Joint Centre for Ageing, Cognition, and Wellbeing (CACW) and BioNet Conference

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Tuesday 30 November
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Overview

The CACW centre’s of multidisciplinary researchers and the BioNet Group focused on clinical practice and translation are joining together to present this year’s conference themes of Dementia Risk Reduction and Social and Emotional Wellbeing of Older Adults.

The Centre for Ageing, Cognition, and Wellbeing at Macquarie University is a collaborative group of multidisciplinary researchers with interest in the normal and abnormal aspects of ageing. This includes research related to understanding and improving wellbeing related to neurodegenerative diseases, mental disorders, and health related conditions in the community and residential aged care. In addition, we are interested in understanding the normal impacts of ageing on cognition, reading, emotion regulation, social connections and workforce participation (retirement). We are also interested in studying how cognitive support systems (e.g. engaging in skilled activities with others) may benefit older adults. We have close connections with researchers across Macquarie University and collaborate broadly with psychology, cognitive science, medicine, audiology, physiotherapy and business, to name a few.

We use a wide range of research methods including clinical trials, psychometric methods, neuropsychological testing, eye movement analysis, psychophysiological measurement, questionnaire and survey research, interview and focus group research methods.

BioNetwork’s mission is to expand the links between research and clinical medicine specialties, with a special interest in Macquarie University’s health priorities. In line with this mission it is well-timed to be during the decade 2020-2030 identified as the ‘decade of healthy aging’. This year, BioNetwork 2021’s aim is to provide opportunities for sharing knowledge in the Aging research field and promote research programs with strong relevance to practice and to age gracefully, while ensuring the wellbeing of individuals. BioNetwork 2021 welcomes collaboration with Macquarie University’s Centre of Aging, Cognition and Wellbeing to leverage the importance of this year’s theme of biological aging and wellbeing. We aim to further stimulate interaction and strengthen existing long-term collaboration between different departments at Macquarie University and identify novel national and international prospects for collaboration.
Conference Organising Committee
Professor Viviana Wuthrich
A/Prof Piers Dawes
Dr Paul Strutt
HDR Heidi Hillebrandt
HDR Gabi Picard
Dr Nino Kordzakhia

Themes

Dementia Risk Reduction

Social and Emotional Wellbeing of Older Adults
Keynote Speaker Biographies

**Professor Ralph Martins**

Professor of Neurobiology in the department of Department of Biomedical Sciences at Macquarie University, Foundation Chair of Aging and Alzheimer's disease at Edith Cowan University. Professor Martins has dedicated the last 34 years to Alzheimer’s disease (AD) research and is highly regarded as a world leader in the field. His insight into this devastating disease has led to a number of groundbreaking discoveries including being part of Professor Colin Masters lab where the seminal discovery of beta-amyloid and its precursor, the amyloid precursor protein (APP) was found in the brains of Alzheimer’s patients which is now universally acknowledged as being fundamental to the molecular pathology of Alzheimer’s disease. He identified oxidative stress in the Alzheimer brain which has been described as one of the landmark research discoveries in the history of the disease. Targeting beta amyloid and oxidative stress is now the central focus of clinical research into prevention and treatment, and a key target of the global pharmaceutical industry. Professor Martins and his team have been at the forefront globally in developing non-invasive and cost-effective early diagnostics for pre-clinical AD. They have progressed a cutting-edge program of biomarker candidates for AD-screening encompassing retinal amyloid imaging, proteomic analysis of blood and cerebrospinal fluid, lipidomics and genomics. They are also progressing a highly innovative program of therapeutic strategies and preventative interventions in preclinical AD. CI Martins has published over 370 peer-reviewed publications and his publications have been cited over 17677 times.

**Professor Sunil Bhar**

Professor of Psychology, PhD, University of Melbourne, Australia; Master of Arts (Clinical Psychology), University of Melbourne, Australia; Bachelor of Arts (Honours), University of Melbourne, Australia. Sunil Bhar is the director of the Wellbeing Clinic for Older Adults – Swinburne University’s mental health counselling clinic for older people living in residential aged care homes. He leads an active research lab focusing on the emotional wellbeing of older adults. His research focusses on the application of reminiscence and cognitive-behavioural therapies for older people living with depression, anxiety or dementia. He has won over $2 million in research grants to examine the wellbeing of older adults living in residential aged care settings. He is a diplomate of the Academy of Cognitive Therapies, having worked with Aaron Beck, MD for a number of years to investigate the adaptation of cognitive-behavioural therapy for older adults. Alongside his research and teaching interests, Professor Bhar has maintained a clinical practice for over 20 years.
1  
**Prevention of Cognitive Decline: the AUstralian-multidomain Approach to Reduce dementia Risk by prOtecting brain health With lifestyle intervention (AU-ARROW) study**

Prof Ralph Martins, Department of Neurobiology, Macquarie University

Martins RN1,2.
1Macquarie University, NSW, Australia
2Edith Cowan University, WA, Australia

Alzheimer's disease (AD) neuropathology develops for over 20 years before the widespread damage to the brain manifests as cognitive impairment. Genetic and epidemiological studies have led to the understanding that AD risk factors include insulin resistance, diabetes type 2, cardiovascular disease, hypertension, disrupted lipid metabolism, reduced cognitive and social activity, depression, as well as certain genetic polymorphisms which are linked to one or more of these factors. This has led to lifestyle studies which aim to reduce the level or impact of such AD risk factors. Early studies investigated individual lifestyle factors such as physical activity, diet, and cognitive stimulation, with encouraging though modest results. Multidomain interventional studies have ensued, and these have produced more convincing proof of the potential of lifestyle changes in modifying AD risk. One outstanding example of such studies is the Finnish Geriatric Intervention Study (FINGER) which reported that a multidomain lifestyle intervention could provide a cost-effective and accessible means of protecting against age-related cognitive decline. These findings have led to the global initiative for dementia risk reduction: World-Wide FINGERS (WW-FINGERS). As part of this collaboration, the AU-ARROW trial is designed to mirror the structure of the United States study (US-POINTER), also a part of the WW-FINGERS network, while allowing for Australian cultural and dietary adaptations to determine the intervention’s generalisability, adaptability and sustainability in an Australian setting.

The AU-ARROW study is expected to provide an evidence-based innovative treatment plan to reduce cognitive decline and dementia risk, and it is hoped these research outcomes will be developed into Australian health policy and clinical practice. Biomarker research is expected to provide validation of some (and discovery of other) blood, urine, retinal and other diagnostic biomarkers for faster and more cost-effective screening, that will assist in studies and eventually implementation of cognitive enhancing strategies in the ageing population.

2  
**The use of medium-chain fatty acids as a prevention or intervention for Alzheimer’s disease: Past, Current, and Future**

Heidi Hillebrandt, PhD Student, Macquarie Medical School, Macquarie University

Heidi L. Hillebrandt1,2, Cintia B. Dias, Edward S. Barin3, Pratishtha Chaterjee1,2, Tejal M. Shah1,2, Ann M. Bacsí3, Jason Kaplan3, Hamid R. Sohrabi1,5, Ralph N. Martins1,2,5

1 Macquarie University, Department of Biomedical Sciences, Sydney, NSW, Australia
2 Macquarie University, Centre for Ageing, Cognition and Wellbeing, Sydney, NSW, Australia
3 Macquarie University, Department of Clinical Medicine, Sydney, NSW, Australia
4 Murdoch University, Centre for Healthy Ageing, Murdoch, WA, Australia
5 Edith Cowan University, School of Medicine and Health Sciences, Perth, WA, Australia
Background: Medium-chain fatty acids (MCFA) are quickly absorbed and transported to the liver. Where they are preferentially metabolised into energy and ketone bodies, as compared to long-chain fatty acids. Ketone bodies are then transported to the brain and other tissues for energy supply. This makes MCFA the ideal energy source for patients with conditions in which energy deprivation is observed, such as Alzheimer’s disease (AD). In AD, insulin resistance in the brain causes partial glucose deprivation. However, the brain is still able use ketone bodies for energy.

Methods: The current study involved 20 healthy adults aged 50 to 77 years. Participants consumed 3 daily doses of MCFA rich oil (40% caprylic acid, 28% capric acid, 32% lauric acid) for 7 weeks. Over the course of the study, participants had their anthropometric measurements taken, donated fasting blood and underwent a 2-hour postprandial analysis. They also completed cognitive testing at baseline, mid-way, and end-of-intervention. Participants were free to discontinue at any time.

Result: Statistically significant results were shown in post-prandial ketone bodies, with no significant changes reported in blood lipids and body mass index. Further, statistically significant results were observed in measures of cognition relating to inhibition, working memory, and set shifting.

Conclusion: Supplementation with MCFA rich oil may provide backup energy to a glucose deprived brain, and may further help in the prevention of AD. This study supports previous research findings, and highlights the need to explore the future of dietary intervention for the prevention or treatment of AD.

3

Development of a Wellbeing Check to improve detection and treatment of risks for dementia and poor wellbeing in older adults.

Professor Viviana Wuthrich, Department of Psychological Sciences, Macquarie University

Lifestyle and psychological factors have been associated with increased risk for developing dementia as well as poor general mental, social and physical wellbeing in later life. Further there is emerging evidence that if these risk factors are identified and treated, it may reduce the risk for both the development of dementia, as well as poor wellbeing. Despite this, there is limited understanding of how to identify and treat these common risks at a population level. This presentation will outline a novel method for increasing access to routine risk screening and early intervention in older adults in primary care settings. Utilising existing medical data from GP software, integrated with data related to additional risk factors, a potential model for large scale screening and interventions is proposed. In conjunction with the Sydney North Primary Health Network, in a series of projects this novel tool will be developed and evaluated. With the ageing of the Australian population, strategies to maintain healthy ageing are a priority. This new study will help to better identify individuals at risk and engage patients in preventative medicine approaches that offer the potential to result in wide scale risk reduction for cognitive decline and poor wellbeing in later life.

4

Older Adults’ Attitudes to Dementia Risk Reduction in Primary Care

Dr Diana Matovic, Postdoctoral researcher, Department of Psychology, Macquarie University
Do older adults want to know their risk of developing dementia based on their lifestyle factors? Would they be willing to make lifestyle changes to reduce their risk of developing dementia? Livingston et al.’s (2020) Lancet Commission paper systematically reviewed modifiable risk factors for dementia to identify 12 lifestyle and environmental factors that could potentially reduce a person’s risk of developing dementia by up to 40%. As such, research is focused on increasing identification of at-risk individuals so that these modifiable factors can be treated. Risk screening in primary care is a potentially feasible approach to maximise identification and treatment of the risks. As a primary aim, it is important to understand older adults’ (≥ 60 years) attitudes towards receiving risk screening and their willingness to make changes on modifiable risk factors to ensure that screening and interventions have high adherence and efficacy. We also aim to examine individual differences that may facilitate or impede the willingness to undergo screening, including family history of dementia, depression and anxiety, and social support networks. We also aim to investigate how attitudes and motivations towards risk reduction may change after receiving general information about modifiable risk factors for dementia. The results will be partially descriptive. Regression and moderation analyses will also be used to explain variance in willingness to receive information on modifiable risk and belief that this information is helpful.

This project is a collaborative, also involving Professor Viviana Wuthrich, +61 (02) 9850 4866, viviana.wuthrich@mq.edu.au, Dr Carly Johnco, +61 (02) 9850 8053, carly.johnco@mq.edu.au, Professor Kerry Sherman, +61 (02) 9850 6874, kerry.sherman@mq.edu.au, and Dr Christopher Kilby, chris.kilby@cairnmillar.edu.au.

5 Understanding predictors of dementia literacy and motivation to change lifestyle in older Australians

Joyce Siette1 and Laura Dodds1

1 Centre for Health Systems and Safety Research, Australian Institute of Health Innovation, Macquarie University

Introduction. Recent research suggests that public knowledge of dementia and its relationship between lifestyle and brain health is limited. Our aim was to identify the sociodemographic characteristics associated with dementia literacy and motivational factors to support behaviour change in an Australian older adult sample.

Methods. A cross-sectional online and postal survey was administered to community-dwelling older adults in New South Wales between January and March 2021, on dementia literacy (adapted survey from the British Social Attitude Survey) and motivation (Motivation to Change Lifestyle and Health Behaviours for Dementia Risk Reduction). Chi-square tests were used to identify the association between sociodemographic factors and dementia literacy and motivation.

Results. A total of 847 older adults (mean age 73.3, SD=6.0, range 65-94) completed the survey. Most participants (61%) were aware of the association between lifestyle factors and
dementia risk. A large majority of respondents identified cognitive (85.0%) and physical inactivity (83.4%) as dementia risk factors and were less able to identify cardiovascular-related factors (e.g., chronic kidney disease, 15.8%). There were no significant sociodemographic factors associated with dementia literacy (ps>0.05). Motivation to change health and lifestyle was typically high. Individuals who were younger (<75 years), had high socioeconomic status and were residing in metropolitan areas were more likely to have higher general health motivation (ps<0.05) and perceived fewer barriers to change (ps<0.05).

Conclusions. Dementia awareness was highly prevalent. A multifaceted approach consisting of internal and external prompts targeting specific subgroups may be suitable for future dementia risk reduction interventions.

6

NECESSARY BUT NOT SUFFICIENT: EXAMINATION OF THE SATISFACTION OF ONLINE SOCIAL CONTACT IN OLDER ADULTS DURING COVID-19
Dr Jessamine Chen, Postdoctoral Researcher, Department of Psychological Sciences, Macquarie University

Introduction/Background: Government enforced lockdowns and physical distancing guidelines related to the COVID-19 pandemic have resulted in temporary closure of local community groups and suspension of social activities. Many community groups have subsequently looked to online technologies and digital resources to provide virtual-social support network. This study examined how older adults adapted social activities to the COVID-19 public health restrictions, and the impact of these changes on their satisfaction and connectedness with social activity groups.

Methods: 126 community-dwelling older adults (≥60 years) completed self-report questionnaires assessing participation in social groups (sporting, hobby, community, volunteering, religious, culture) in terms of participation frequency, format of participation, satisfaction and feelings of connectedness with the groups, quality of life, changes in social network, changes in social relationships, and uptake of new technology.

Results & Conclusion: Up to 64% of older adults continued engaging or re-engaged in social group activities but changed format of participation (from face-to-face to online). Older adults who changed format of participation reported reduced satisfaction and connectedness with cultural and meal sharing group activities from pre- to post-lockdown more so compared to participants who continued engaging or re-engaged in these social activities using the same format of participation. No significant differences in satisfaction or connectedness were observed between those who changed format and those who used the same format for sporting, community, religious, volunteering, or other social activities. Qualitative data suggested that while online social contact/participation was necessary, it may not be sufficient for maintaining social connectedness.
Using online learning and holistic advice to improve retirement decisions

Professor Joanne Earl, Department of Psychological Sciences, Macquarie University

Researchers: Joanne K Earl (Macquarie University), Anna Mooney (Macquarie University), Paul Gerrans (UWA), and Chanaka Wijeratne (UNSW)

This presentation describes an intervention funded by an ARC Linkage grant and Allianz Retire + aimed at helping people make more informed decisions about retirement, and in particular, when to leave work. Our project team reflects the multidisciplinary nature of retirement decisions including researchers from Psychology, Medicine and Finance. There are three important community facts informing the project. Firstly, many people leave work with insufficient funds and then find themselves back out looking for work. Ageist attitudes may make this task more difficult. Secondly about 20% of people will retire from the workforce due to ill-health. Thirdly, when meeting with a financial adviser some people may have preconceived notion about a retirement date without reflecting upon why they want to retire or what they plan to do next.

We present the findings from a pilot study involving online training modules offered alongside career and financial advice. In the first wave older workers explore career options and are challenged about their elected retirement date by a careers adviser, they then undertake a medical and reflect on their own health status, and finally they meet with a financial adviser to answer any general questions they have about finances in retirement. It is our plan to include 60 people in a pilot study in August 2021, in anticipation of the main study in 2022. From our study we hope to identify the benefits of online training modules and advice to improve decision certainty about workplace exit resulting in better decisions for retirement.

Reminiscence therapy

Prof Sunil Bhar, Department of Psychology, Swinburne University

Reminiscence therapy is an evidence based treatment for late life depression. However, this therapy is rarely taught in formal programs of psychology, counselling or social work. This presentation provides an overview of reminiscence therapy and storytelling approaches. It defines these approaches, and provides instructions and resources for applying these approaches with older adults living in community or residential settings. Case studies, research studies and discussion will be used: to illustrate key concepts, to show how to customise such approaches to suit client needs, and to overcome clinical and ethical obstacles in using reminiscence for improving health outcomes in older clients.

Long-term relapse after cognitive behaviour therapy for late-life anxiety and depressive disorders.

Dr Carly Johnco, Senior Research Fellow, Department of Psychological Sciences, Macquarie University
Aim: This study assessed the long-term symptom relapse rates among older adults previously treated with cognitive behaviour therapy (CBT) for anxiety and/or depression during COVID-19.

Methods: Participants were 37 older adults (M = 75 years, SD = 5; 65% female) previously treated with CBT for anxiety and/or unipolar depression who were re-assessed an average of 5.6 years later, during the first Australian COVID-19 lockdown.

Results: On average, there was no significant group-level change in anxiety, depression or quality of life from post-treatment. When assessing change in symptoms based on clinical cut-off points on self-report measures, results suggest only 17%-22% showed a relapse of symptoms by the COVID-19 pandemic.

Conclusions: Findings suggest that CBT may be protective in coping with life stressors many years after treatment ends. However, results warrant replication to attribute continued symptom improvement to CBT given the lack of control group.

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Hearing and vision impairments in residents of Australian aged care settings

Dr Amanda Miller Amberber, Postdoctoral Research Fellow, Department of Linguistics, Macquarie University

Amanda Miller Amberber, Macquarie University, Piers Dawes, Macquarie University

BACKGROUND: Hearing and vision impairment (HeVI) affect up to 90% of older people in residential aged care settings overseas, impacting on quality of life, social and emotional well-being, independence, daily activities, and cognitive function. HeVI interventions are effective in improving outcomes. Unfortunately, low uptake of preventative hearing and vision care are reported for people in residential aged care (RACF) in Australia. The Aged Care Funding Instrument (ACFI) is managed by the Federal government and used by RACFs to assess the care needs of residents and allocate funding accordingly. A possible contributing factor for under-identification and support for HeVI needs of residents in Australia is under-recording of HeVI in ACFI assessments.

AIMS: To i) identify the recorded levels of HeVI among aged care residents according to national ACFI data and ii) examine associations between HeVI with level of care needs and activities of daily living, behaviour and complex health care needs.

METHODS: National ACFI records for 306,295 aged care residents for July 2019-June 2020 were analysed.

RESULTS: Implausibly low levels of HeVI were recorded for aged care residents in Australian RACFs. Although specific codes exist in ACFI records to distinguish low vision versus blindness in aged care residents, only a single code for hearing loss/deafness exists.

CONCLUSION: Accurate and timely identification of HeVI for older Australians in RACFs is a healthcare priority. Failure to address the current gaps in identification, assessment, and effective interventions has social, psychological and economic consequences for older people, their families and care providers.
Adverse events research in residential aged care predominately focuses on physical impacts experienced by older persons living in aged care. Yet the WHO definition of health describes health as not only as the absence of disease, but the intersection of physical, mental, and social wellbeing. This paper draws on evidence from (i) a scoping review of international literature on adverse events in residential aged care and (ii) a mixed-methods study on the types and rates of adverse events in Australian aged care facilities to provide an examination of the impacts of adverse events in residential aged care beyond physical injuries alone.

Of the 58 papers examined within the scoping review, papers focusing on personal, interpersonal, or environmental factors accounted for 32% of the research, and 10% of the studies used qualitative techniques. In a study of 60,268 adverse events among nearly 12,000 aged care residents in NSW and the ACT across three years, falls were the highest recorded incident (36%) however events where the instigating cause was related to behaviours, aggression or an adverse social interaction accounted for 33% of events experienced by residents. The high number of behaviour-related events and gaps within the research demonstrate that a more holistic view of the drivers and outcomes of adverse events is needed to ensure that the “health” of older persons in residential aged care is assessed not only in terms of falls, medication errors, and hospital admissions, but also includes measures of social and emotional aspects of health including personal wellbeing.

The relationship between hearing loss and third-party disability in older adult couples

Age-related hearing loss is related to poorer emotional health in affected individuals, but less is known about the effects on communication partners, especially spouses. The impact of one person’s disability on their surrounding network is known as third-party disability (TPD). TPD can be classified into four domains: the previously established areas of lifestyle changes, communication difficulties, emotional consequences, and our newly proposed area of cognitive load.

The aim of this study was to capture the degree of TPD across the four domains reported by spouses of older adults with hearing difficulties, compared to those without hearing difficulties.

Participants were aged 55 years or older and completed a set of standardised questionnaires online, collecting data about perceptions of their spouse’s hearing difficulties, the burden they experience related to their spouse’s hearing difficulties, their own emotional health, quality of life and subjective memory complaints.
We provide evidence of hearing-related TPD in the domains of lifestyle, communication and emotional consequences, as well as providing the first evidence of cognitive impacts.

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