcome measures across the lifespan

Marnee J McKay1, Jennifer N Baldwin1,2, Milena Simic1, Natalie Vanicek1, Paulo Ferreira1, Joshua Burns1,4
for the 1000 Norms Project Consortium

1Faculty of Health Sciences, The University of Sydney
2School of Clinical Sciences, Faculty of Health and Environmental Sciences, Auckland University of Technology
3School of Life Sciences, University of Hull
4Sydney Children’s Hospitals Network (Randwick and Westmead) and Paediatric Gait Analysis Service of New South Wales, Children’s Hospital at Westmead

Background: Progress in clinical research to improve the understanding of the determinants of healthy ageing depends on the ability to accurately track and identify age-related functional decline. Knowledge of what is considered normal is essential to accurately identify and evaluate presentations that are abnormal. The aim of this study was to generate reference values for commonly performed functional outcome measures in 1000 children and adults, and to investigate the influence of demographic, anthropometric, strength and flexibility characteristics.

Methods: Twelve functional outcome measures were collected from 1000 healthy individuals aged 3-101 years: six-minute walk test, 30-second chair stand test, timed stairs test, long jump, vertical jump, choice stepping reaction time, balance (star excursion balance test, tandem stance eyes open and closed, single-leg stance eyes closed) and dexterity (9-hole peg test, functional dexterity test). Correlation and multiple regression analyses were performed to identify anthropometric, isometric muscle strength, and joint flexibility factors independently associated with each measure.

Results: Age- and sex-stratified reference values for functional outcome measures were generated. Functional performance increased through childhood and adolescence, plateaued during adulthood, and declined in older adulthood. While balance did not differ between the sexes, male participants generally performed better at gross motor tasks while female participants performed better at dexterous tasks. Height was the most consistent correlate of functional performance in children, while lower limb muscle strength was a major determinant in adolescents and adults. In older adults, age, lower limb strength, and joint flexibility explained up to 63% of the variance in functional measures.

Conclusion: The normative reference values generated from this study provide a framework to accurately identify and track age-related functional decline. These data may also assist in the diagnosis of musculoskeletal and neuromuscular disorders and contribute to the development and validation of responsive outcome measures for disease-modifying therapeutic trials.

P02 Are expanding disease definitions unnecessarily labelling women with a lifelong label of polycystic ovary syndrome (PCOS)?

Tessa Copp1, Jesse Jansen1, Jenny Doust1, Ben Mo1, Anuja Dokras2, Kirsten McCaffery1

1Wiser Healthcare, Sydney School of Public Health, University of Sydney
2Centre for Research in Evidence-Based Practice, Bond University
3Robinson Research Institute, School of Paediatrics and Reproductive Health, University of Adelaide
4Penn PCOS Centre, Department of Obstetrics and Gynaecology, University of Pennsylvania, USA

Background: Polycystic ovary syndrome (PCOS) is the most commonly diagnosed endocrine disorder affecting reproductive-aged women, and is associated with adverse reproductive, metabolic, cardiovascular and psychosocial outcomes. PCOS is considered a lifelong condition, and widening diagnostic criteria has introduced various PCOS phenotypes and increased PCOS prevalence from 4-6.6% up to 21%, raising concerns about overdiagnosis and unnecessary disease labelling. Aims: This presentation will examine the evidence and uncertainty surrounding PCOS diagnosis, overdiagnosis and treatment benefit, and the psychosocial impact of a diagnosis. We conducted a narrative review of the relevant literature to identify the uncertainties in the diagnosis and management of PCOS, and investigate the risks and harms of expanded disease definitions and unnecessary disease labelling for adolescents and reproductive aged women.

Results: Four areas of potential overdiagnosis are identified: Diagnoses have rapidly increased without evidence of benefit, the symptoms included in the diagnostic criteria overlap with signs of normal development in adolescents and young women, the non-hyperandrogenic phenotypes of PCOS (e.g. polycystic ovaries and anovulation) do not have the same associated adverse long-term implications as the hyperandrogenic phenotypes (e.g. hyperandrogenism and anovulation), and PCOS may be a transitory rather than a lifelong condition for a high proportion of women diagnosed using current criteria, with symptoms resolving over time.

Conclusion: The benefits of a diagnosis may include explanation and validation of symptoms, and motivation to make lifestyle and other changes to reduce the sequelae of the disease. However, labelling healthy women with PCOS unnecessarily may negatively impact their psychological wellbeing, inducing fear and anxiety about future fertility and long-term health. A slower, stepped care or delayed approach to diagnosis could be a way forward to optimise benefits and reduce harm from disease labelling.
PO3 Socialising health burden through different network topologies: A simulation study
Simon Poou1, Adrian Peacock1, Peter Kim1, Mark Latt1
1 School of Information Technologies, Faculty of Engineering and Information Technologies, The University of Sydney
2 School of Mathematics and Statistics, Faculty of Science, The University of Sydney
3 Sydney Medical School, The University of Sydney

Background: An ageing population and the expectation of premium quality health services combined with the increasing economic burden of the healthcare system requires a paradigm shift toward patient oriented healthcare. The guardian angel theory described by Szolovits [1] explores the notion of enlisting patients as primary providers of information and motivation to patients with similar clinical history through social connections.

Aims: An agent based model was developed to simulate and explore how individuals are affected through their levels of intrinsic positivity based on the concept of “emotional contagion” introduced by Christakis and Fowler [2].

Design: eGuardian Angel is an agent based model of a social innovation for individuals with chronic disease, modelled on assisting them in keeping motivated to reach their individual health goals. The simulation consists of two primary agents: guardians and children. Guardians provide support to their child through motivational messages, support, advice, and personal experience through aspects including achieving goals, diet, exercise, and psychological health [3]. The role of the child is to provide feedback to their guardian if they were positively affected by the message sent to them. Each user can be both a guardian and a child, or either, depending on the network topology being employed.

Results: Ring, point-to-point (paired buddy), and random networks were modelled, with individuals able to send messages to each other given their levels of variables positivity and motivation. By looking at the 3 network topologies when simulated in a social health context it is clear that all may provide benefit to the user. Of the 3 modelled networks it is apparent that the ring network provides the most equal, collective improvement in positivity and motivation for all users. Further study into other network topologies should be undertaken in the future.

KO2 Optimising independence and social health of people living with dementia – Power of reablement approaches to care and implementation processes
Yun-Hee Jeon
Sydney Nursing School, The University of Sydney

Psychological, neurological, and social impairments caused by dementia may limit the person’s everyday living and experiences, but s/he still retains the capacity to enjoy a meaningful life. The notion of ‘social health’ is critical in understanding the person’s experience with dementia as it values the importance to them of being able to maximise their potential for fulfilment through achieving a balance between opportunities and limitations (Huber et al. 2011; Vernooij-Dassen & Jeon 2016).

Increasingly, research has shown the importance of reablement approaches to care, maximising the health and wellbeing of older people through engagement in their daily, physical, social and community activities. When care and support are underpinned by reablement, providers and practitioners collaborate and encourage the person to learn, restore and regain their functional and psychosocial capacity and independence as best as they are able. Based on her previous and current research on dementia care, Professor Jeon will discuss key contributions that person centered and reablement approaches to care make to optimising the social health of people living with dementia and family caregivers, as well as challenges associated with the implementation of these care approaches.

PO4 Novel LHRH-functionised cylindrical polymer brushes for targeted therapy of breast cancer
Pegah Varamini1, Markus Mueller1, Robert Baxter2
1 Faculty of Pharmacy, The University of Sydney
2 School of Chemistry, The University of Sydney
3 Kolling Institute of Medical Research

Breast cancer is the most common malignancy and the second leading cause of cancer-related death among Australian women despite existing progress in the development of novel therapeutic strategies. Triple-negative breast cancer (TNBC) accounting for 10-17% of all breast carcinomas, is an aggressive histological subtype. It represents an important clinical challenge because these cancers do not respond to the available targeted agents. Thus, there is an urgent demand for specific therapies that target other receptors that are overexpressed in TNBCs.

We have designed and synthesised a novel drug delivery system, which targets breast cancer cells through a ligand of luteinizing hormone-releasing hormone (LHRH) receptors. LHRH receptors are overexpressed in breast cancer cells including MBC and TNBC cells while they are not expressed detectably in most visceral organs. We have taken advantage of this differential receptor expression by attaching a new derivative of the LHRH peptide (as a targeting moiety) to the outer surface of novel polymer nanoparticles based on the cylindrical polymer brushes (CPBs). LHRH-modified CPBs (LHRH-CPBs) were synthesised, tagged with a fluorescent compound (Alexa Fluor 647) and characterised. During the preliminary biological studies, we investigated the uptake of the particles by a TNBC LHRH-receptor positive cell line, MDA-MB-231, using Confocal Laser Scanning Microscopy (CLSM). Furthermore, the LHRH-receptor mediated uptake was examined by a triptorelin competitive study. The cellular uptake of LHRH-CPBs by MDA-MB-231 cells was examined in the presence and absence of competitor triptorelin (high-binding affinity ligand of the LHRH receptors, 100 µM) by confocal microscopy.

In the absence of triptorelin, uptake of LHRH-CPBs was seen in the form of highly fluorescent punctate bodies in the cytoplasm of LHRH-receptor positive MDA-MB-231 cells. In the presence of triptorelin minimal uptake was observed in these cells suggesting the LHRH-receptor mediated uptake of the modified particles. The toxicity of the unloaded nanoparticles was also evaluated against three different breast cancer cell lines (MDA-MB-231, MCF-7 and SKBR) using MTS antiproliferative assay. LHRH-CPBs did not significantly affect the viability of any of the cell lines following 48 h incubation (reduction between 8-12% relative to the negative control, p > 0.05). This slight reduction could be explained by the direct antiproliferative activity of the LHRH derivative attached to CPBs.

In conclusion, we have designed and synthesised a novel targeted delivery system with selective uptake through overexpressed receptors on a LHRH-receptor positive TNBC cell line. This is a promising career to selectively deliver antineoplastic agents to the breast cancer cell.
P05 Pubertal change in appetite hormones over three years: relationships with the growth spurt and obesity

Hoi Lun Cheng1,2, Amanda Sainsbury3, Karen Paxton1, Catherine Hawke1, Georgina Luscombe1, Katherine Steinbeck1

1Academic Department of Adolescent Medicine, The Children’s Hospital at Westmead, The University of Sydney
2Discipline of Child and Adolescent Health, Sydney Medical School, The University of Sydney
3School of Rural Health, The University of Sydney

Background: Pubertal adolescents have strong appetites. Presumably, this is due to change in key appetite hormones e.g. ghrelin and PYY, although little data exist to support this.

Aim: To measure ghrelin and PYY change in pubertal adolescents and relate these to growth and obesity.

Methods: This study included a community sample of 37 adolescents (70% boys) from the ARCHER study. Anthropometric and body composition data were collected annually over three years, along with blood for analysis of ghrelin, PYY and leptin. Generalised additive mixed models guided selection of appropriate growth curves. Linear and quadratic mixed models assessed direction and significance of predictors. Ghrelin and PYY profiles were compared based on overweight/obesity (O&O) status.

Results: Baseline age was 11.2±0.9y (mean±SD) and O&O prevalence was 22%. Peak growth velocity was at 12y in girls and 14y in boys. Body composition and leptin changes followed normal sex-specific trends. Ghrelin exhibited a U-shape change nadiring at peak growth, and this was clearer in boys than girls. Greater height (p=0.03) and weight (p=0.001) predicted lower ghrelin in girls, and the same was seen for weight in boys (p=0.02). PYY showed a linear decline across time, with higher levels predicted by higher leptin (p=0.08) in girls and greater waist circumference in boys (p=0.02). Analysis by weight status showed similar PYY change in O&O adolescents, but absence of the U-shaped trend for ghrelin.

Summary/conclusion: This is the first longitudinal study to show a nadir in ghrelin and drop in PYY during peak pubertal growth. The decline in PYY is consistent with its effects to induce satiety and the appetite increases typical at this age. The decrease in ghrelin at peak growth contradicts the hormone’s known orexigenic actions, suggesting other drivers of a strong appetite in puberty. Differential ghrelin profiles in O&O may reflect underlying metabolic/appetite regulatory dysfunction.

101 The ATTEND Trial: Lifespan lessons from India

Richard Lindley
Westmead Clinical School, The University of Sydney

Most stroke occurs in low- and middle-income countries, where organised stroke services are generally unavailable. These countries, however, have abundant “human” capital. The ATTEND Trial was a prospective randomised controlled trial with blinded endpoint that evaluated task shifting stroke rehabilitation to a nominated family caregiver across 14 sites in India. Patients with available caregivers were randomised in hospital, within a month of stroke onset, to receive usual care or an intervention of patient and caregiver training. Training occurred for one hour a day during the hospital stay, with up to 6 home visits after discharge. The intervention was mapped to the best rehabilitation evidence and culturally appropriate, supported by a written manual with ample illustrations in the patient’s own language. The primary outcome was death or disability measured at 6 months, and the sample size was 1,200. The Australian NHMRC funded the trial. The trial was prospectively registered, with publication of the protocol and statistical analysis plan prior to unblinding.

The results were published in the Lancet on 27th June 2017, and demonstrated no benefit on the primary outcome, nor on any of the secondary outcomes. The primary results suggested an interaction by sex in response to the intervention. However, further analysis has found that the sex of the patient influenced the sex of the caregiver and whether the caregiver was from the same or older generation, or of a younger generation. ATTEND is the first large-scale rehabilitation trial based in a low- or middle-income country and has shown no benefit for task shifting a complex intervention. The WHO encourage task shifting healthcare as a means of providing affordable healthcare. The ATTEND trial has illustrated the challenges of task shifting a complex intervention such as rehabilitation and also illustrates the complexity underlying some subgroup analyses.

K03 Nutrition and cardiometabolic disease: tailored interventions for life-stage specific risk

Michael Skilton
Boden Institute of Obesity, Nutrition, Exercise & Eating Disorders, Sydney Medical School, The University of Sydney

Cardiometabolic diseases, including heart disease, obesity and diabetes, are the leading cause of premature morbidity and mortality in Australia. An extensive body of epidemiologic and experimental data links various aspects of an adverse intrauterine environment with a higher risk of heart disease and diabetes disease in adulthood. Nonetheless, there is currently limited evidence for clinically- proven strategies to improve cardiometabolic health in people exposed to early life risk factors. The identification of novel early life risk factors and the assessment of early life intervention strategies are difficult given the long time differential between exposure and clinical outcome.

Age-appropriate techniques have been developed that provide relevant and useful information concerning the pathophysiological changes to the cardiovascular system that are mechanistically linked with later clinical disease. There is growing body of evidence describing the use of these techniques in the study of early life risk factors, and the development and assessment of putative prevention strategies. Such evidence has the potential to identify the ideal early life environment, and the strategies most likely to have a meaningful impact on outcomes in adulthood in those at highest risk.

P07 Are older Australians following recommendations for healthy cognitive ageing? Evidence from the 1921-26 cohort of the Australian Longitudinal Study on Women’s Health

Cynthia Fortoli1, Valerie Carter1, Jayne Lucke1

1Sydney Health Ethics, School of Public Health, The University of Sydney
2Brain and Mind Centre and Sydney Health Ethics, The University of Sydney
3Australian Research Centre in Sex, Health & Society, La Trobe University

Background: Current public health messages are emphasizing the importance of healthy cognitive ageing (HCA) for the ageing population. In addition to addressing the potential increase in the incidence of dementia, HCA can keep older individuals active and productive in their communities for longer.

Methods: 332 women responded to the free-text question of all six waves of the survey. The content of these responses was coded qualitatively and thematically to identify (1) the strategies that the women have used to care for their cognitive health as they age and (2) any barriers to HCA that they may have experienced.

Aim: In this study, we analyse free-text survey responses from the oldest cohort (born 1921-26) of the Australian Longitudinal Study on Women’s Health (ALSWH) to begin exploring whether and how older Australians are following recommendations for HCA.

Evidence from the 1921-26 cohort of the Australian Longitudinal Study on Women’s Health...
Results: The majority of ALSWH women integrated some of the recommendations for HCA into their lifestyle though few reported doing so purposefully. Many of the women reported lifelong engagement in recommended activities whilst others were prompted to take them up later in life following the advice of healthcare professionals. The women reported both physical and social barriers to not only following but also sustaining the recommended behaviours. However, they also specified ways in which they felt empowered to be physically, mentally and socially active.

Conclusion: The results of this study are a first step in helping policymakers and community leaders understand the context of ageing Australians, which will in turn foster policy that is cognizant of the needs, potential limitations and resilience of the ageing population.

P08 Factors influencing dental caries experience among children and adolescents with cerebral palsy in a low-resource setting

Rahena Akhter¹, Nur Mohammad Monsur Hassan¹, F Elizabeth Martin¹, Mohammad Muhit²,³, Razilur Rahman⁴, Hayley Smithers–Sheedy⁵, Cheryl Jones⁶,⁷, Nadia Badawi⁵,⁷, Gulam Khandaker⁴,⁶,⁷
¹Faculty of Dentistry, The University of Sydney
²School of Dentistry and Health Sciences, Charles Sturt University
³CSF Global, Bangladesh
⁴Asian Institute of Disability and Development, University of South Asia, Bangladesh
⁵Cerebral Palsy Alliance Research Institute, The University of Sydney
⁶The Children’s Hospital at Westmead Clinical School, The University of Sydney
⁷Marie Bashir Institute of Emerging Infection and Biosecurity, The University of Sydney

Background and aim: Cerebral palsy (CP) is a set of nonprogressive neuro muscular disorders caused by defects in the developing fetal brain. Our aim was to describe the oral health status and investigate factors affecting dental caries experience among children with cerebral palsy (CP) in rural Bangladesh.

Methods: A cross-sectional study was conducted among children with CP who are part of the Bangladesh Cerebral Palsy Register (BCPR) study.

Caries experience was measured by identifying decayed, missing, and filled teeth for deciduous and permanent teeth (dmft/DMFT). Clinical periodontal index, body mass index, oral hygiene behaviour, dental visit pattern, masticatory ability, and dietary habits were recorded. CP motor types and severity of functional mobility (Gross Motor Function Classification System [GMFCS]) were assessed. The data were processed using SPSS version 22.0 for windows. Binary logistic regression analysis was used and adjusted by age and sex. Odds ratios (ORs) and 95% confidence intervals (CI) were calculated from the model. The significance level was set at p<0.05.

Results: Of 90 children with CP (mean age 9y 7mo, range 2–17y, 37.8% female and 62.2% male), 35% of 2 to 6 year olds, and 70% of 7 to 11 year olds (p=0.014) experienced caries (dmft + DMFT>0). The mean values (standard deviation [SD]) of dmft and DMFT were 2.46 (3.79) and 0.72 (1.79) respectively. After adjusting for age and sex, binary logistic regression analysis showed a significant relationship with dental caries for children who had quadriplegia (odds ratio [OR] 5.56, p=0.035), tooth cleaning less than one time/day (OR 0.08, p=0.016), using toothpowder or charcoal for cleaning (OR 7.63, p=0.015), and snacking between meals more than one time/day (OR 0.08, p=0.016). The adjusted odds ratio for decayed teeth (dmft) was significantly greater for children with quadriplegia (OR 6.93, p=0.016).

Conclusion: Early oral health preventive care is required for children with CP because dental caries is highly prevalent in these children and also requires a comprehensive multidisciplinary approach by both medical and dental healthcare professionals.

P09 Using comprehensive mass cytometric immunophenotyping to explore immune imbalance underlying endometriosis

Helen McGuire¹,², Kabilan Mahesan¹,², Barbara Fazekas de St. Groth¹,³, Alison Hey-Cunningham⁴
¹Centenary Institute and Central Clinical School, The University of Sydney
²Department of Pathology, Sydney Medical School, The University of Sydney
³Ramaciotti Facility for Human Systems Biology, Charles Perkins Centre, The University of Sydney
⁴Department of Obstetrics, Gynaecology and Neonatology, Sydney Medical School, The University of Sydney

Background: Endometriosis is a disease affecting 10–15% of women that results in reduced fertility and debilitating pain. Immune mechanisms in endometriosis-associated infertility have not yet been investigated; moreover our current understanding of the adaptive immune response in endometriosis is limited.

Aims: This study set out to comprehensively immunophenotype patients with endometriosis, both systemically (peripheral blood) and locally (endometrial tissue), investigating abnormalities in immune populations and links to infertility in patients.

Methods: Blood and endometrium samples from 17 clinically documented endometriosis patients, as well as blood samples from 15 age/gender matched healthy individuals were assessed with a 37 marker panel to identify canonical immune subsets. Cryopreserved enzymatically-dissociated endometrium tissue and peripheral blood mononuclear cells were defrosted and stained with metal-labelled antibodies and markers for DNA content and viability. Samples were acquired on the Helios upgraded CyTOF2 mass cytometer. Following normalisation of files, viable cells were manually gated to more than 80 populations and cell subsets enumerated.

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Aims: This study set out to comprehensively immunophenotype patients with endometriosis, both systemically (peripheral blood) and locally (endometrium tissue), investigating abnormalities in immune populations and links to infertility in patients.

Methods: Blood and endometrium samples from 17 clinically documented endometriosis patients, as well as blood samples from 15 age/gender matched healthy individuals were assessed with a 37 marker panel to identify canonical immune subsets. Cryopreserved enzymatically-dissociated endometrium tissue and peripheral blood mononuclear cells were defrosted and stained with metal-labelled antibodies and markers for DNA content and viability. Samples were acquired on the Helios upgraded CyTOF2 mass cytometer. Following normalisation of files, viable cells were manually gated to more than 80 populations and cell subsets enumerated.

Results: Performing a series of Significance of Microarray Analysis revealed distinct immune signatures identifying differences in endometriosis patients compared to controls in peripheral blood, as well as patient specific trends in tissue and blood that linked with stages of disease and fertility status. Importantly, correlative analysis between blood and tissue suggest local tissue effects can be reflected in global immune dysfunction.

Conclusions: Findings from this study supported and extended beyond our recent work indicating a locally disturbed numbers of dendritic cells (DC) and regulatory T cells (Treg) in endometriosis. Treg and DC regulate maternal immune tolerance to implantation and continuing pregnancy, and maternal dysregulation of these cells is associated with infertility. Our results support the hypothesis that fertility status may be linked with immune dysfunction. Further, our study supports the potential for a non-invasive blood test for diagnosis of endometriosis.