INTRODUCTION

Dementia is the leading cause of death for Australian women, and the second most common cause of death among the overall population.

At present, an estimated 425,000 Australians are living with dementia. Without a medical breakthrough, this number is expected to increase to more than one million by 2050.

Since 2015, the NHMRC National Institute for Dementia Research (NNIDR) has been targeting, coordinating and translating the strategic expansion of dementia research in Australia. By collaborating with researchers; engaging those living with dementia in research efforts; and connecting with health professionals and policy makers, the NNIDR is committed to achieving the World Dementia Council’s international target—a five-year delay in the onset of dementia by 2025.

It is in this context that we present to you the full program and abstracts of the Australian Dementia Forum 2018: Cooperation, Collaboration and International Connections (ADF2018). The ADF2018 was held in Sydney on 4–5 June. Building on last year’s Forum success, the ADF2018 aimed to encourage collaboration and capacity building across Australia’s network of dementia researchers, and greater connection with international research teams, similarly dedicated to tackling the challenge of dementia.

Researchers submitted over 179 abstracts and of these 45 were selected for presentation at ADF2018, with a further 33 poster presentations across three poster sessions. Three international keynote speakers participated in ADF2018, with a further keynote address delivered by NHMRC Boosting Dementia Research Leadership Fellow, Dr Carol Dobson-Stone.

Our international keynotes, Dr Rachel Whitmer from the University of California Davis, Professor Joseph Gaugler from the University of Minnesota, and Dr Anne McKenzie from the University of Western Australia, in Research Workshop facilitated by Anne McKenzie.

The ADF2018 also included the Public Involvement and Living with Dementia. This roundtable will bring together existing and interested researchers in rehabilitation in dementia from a range of backgrounds including psychologists, occupational therapists, speech pathologists, physiotherapists and medical practitioners. The group will share current projects, identify potential synergies and methodological challenges, and kickstart new research ideas and collaborations.

There is also the possibility of working together on a book on the topic. The group will also discuss strategy and opportunities in contributing to advocacy efforts with regards to rehabilitation and dementia.

10.30am Roundtable 1.1 Rehabilitation in Dementia

Lee-Fay Low
University of Sydney, Sydney, NSW, Australia

This roundtable will bring together existing and interested researchers in rehabilitation in dementia from a range of backgrounds including psychologists, occupational therapists, speech pathologists, physiotherapists and medical practitioners. The group will share current projects, identify potential synergies and methodological challenges, and kickstart new research ideas and collaborations.

There is also the possibility of working together on a book on the topic. The group will also discuss strategy and opportunities in contributing to advocacy efforts with regards to rehabilitation and dementia.

10.30am Roundtable 1.2 Exercise is prevention: Recommendations and strategies for the implementation of exercise as a factor to reduce dementia risk

Dr Belinda Brown & A/Prof Jeremiah Peiffer
Murdock University, Western Australia

The purpose of this roundtable discussion, through engagement with researchers, policymakers, clinician and consumers, will be to evaluate the impact of exercise on cognitive health resulting in a position statement for the use of exercise as a preventative strategy for dementia. Further discussion will focus on identifying key implementation strategies necessary for the delivery of exercise interventions to the broader aged community. Information from this forum will be used to inform future policy and identify areas of needed research. Discussion of key funding opportunities and strategies to enhance funding success for exercise and dementia research will also be discussed.

12.30pm Lunch

1pm–3pm Roundtable 2.1 Safe and effective use of medicines in people living with dementia

Edwin Tan
Centre for Medicine Use and Safety, Monash University, Parkville, VIC

Lisa Kalisch Eilet
School of Pharmacy and Medical Sciences, University of South Australia, Adelaide, SA

Tuan Nguyen
School of Pharmacy and Medical Sciences, University of South Australia, Adelaide, SA

Julia Gilmartin-Thomas
School of Public Health and Preventive Medicine, Monash University, Melbourne

Emily Reeve
Institute of Medical Research, University of Sydney, Sydney, NSW

The roundtable session will bring together researchers and health professionals who have an interest in optimising medication use in people living with dementia. It will provide opportunities for local and international research collaboration, the development of new research directions in high priority areas, and the continuation of an ongoing special interest group on this topic.

1pm–3pm Roundtable 2.2 The long and winding path to prevention part 2: Collaboration and co-ordination of dementia prevention efforts

Helen Macpherson
Deakin University, Vic, Australia

This roundtable will discuss strategies for researchers to better engage consumers, community organisations, clinicians and policy makers in dementia prevention research. We will determine how we can more effectively share resources to maximise the impact of dementia prevention research. We will discuss opportunities to contribute to the upcoming Dementia Centre for Research Collaboration (DCRC) initiated interest groups and training program, as well as the International Research Network on Dementia Prevention (FRNPi). This roundtable will involve participants of the dementia prevention special interest group formed from the 2017 event. Clinicians, representatives from relevant government and NGOs including Dementia Australia and consumer advocacy groups will be invited to participate.

1pm–3pm Roundtable 2.3

10am–12pm Roundtable 1.1 Rehabilitation in Dementia

Lee-Fay Low
University of Sydney, Sydney, NSW, Australia

10am–12pm Roundtable 1.2 Exercise is prevention: Recommendations and strategies for the implementation of exercise as a factor to reduce dementia risk

Dr Belinda Brown & A/Prof Jeremiah Peiffer
Murdock University, Western Australia

10.30am Roundtable 1.1 Rehabilitation in Dementia

Lee-Fay Low
University of Sydney, Sydney, NSW, Australia

10.30am Roundtable 1.2 Exercise is prevention: Recommendations and strategies for the implementation of exercise as a factor to reduce dementia risk

Dr Belinda Brown & A/Prof Jeremiah Peiffer
Murdock University, Western Australia

12.30pm Lunch

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1pm–3pm Roundtable 2.3
PROGRAMME

Monday 4 June 2018

7am
Registration desk open

Joint Opening Sessions

8.30am
Welcome to Country

8.45am
Opening
Minister for Aged Care, the Hon Ken Wyatt MP (appearing via video link)

9am
Introduction to Plenary
Glenda Halliday

9.05am
Consumer Presentation — the lived experience of dementia
Isabelle Burke

9.15am
Keynote address
Dr Rachel Whitmer

9.15am
Rapid Fire Presentations

10am
Isogenic induced pluripotent stem cells to model of Alzheimer’s disease
Dr Damian Hernandez

10.05am
Detection of dopamine using fluorescent nanosensors
Dr Olga Shimoni

10.10am
Anticholinergic burden is associated with negative health outcomes in elderly Aboriginal people
Dr Karen Mate

10.15am
Does statin use affect cognition in older adults? A pilot N-of-1 deprescribing trial
Mr Alexander Clough

10.20am
Brain Training: A question of more than just efficacy
Ms Nicole Ee

10.25am
The “Music, Mind and Movement (MMM)” Program for People with Dementia
Ms Olivia Brancatisano

10.30am
Morning tea

Parallel Sessions 1

Theme: Prevention
Chairs: Professor Kaarin Anstey & Dr Ashleigh Smith

11am
Group presentation: three international consortia of cognitive ageing and dementia studies
Led by Dr Darren Lipnicki

11.30am
Evidence to inform global dementia risk reduction policy and guidelines: An umbrella review of 103 meta-analyses of 32 risk factors for Alzheimer’s disease, vascular dementia and any dementia
Prof Kaarin Anstey

11.45am
Longitudinal association of antihypertensive agent choice and brain atrophy
Dr Chris Moran

12pm
Antihypertensives and cognitive function, a systematic review and meta-analysis
Dr Ruth Peters

12.15pm
Hearing loss and the risk of dementia in later life
Dr Andrew Ford

12.30pm
Lunch

Theme: Care
Chairs: Professor Henry Brodaty & Dr Kylie Radford

11am
Initiation of antipsychotic medicines in older Australians during hospital admission
Dr Lisa Kalisch Etlet

11.15am
The effect of xerostomic medication on oral health in persons with dementia: findings from the Swedish
Dr Edwin Tan

11.30am
Oral health screen may decrease aspiration pneumonia risk for adults with dementia in residential aged care
Dr Lynette Goldberg

11.45am
Good Spirit, Good Life: A quality of life tool for Aboriginal Australians with Cognitive Impairment
Dr Kate Smith

12pm
The “Golden Angels” Effects of trained volunteers on patient and family carer outcomes for people with dementia and delirium in rural hospitals
Ms Annaleise Blair

12.15pm
Promoting Independence Through quality dementia Care at Home (PITCH): a co-designed project
A/Prof Briony Dow

12.30pm
Lunch
1.30pm  
Themed Poster Session  
Prevention & Care & Living with Dementia

Parallel Sessions 2

Prevention  
Chairs: Professor Kaarin Anstey & Dr Ashleigh Smith

2pm  
Association between a dietary inflammatory index and brain MRI biomarkers — the Cognition and Diabetes in Older Tasmanians study  
Miss Fateme Zabetiantarghi

2.15pm  
Cerebral atrophy in patients with type 2 diabetes and left ventricular hypertrophy: preliminary data  
Dr Sheila K Patel

2.30pm  
The potential of the Mediterranean diet for the prevention of dementia in Australia: Research findings, implementation and challenges  
Ms Alexandra Wade

2.45pm  
A decade of collaboration between researchers, health services and Aboriginal communities to understand ageing and dementia  
Dr Kylie Radford

Parallel Sessions 2

Care  
Chairs: Professor Henry Brodaty & Dr Kylie Radford

2pm  
Making the Economic Case for Interventions for Dementia: What Now and What Next for Model-Based Evaluations  
Prof Colin Green

2.15pm  
Facilitating family informed hospital care for the person with dementia  
A/Prof Christine Toye

2.30pm  
Adapting the World Health Organisation iSupport program to the Australian socio-cultural context: A pilot study  
A/Prof Lily Xiao

2.45pm  
Collaborations in Care: Consumer engagement from research question to implementation  
Prof Susan Kurrle

3pm  
Afternoon Tea

Joint Closing Sessions

3.30pm  
Introduction to Plenary  
Elizabeth Beattie

3.35pm  
Consumer Presentation — the lived experience of dementia  
John Quinn and Glenys Petrie

3.45pm  
Keynote address  
Advancing dementia caregiving research: A synthesis and consideration of current recommendations  
Professor Joseph Gaugler

4.30pm  
Panel discussion: Translation to Care  
Chair: Elizabeth Beattie  
Simon Denegri, Professor Joseph Gaugler, Dr Maria O’Reilly, Dr Theresa Scott

5.30pm  
Monday Program concludes

5.30pm–7.30pm  
Welcome Reception
Tuesday 5 June 2018

7am
Registration desk open

Joint Opening Sessions

8.30am
Introduction to Plenary
Dr Jane Thompson

8.35am
Consumer Involvement in Research Presentation
Theresa Flavin, interviewed by Maree McCabe, Dementia Australia CEO

8.45am
Keynote address
Partners in time: dementia and public involvement in research
Simon Denegri

Parallel Sessions 3
Living with Dementia
Chairs: Dr Lee-Fay Low & Dr Clement Loy

9.30am
Supported decision-making in the context of dementia
Dr Damian Hernandez

9.45am
Rights based care and support
Ms Sue Pieters-Hawke

10am
Research into practice: The journey towards Brisbane Airport becoming “Dementia Friendly”
Dr Maria O’Reilly

10.15am
Making the invisible companion of people with dementia visible in economic studies: what is clinical research teaching us?
Dr Kim-Huong Nguyen

10.30am
Morning tea

Parallel Sessions 4
Assessment & Diagnosis
Chairs: Dr Shelley Forrest & Dr Yen Ying Lim

11am
Group Presentation: Imaging and data platform for dementia research
Ms Amy Shepherd

11.30am
NIA/AA Research Framework: Towards a biological definition of Alzheimer’s disease. Implications for research and diagnosis
Prof Christopher Rowe

11.45am
Mixed pathology in Alzheimer’s disease
Prof Glenda Halliday

12pm
Lunch

Parallel Sessions 4
Intervention & Treatment
Chairs: Dr Genevieve Steiner & Annette Moxey

11am
CogTale: A novel repository of cognition-oriented treatment trials
Dr Alex Bahar-Fuchs

11.15am
The Dementia Care in Hospitals Program (DCHP) — Collaboration driving sustainability and national spread
A/Prof Mark Yates

11.30am
Improving medication use for people with dementia and the need of a new model of care
Dr Tuan Anh Nguyen

11.45am
α1-adrenoceptors: Investigating Novel Drug Targets for Alzheimer’s diseases
Ms Alaa Abdul-Ridha

12pm
Rectifying functional connectivity in mild cognitive impairment using brain stimulation: Which regions should be targeted?
Dr Leonardo Gollo

12.15pm
Longitudinal assessment of attentional deficits following stroke in rodent models
Dr Katrina O’Brien

12.30pm
Lunch

Parallel Sessions 3
Intervention & Treatment
Chairs: Dr Lee-Fay Low & Dr Clement Loy

9.30am
Comprehensive touchscreen cognitive characterisation of APP/PS1 mouse model of Alzheimer’s disease reveals subtle and progressive impairments
Ms Amy Shepherd

9.45am
Does stroke induce remote brain atrophy in mice?
Dr Vanessa Helena Brait

10am
Distinct microglial molecular and functional phenotypes in Alzheimer’s disease are controlled by amyloid plaque phagocytosis
Dr Alexandra Grubman

10.15am
Scanning Ultrasound as a novel treatment modality for Alzheimer’s disease
Prof Jürgen Götz

10.30am
Morning tea
1.30pm
Themed Poster Session
Assessment & Diagnosis, Intervention & Treatment

Parallel Sessions 5
Assessment & Diagnosis
Chairs: Dr Shelley Forrest & Dr. Yen Ying Lim

2pm
Prevalence of dementia and survival with dementia in people entering residential aged care in Australia: trends from 2008 to 2014
Dr Stephanie Harrison

2.15pm
Ethnicity and Alzheimer’s disease: A global perspective
Prof Peter Panegyres

2.30pm
Cognitive assessment to support dementia diagnosis in Aboriginal Australians
Ms Louise Lavrencic

2.45pm
Indigenous Community Approaches to the Development of Assessment Tools for Cognition: An International Perspective
A/Prof Dina LoGiudice

3pm
Afternoon Tea

Joint Closing Sessions
3.30pm
Introduction to Plenary
Janice Besch

3.35pm
Consumer Group Presentation — the lived experience of dementia
Dr Ron Sinclair, Danijela Hlis, Elaine Todd and Ian Gladstone

3.45pm
Keynote address
Genetics: hopes and hurdles in dementia research
Dr Carol Dobson-Stone

4.30pm
Awards & Closing
Janice Besch
KEYNOTE SPEAKERS

**SIMON DENEGRI**
Simon Denegri OBE is National Director for Patients, Carers and the Public in Research at the National Institute for Health Research (NIHR).

Simon was Chair of INVOLVE — the national advisory group for the promotion and support of public involvement in research funded by NIHR — from 2011 until 2017. Simon was Chief Executive of the Association of Medical Research Charities (AMRC) from 2006 until 2011 and, prior to this, Director of Corporate Communications at the Royal College of Physicians from 2003. Simon also worked in corporate communications for Procter & Gamble in the United States from 1997 to 2000.

Simon writes and speaks extensively about community and public involvement in health and social care and blogs at simon.denegri.com. Simon also writes poetry which he publishes at otherwiseknownasdotcom.wordpress.com. Simon was awarded the OBE in the Queen’s Birthday Honours 2018.

**DR CAROL DOBSON-STONE**
Carol Dobson-Stone, DPhil, is an NHMRC Boosting Dementia Research Leadership Fellow, based at the University of Sydney.

Dr Dobson-Stone completed her PhD in human genetics at the University of Oxford, UK, in 2004. Shortly thereafter, she was awarded a European Molecular Biology Organisation Fellowship to work on brain function genetics at the Garvan Institute of Medical Research, moving to Neuroscience Research Australia in 2006. She was appointed as a Senior Research Fellow to the Brain and Mind Centre at the University of Sydney in 2017. Dr Dobson-Stone is a molecular geneticist and has led several NHMRC Project Grants examining genes that are mutated in dementia and related neurodegeneration, particularly frontotemporal dementia and motor neuron disease/amyotrophic lateral sclerosis. Her research straddles multiple steps on the pathway from genetic disease to targeted therapy. She uses next-generation sequencing data from dementia patients to identify potentially pathogenic DNA variants in candidate genes. She is developing high-throughput cellular assays of dementia-relevant biological phenotypes, in order to determine pathogenicity of DNA variants. Her work also involves in-depth characterisation of candidate disease genes using molecular biological and cell culture assays.

**PROFESSOR JOSEPH GAUGLER**
Dr Joseph E. Gaugler, PhD is the Robert L. Kane Endowed Chair and Long-Term Care Professor in Nursing at the University of Minnesota.

Dr Gaugler’s research examines the sources and effectiveness of long-term care for persons with Alzheimer’s disease and other chronic conditions. An applied gerontologist, Dr Gaugler’s interests include Alzheimer’s disease and long-term care, the longitudinal ramifications of family care for persons with dementia and other chronic conditions, and the effectiveness of community-based and psychosocial services for older adults with dementia and their caregiving families. Underpinning these substantive areas, Dr Gaugler also has interests in longitudinal and mixed methods.

**PROFESSOR RACHEL WHITMER**

Rachel Whitmer, PhD, is Professor Public Health Sciences, Chief Division of Epidemiology at University of California Davis.

Dr Whitmer received her BS in Psychology/Neuroscience Magna Cum Laude from the University of Massachusetts, Amherst, her PhD in Human Development from the University of California, Davis, and Fellowship in Cardiovascular Epidemiology at the School of Public Health, University of California, Berkeley. Dr Whitmer was a K12 scholar through the NIH Office of Research in Women’s Health Building Interdisciplinary Research Careers in Women’s Health (BIRCWH) program, administered by the Division of Research at Kaiser Permanente and the University of California, San Francisco, from 2003–2005. She was a Fulbright Faculty Mentor in 2010–11. Dr Whitmer leads a laboratory of population-based science in brain aging. Her group focuses on the following themes: Ethnic/racial disparities and diversity in cognitive aging and dementia outcomes, Early-life contributions to brain health and dementia risk, and Metabolic and vascular influences on brain aging. Her group utilizes life course methods to address these themes. Dr Whitmer is Principal Investigator of several studies, among them the SOLID (Study of Longevity in Diabetes), a cohort study of 1200 individuals with diabetes mellitus; KHANDLE (Kaiser Healthy Aging and Diverse Life Experiences), a multiethnic cohort of 1,800 elderly individuals; and Kaiser STAR (Study of Healthy Aging in African Americans), a cohort of 700 African Americans age 50 and older. The primary objective of her research program is to identify and understand risk and protective factors for cognitive and brain aging in populations at high risk for dementia, including ethnic minority groups and those with chronic disease such as diabetes mellitus.
G protein-coupled receptors (GPCRs) comprise the largest family of cell-surface receptors and play critical roles in brain neurotransmitter systems that are disrupted in Alzheimer’s disease (AD) and related neurodegenerative diseases. GPCRs also affect the major hallmarks of AD pathology, regulating the formation of neurofibrillary tangles and neurites. Currently, there are no approved GPCR targeting drugs for treating AD or its symptoms. The adrenoceptors (ARs) are a family of G protein-coupled receptors (GPCRs) that modulate the cardiovascular and nervous systems in response to binding adrenaline and noradrenaline. The ARs are divided into three subfamilies (β-AR, α1A-AR and α1D-AR) which are further divided into subtypes. Of particular interest are the β1A-AR, β1B-AR and β1D-AR subtypes, which are the most abundant ARs in the brain and are emerging therapeutic targets for AD and other neurodegenerative diseases. Although the α1-ARs are targeted clinically by non-selective β1-AR blockers for treating hypertension and benign prostatic hyperplasia, their individual roles remain poorly understood due to the lack of subtype selective ligands. Evidence suggests that activation of β1A-AR is neuroprotective, whereas chronic β1B-AR stimulation leads to neurodegeneration. Subtype selective ligands are required however, to further our understanding of the physiological role of individual receptors and validate their potential as therapeutic targets for AD. We used state-of-the-art biophysical screening methods and identified several novel and subtype selective compounds for the β1-ARs. These compounds represent ideal starting points for further optimisation and structure-activity studies. Interestingly, two of these novel compounds exhibit dual functionality, as they act as partial agonists at β1A-AR and antagonists at β1B-AR. These compounds are currently being characterised and optimized for animal studies, as they may represent hits with potential for lead development in treating AD and AD symptoms.
Dementia and cognitive impairment are becoming increasingly recognised as major post-stroke sequelae. It is not known if they are a direct consequence of the stroke, or of chronic mid-life risk factors. We hypothesised that these are linked to brain atrophy observed after stroke, and aimed to test this in animal models, that these are linked to brain atrophy observed after stroke in mice. Male C57Bl6J mice were exposed to a 30-minute intraluminal filament-induced middle cerebral artery occlusion (MCAO). T2-weighted MRI scans (4.7T Bruker Biospin) were performed at baseline and 1, 4, 12, 24, 36 and 48 weeks post-stroke. Regions-of-interest were manually delineated at all time-points. We found significant atrophy in the ipsilateral cortex at 4 to 48 weeks post-stroke compared with sham-operated mice. Significant atrophy was measured in the ipsilateral hippocampus at all time-points from 4 weeks post-stroke compared with sham-operated mice, but only when the hippocampus was directly affected by the infarct. Interestingly, in the sham-operated mice, there was an increase in both right and left hippocampal volume at 24 weeks post-surgery that remained elevated up until 48 weeks. This same pattern was observed in the contralateral hippocampus of stroke mice, as well as the ipsilateral hippocampus of strokeed mice in which the hippocampus was not directly affected by the infarct. These findings suggest that in normal mice the stroke lesion itself does not produce brain volume changes remote to infarct-affected areas. Instead, our findings demonstrate novel temporal cortical and hippocampal volume changes up to 48-weeks post-sham and-MCAO.

Dr Vanessa Helena Braith
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Theme: Intervention and Treatment
Does stroke induce remote brain atrophy in mice?
Vanessa H Braith, David K Wright, Charlotte M Ermine, Katrina R O’Brien, Lachlan H Thompson, Jess Nithinanthanarajah, Katherine A Jackman, Amy Brodtmann
The Florey Institute of Neuroscience and Mental Health, University of Melbourne, Parkville, VIC, Australia
Leigh A Johnston
The Florey Institute of Neuroscience and Mental Health, University of Melbourne, Parkville, VIC; Australia

Melbourne Neuropsychiatry Centre; Parkville, VIC, Australia

The University of Melbourne, Parkville, VIC, Australia; Mental Health Service, Royal Freemasons, Melbourne, VIC, Australia

The University of Melbourne, Parkville, VIC, Australia; School of Psychology, The University of Queensland; Department of Neurology, Royal Brisbane & Woman's Hospital

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Theme: Intervention and Treatment
An Integrated Approach to Management of Behavioural and Psychological Symptoms in Dementia

Dementia and cognitive impairment are becoming increasingly recognised as major post-stroke sequelae. It is not known if they are a direct consequence of the stroke, or of chronic mid-life risk factors. We hypothesised that these are linked to brain atrophy observed after stroke, and aimed to test this in animal models, that these are linked to brain atrophy observed after stroke in mice. Male C57Bl6J mice were exposed to a 30-minute intraluminal filament-induced middle cerebral artery occlusion (MCAO). T2-weighted MRI scans (4.7T Bruker Biospin) were performed at baseline and 1, 4, 12, 24, 36 and 48 weeks post-stroke. Regions-of-interest were manually delineated at all time-points. We found significant atrophy in the ipsilateral cortex at 4 to 48 weeks post-stroke compared with sham-operated mice. Significant atrophy was measured in the ipsilateral hippocampus at all time-points from 4 weeks post-stroke compared with sham-operated mice, but only when the hippocampus was directly affected by the infarct. Interestingly, in the sham-operated mice, there was an increase in both right and left hippocampal volume at 24 weeks post-surgery that remained elevated up until 48 weeks. This same pattern was observed in the contralateral hippocampus of stroke mice, as well as the ipsilateral hippocampus of strokeed mice in which the hippocampus was not directly affected by the infarct. These findings suggest that in normal mice the stroke lesion itself does not produce brain volume changes remote to infarct-affected areas. Instead, our findings demonstrate novel temporal cortical and hippocampal volume changes up to 48-weeks post-sham and-MCAO.

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Theme: Intervention and Treatment
An Integrated Approach to Management of Behavioural and Psychological Symptoms in Dementia

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Behavioural and Psychological Symptoms in Dementia (BPSD) contribute to an increased burden in residential aged care (RAC). Psychotropics are highly prescribed for management of BPSD; however, inappropriate prescriptions may lead to serious adverse effects. Novel collaborative approaches are required to successfully manage BPSD. This research assessed psychotropic prescribing in dementia and developed alternative interventions to reduce BPSD. Out of 779 persons living in RAC facilities (OR=2.01, 95%CI=1.07-3.76, p=0.030) and psychosis were twice as likely to be prescribed for agitation (OR=1.89, 95%CI=1.23-2.87, p=0.004). Reasons for prescribing suggested that residents with dementia were twice as likely to be prescribed with antidepressants (OR=1.50, 95%CI=1.09-2.09, p=0.014) and antipsychotics (OR=1.89, 95%CI=1.23-2.87, p=0.004). Reasons for prescribing suggested that residents with dementia were twice as likely to be prescribed with antidepressants (OR=2.11, 95%CI=1.05-4.26, p=0.036). An intergenerational pilot intervention, the Good Neighbour Program (GNP), was developed pairing psychology undergraduates (N=14) with RAC residents (N=64). The GNP demonstrated positive outcomes for students, residents and RAC staff (N=38) using mixed methods. A second pilot intervention was trialled in RAC residents in a different facility (N=37) using virtual reality (VR) immersive environments for relaxation. Outcomes using mixed methods suggested feasibility of VR applications in dementia with decreasing resident apathy and providing the opportunity for reminiscence. Our new psychosocial and innovative technology assisted interventions appear promising to reduce BPSD. Large scale controlled trials are planned to further evaluate efficacy of these new interventions in dementia.

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Theme: Careers
Promoting Independence Through quality dementia Care at Home (PITCH): a co-designed project

Briony Dow, David Ames, Sue Malta
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Brendan Hallam, Colleen Doyle, Anita Panayiotou, Frances Batchelor, Luke Gahan, Ellen Gaffy
Margaret Wimbolt
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Steven Savvas
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Jason Burton
Alzheimer’s WA, Western Australia, Australia

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Sam Scherer
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Melbourne Neuropsychiatry Centre; Parkville, VIC, Australia

Jay Stiles
National Ageing Research Institute, Parkville, VIC, Australia; Division of Psychiatry, University College London, London

Anne Fairhall
Family carer representative; Project advisory group chair

Anita M Y Goh
National Ageing Research Institute, Parkville, VIC, Australia; The University of Melbourne, Parkville, VIC, Australia; Melbourne Neuropsychiatry Centre; Parkville, VIC, Australia

This project aims to improve outcomes for people living with dementia and their paid and family carers by co-designing and testing an evidence-based specialist training program for community dementia care — the “PITCH program”. Our co-design process involves people living with dementia, carers, home care workers, case managers and service providers as active research partners in all facets of the project, to help ensure the final PITCH program meets their needs and is usable. We plan that this program will directly benefit people living with dementia and their carers by up-skilling home care workers to provide care that promotes independence, improves quality of life, and reduces carer burden. The project team is diverse, from Victoria, NSW, Perth, the USA and UK. Effective collaborations with service providers (Australian Unity, Benetas, Bluecross, Royal Freemasons, Vila Maria Catholic Homes) are in place. A family carer of someone living with dementia leads the project advisory group, which consists of people living with dementia, family carers, and representatives from the following fields: health professional, home care professional, aged and community services, CALD community, DHHS, and aged care education. We will present results of focus groups and interviews held with these stakeholders about their perceptions of home care, how they are currently experiencing home care, and how their experience could be improved. The presentation will also describe what they think are the main elements that should be included in the PITCH program to effect a highly skilled, knowledgeable and empathic workforce delivering home care support services.
There is growing demand for evidence-based dementia education to enable more effective dementia care as well as wider adoption of strategies to prevent dementia. The Wicking Dementia Research and Education Centre developed the Understanding Dementia Massive Open Online Course (UD-MOOC) to increase knowledge of dementia and person-centred care practices, particularly for those providing care. The Centre’s Preventing Dementia MOOC (PD-MOOC) was developed to educate people with an interest in reducing their own risk, as well as those providing related health services, on the scientific basis of dementia risk reduction. Six iterations of the UD-MOOC from 2013 to 2017 attracted a total of 119,611 enrolments, with 47,793 (40%) completing the course. Two offerings of the PD-MOOC in 2016 and 2017 attracted 27,048 enrolments and 13,778 (51%) completed. Around one third of MOOC participants were international. In their feedback on completion, 76% of 2017 UD-MOOC and 75% of 2017 PD-MOOC feedback survey respondents agreed they had already applied the knowledge gained from the MOOC. In addition to having increased knowledge, UD-MOOC completers specified they were changing care practices, while PD-MOOC completers specified they were increasing risk reduction related behaviours. One of the most common ways of applying knowledge specified by participants of both MOOCs was sharing what they had learned with others. Thousands of MOOC participants globally have therefore become collaborators in our education efforts, helping to educate others and contributing to improving dementia care practices and reducing dementia risk, and potentially incidence, in the community.

Dementia is a major source of disability worldwide and there are currently no available disease-modifying treatments. Hearing loss may be associated with increased risk of dementia in later life and therefore could be a potentially modifiable risk factor given the availability of efficacious treatments. We investigated the association of hearing loss and dementia through two complementary approaches: a prospective, cohort study of 37898 older men (mean age 72.5±4.6 years) with a mean follow up of 11.1 years and a systematic review and meta-analysis of prospective studies. In our cohort, men with hearing loss were more likely to develop dementia (hazard ratio 1.69, 95%CI=1.54-1.85). The aggregated hazard of dementia was 1.49 (95%CI: 1.30-1.67) in those with hearing impairment (fourteen included studies). Study quality, duration and dementia type did not alter the results considerably. We found an increased risk of incident dementia with hearing impairment in both our novel data and the meta-analysis. This is an important finding, particularly in light of recent suggestions that mid-life hearing loss may account for up to 9.1% of dementia cases world-wide, and efforts to reduce its impact should continue to be explored.
Many adults with dementia in residential aged care are dependent on others for feeding and oral care. Langmore and colleagues in the United States have shown this co-related dependency is a strong predictor for aspiration pneumonia due to pathological oral microorganisms from saliva, tooth decay, and an unclean mouth migrating into the lungs and the inability of adults to cough and clear the aspirated material. The subsequent lung infection frequently results in hospitalisation and increasing frailty. One potential strategy to prevent this cascade is to screen the oral function of adults when they move into care. We present findings from Stage 1 of an NNIDR-funded oral health project where an interdisciplinary team screened 142 residents using the Oral Health Assessment Tool (OHAT), the Mini-Nutritional Assessment (MNA), the Yale Swallow Protocol, and the EuroQOL-5D-3L. Residents’ diagnoses, age, gender, prescribed medications, and clinical signs of potential aspiration were documented from medical files. Of the residents, 24% required oral care (n=42), 55% required oral care (n=79), and 21% required oral care (n=38). The prevalence of aspiration pneumonia was 22%, with 18% of residents with aspiration pneumonia and 4% of residents with aspiration pneumonia requiring hospitalisation. The results suggest that a multi-disciplinary approach is needed to identify, and address issues in oral health and function.

**Theme:** Care

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**References:**
- Langmore SE, Mason CE, McNulty KA, Shiel LC, Price MD. Self-reported quality of life ranged from 34–95% (M = 65%). The collaborative team of a speech pathologist, dentist, nutritionist and pharmacist was instrumental in assisting nurses and carers to screen for, identify, and address issues in oral health and function. Residents are being tracked to determine the outcome of reduced aspiration pneumonia risk and results will be known soon.

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Microglia are brain immune cells that remove cellular and extracellular debris and regulate synaptic plasticity, maturation and removal. Recently altered microglial genomics, epigenomics and functions emerged as key contributors to Alzheimer’s disease (AD). Nonetheless, whether toxic microglial inflammatory cytokine secretion and aberrant synapse overpruning outweigh the beneficial amyloid clearance functions of microglia in AD remains highly controversial. To address these questions, we explored whether functional differences in amyloid plaque phagocytosis in an AD mouse model result from or contribute to the underlying molecular and functional diversity of microglia in AD. Using a combination of bulk and single cell RNA-seq, proteomics and epigenomic approaches, we showed that the plaque phagocytic subset of microglia are molecularly distinct from physiological microglia and from non-plaque containing microglia in AD brains. Indeed, several later onset AD risk factors and their direct interacting partners are differentially expressed in plaque-containing microglia. To uncover the mechanism of induction and maintenance of this differential molecular phenotype, we used a chimeric organotypic hippocampal slice culture and FACS sorting approach, revealing that the altered transcriptional program can be activated in wild-type microglia by direct exposure to amyloid plaques in situ. Lastly, we show that plaque-phagocytic microglia in the dentate gyrus pruned significantly less synapses than nearby microglia not containing intracellular amyloid. Combined, our data identify distinct microglial signatures and their origin in AD mice, suggesting that plaque-containing microglia are beneficial despite their molecular divergence from physiological microglia, and thus enhancing their function may counteract microglia-dependent synapse overpruning in AD models.

**Objective:** To review the current literature on mixed pathology in AD and report findings of mixed pathology in longitudinally followed AD cases collected by the Sydney Brain Bank (SBB, N=217). Results: Population frequencies of AD pathologies show 50% with sparse tangle formation by age 50y and 50% with sparse amyloid deposition by age 70y. Mild cognitive impairment is related to more cerebrovascular disease rather than AD. In the SBB cohort, 76% of the AD cases had sufficient additional neuropathology at autopsy to reach diagnostic criteria for a second neurodegenerative disease. This is consistent with the 65–90% observed with a second neurodegenerative disease in many other datasets of longitudinally followed cases. Conclusion: Our data, and those of others, show that mixed pathologies dominate in people with clinical AD (more than 50% have multiple pathologies). Discussion: The main question then is the timing of these pathologies. This has not been answered for AD, but if the average age of clinical onset is 70y for AD, then this is a similar age when dementia occurs in patients with Lewy body disease, and also the age when the cumulative incidence of cerebrovascular disease rises sharply. Multiple pathologies in people with clinical AD are likely to reduce the success of any therapies targeting only AD.

**Objective:** To examine trends in the prevalence of dementia and the survival of those with dementia when entering residential aged care in Australia. Methods: A retrospective study using the national historical cohort of the Registry of Older South Australians (ROSA) was conducted. This cohort includes information on aged care recipients from the National Aged Care Data Clearinghouse linked with National Death Index data. The study sample (2008–2014) included people who started permanent residential care and dementia was identified according to the person’s most recent Aged Care Assessment Team (ACAT) or Aged Care Funding Instrument (ACFI) assessment. Generalized linear models adjusted for age and sex were used to estimate risk of mortality for people with dementia. Results: Between 2008 and 2014, 351,694 people entered residential aged care and had an available ACAT or ACFI assessment. The prevalence of dementia declined by an estimated -0.7% each year (95% confidence interval (CI): -0.8, -0.6), p < 0.001 for the overall cohort. One-year mortality rates increased from 2008 to 2014 for people living with dementia for females only (0.2% per year (95% CI 0.1, 0.4), p = 0.001). People living with dementia had a lower risk of 30-day, 90-day and one-year mortality (5-year mortality (95% CI): 0.86 (0.85, 0.87), p < 0.001). Conclusions: In Australia, for people entering residential aged care, dementia prevalence is declining and one-year mortality rates for women living with dementia are increasing. People living with dementia have a reduced risk of death in the first year of entering residential aged care compared to those without dementia.
Background: International research shows that antipsychotics are frequently initiated in hospital for people with dementia, and that use continues post-discharge even when there is no clear indication. We located no Australian studies on this topic. Aim: To identify the hospital admissions (excluding psychosis) associated with highest risk of antipsychotic initiation and continuation in a cohort of older Australians Methods: We conducted a retrospective analysis of Australian Government Department of Veterans’ Affairs administrative claims data. We included people admitted to hospital from 1 Jan 2014 to 31 Dec 2014, aged ≥65 years, who were antipsychotic naïve. We determined the number and type of hospital admissions associated with antipsychotic initiation. Where antipsychotics were initiated, we determined the time to cessation after discharge. Results: In 2014 there were 140,389 hospital admissions for 66,386 people who met our inclusion criteria. The median age at admission was 88 years (interquartile range 76–90 years) and 49.9% involved men. 733 (0.5%) of admissions were associated with antipsychotic initiation. When secondary diagnoses were considered, 47% (733/1,576) of admissions with antipsychotic initiation had delirium or dementia as a secondary diagnosis. For people who initiated antipsychotics during admission, only half had ceased within one year. Conclusion: Initiation of antipsychotics during hospital admissions was uncommon in our study population; amongst those who initiated, long-term use followed. Appropriate use of antipsychotics in people with delirium or dementia should be the focus of future research.

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Patients with frontotemporal dementia show profound changes in personality and behaviour. In asymptomatic gene carriers, the insula is one of the earliest regions of atrophy. This brain region is essential for integrating internal arousal and emotional experience. This collaboration between the University of Sydney and University of New South Wales aimed to improve diagnosis of frontotemporal dementia by assessing surfa ce facial electromyography (EMG) and skin conductance level (SCL) responses in 23 behavioural-variant frontotemporal dementia (bvFTD) patients, 14 semantic dementia (SD) patients and 22 healthy older controls, while viewing emotional video clips. Voxel-based morphometry was conducted to identify neural correlates of psychophysiological responses. Our results showed that unlike controls, patients with bvFTD did not show differential facial EMG responses according to emotional condition, whereas SD patients showed increased psychophysiological responses to both positive and neutral videos. Controls showed greater SCL when viewing positive and negative videos, however, both bvFTD and SD groups showed no change in SCL across conditions. Dampered psychophysiological response to positive films was associated with reduced right insula integrity, whereas reduced arousal was associated with lower integrity of the caudate, amygdala and temporal pole. Our results demonstrate that while bvFTD patients show an overall dampening of responses, SD patients appear to show heightened physiological responses. These results identify potential mechanisms for the abnormal social behaviour in bvFTD and SD. Future studies will assess preclinical gene carriers to determine the potential of psychophysiological measures to inform early diagnosis and tracking of progression in frontotemporal dementia.

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Theme: Care

Initiation of antipsychotic medicines in older Australians during hospital admission

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Our results showed that while bvFTD patients show an overall dampening of responses, SD patients appear to show heightened physiological responses. These results identify potential mechanisms for the abnormal social behaviour in bvFTD and SD. Future studies will assess preclinical gene carriers to determine the potential of psychophysiological measures to inform early diagnosis and tracking of progression in frontotemporal dementia.
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Theme: Assessment and Diagnosis
Indigenous Community Approaches to the Development of Assessment Tools for Cognition: An International Perspective

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The International Indigenous Dementia Research Network has been formed to address the needs of Indigenous peoples with dementia and their carers and communities worldwide. Studies have reported relatively high rates of cognitive impairment and dementia in Indigenous communities — often at younger age of onset and in association with high rates of chronic conditions such as diabetes and frailty. The Network’s primary aims are to increase the knowledge required to ensure accurate, culturally respectful approaches to detection and management of cognitive impairment and dementia in older Indigenous peoples, and to address the inequities underlying the high prevalence of dementia in Indigenous people worldwide. The collaboration includes researchers from Australia, Canada, North America, Brazil and New Zealand who work closely with Indigenous community partners and local health care providers to adapt and develop culturally appropriate assessment tools for cognitive impairment and dementia. A number of tools are in the process of being locally adapted and validated, based on the Kimberley Indigenous Cognitive Assessment Scale (KICA). These include: the Canadian Indigenous Cognitive Assessment (CICA) for use with older Anishinaabe adults in Ontario; the KICA for use with Indigenous Brazilians; and the development of a Māori-responsive assessment tool for dementia diagnosis. This presentation will describe the processes and challenges of adapting cognitive assessment tools for use in diverse Indigenous communities from an international perspective.

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Theme: Prevention
Longitudinal associations of antihypertensive agent choice and brain atrophy

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Background: The relationship between hypertension and an increased risk of dementia is well known. However, the effects of particular antihypertensive treatments on dementia risk are unknown. Data from animal models suggest angiotensin receptor blockers (ARB) may drive pathways beneficial to brain health and that angiotensin-converting enzyme inhibitor (ACEI) may drive pathways related to neurodegeneration. However, there have been few studies performed in humans and the results of these studies have varied widely. Aim: We aimed to study whether ACEI use was associated with greater decline in brain atrophy when compared to ARB use. Methods: Community-dwelling volunteers aged 65–90 years were recruited into the Cognition and Diabetes in Older Tasmanians longitudinal study. Brain MRI (total brain volume) measurements were performed at 3 time points over 4.6 years. Medication lists were manually reviewed and antihypertensive class identified. Mixed models were used to examine longitudinal associations between antihypertensive class and MRI brain measures independent of vascular risk factors. Results: There were 163 people taking ACEI (mean age 69.9 years) and 125 taking ARB (mean age 69.5 years) at baseline. There was an interaction between antihypertensive type and time (p=0.03) after adjustment for age, sex, education and vascular risk factors, such that people taking ACEI at baseline demonstrated greater decline in total brain volume than those taking ARB. Conclusions: Baseline use of ACEI was associated with greater rates of brain atrophy than those taking ARB drugs at baseline. The exact mechanisms underlying this association are unknown but warrant further investigation.
Background: This narrative review aimed to discuss why medication use in people with dementia is challenging and how to improve it. Methods: Literature searches were conducted using MEDLINE, EMBASE and the Cochrane Library of Systematic Reviews databases from conception to August 2017 with limitation to English language. Key search terms included quality use of medicines (QUM) and medication related problem in combination with dementia or Alzheimer’s. Papers describing factors affecting QUM in people with dementia were included. Results: There is limited literature reporting factors affecting QUM in people with dementia, which can be classified into those related to patients, physicians and the healthcare system. Patient-related factors included the progressive cognitive and functional deterioration and age-related changes in pharmacokinetics and pharmacodynamics; and the fact that dementia often coexists with other chronic diseases, thus being associated with multiple medications use. Physician-related factors included diagnostic and therapeutic knowledge and skills; and pressure to manage multiple patients quickly. System factors included failure to coordinate care; lack of guidelines for multimorbidity; and prescribing culture. Conclusions: The management of medication in people with dementia requires the increasing involvement of pharmacists to provide a number of cognitive services including medication reconciliation, medication review, adherence services and proactive adverse reaction monitoring. This needs to be integrated into a multidisciplinary, patient-centered, integrated and coordinated model of care to improve QUM and health outcomes for people with dementia.
Type 2 diabetes mellitus (T2DM) is associated with an increased risk of dementia. Left ventricular hypertrophy (LVH) is prevalent in T2DM and an independent predictor of cognitive impairment. In this preliminary analysis, we compared brain atrophy between healthy participants and T2DM, and those with T2DM according to the presence or not of LVH. Healthy participants without diabetes or dementia (n=37, controls) participating in the Cognition And Neocortical Volume After Stroke study were compared to 39 patients with T2DM. A 3T MRI was undertaken and FreeSurfer v6.0 was used to perform volumetric segmentation of the MR images. Differences in total brain volume (TBV), mean cortical thickness and subcortical volumes were compared. T2DM participants also had an echocardiographic assessment of LVH. Compared to controls, T2DM patients were younger (mean ± SD 63 ± 7 vs. 68 ± 6 years (p=0.003), with more obesity (BMI 31 ± 6 vs. 26 ± 4, p<0.0001) and hypertension (73 vs. 43%, p=0.013). T2DM patients had significantly more atrophy of the amygdala (p=0.016), nucleus accumbens (p=0.001) and brainstem (p=0.016). Differences remained significant after adjustment for age, education level, total intracranial volume (TIV), BMI and hypertension. T2DM patients with LVH (36%) had more atrophy in the amygdala (p=0.020) and reduced TBV (p=0.006) compared to T2DM patients without LVH. Differences in TBV were independent of sex, TIV and education level (p=0.006). T2DM contributes to accelerated structural brain aging, manifesting as cerebral atrophy. The copresence of LVH in T2DM may represent a risk factor for subsequent cognitive impairment and dementia.
This is not an abstract for presentation of conducted research. It is, rather, a plea to present the case for uptake of research into transitions towards care and support based on Human Rights (Rights based Care & Support; RBCS). People with dementia themselves have made a powerful case internationally for RBCS for themselves and others. As an advocate, educator and consultant in the field, I have developed support for it’s wholehearted adoption. This urgently requires a diversity of research approaches, grounded in participation with consumers, to develop a plurality of viable models for supporting People living with Dementia and the people who love and support them (carers). It further requires research and valorization of processes that can create transitions towards RBCS in existing situations, and lead to the transformation of care as we know it towards something that people really want. So my presentation will be a brief outline of how we got to this point, but then more questions that need to be addressed to go in this direction, rather than ready-made answers.

**Theme:** Care Rights Based Care and Support

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**Koori Growing Old Well Study Investigators**

The Koori Growing Old Well Study (KGOWS) is an epidemiological cohort study, first funded by NHMRC in 2008, arising from an observed need for better dementia and aged care in NSW Aboriginal communities. A key finding is that the prevalence of dementia is three times higher in this population compared to non-Aboriginal Australians. This study was established in close collaboration with Aboriginal Community Controlled Health Organisations, NSW Health co-investigators, and local guidance groups to understand ageing and dementia, document service access, raise awareness and build capacity. These continued partnerships have enabled evolution of research over time, in conjunction with translational projects and local service improvements. At baseline (2010–2012), 236 Aboriginal people (aged 60–92 years) from five urban/regional communities completed structured interviews and clinical assessments. At baseline (2010–2012), 236 Aboriginal people (aged 60–92 years) from five urban/regional communities completed structured interviews and clinical assessments. At baseline (2010–2012), 236 Aboriginal people (aged 60–92 years) from five urban/regional communities completed structured interviews and clinical assessments. At baseline (2010–2012), 236 Aboriginal people (aged 60–92 years) from five urban/regional communities completed structured interviews and clinical assessments. At baseline (2010–2012), 236 Aboriginal people (aged 60–92 years) from five urban/regional communities completed structured interviews and clinical assessments. At baseline (2010–2012), 236 Aboriginal people (aged 60–92 years) from five urban/regional communities completed structured interviews and clinical assessments.

Prepared for the 2011 Census, Koori Growing Old Well Study (KGOWS) participants were surveyed to plan the next phase of research, which included interviews with participants to better understand dementia and aged care. This study was established in collaboration with Aboriginal communities, NSW Health co-investigators, and local guidance groups to understand ageing and dementia, document service access, raise awareness, and build capacity. These continued partnerships have enabled evolution of research over time, in conjunction with translational projects and local service improvements. At baseline (2010–2012), 236 Aboriginal people (aged 60–92 years) from five urban/regional communities completed structured interviews and clinical assessments.

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In 2013–2014, participants (n=227) were surveyed to plan the next phase of research and 77% nominated to incorporate blood samples, genetic testing and brain scans. KGOWS-II follow-up for incidence of dementia (2016–2018) included 162 participants, most with consent to optional APOE genotyping.

To date, 21 people have also participated in an ongoing imaging sub-study. This longitudinal research provides data on a range of health, biomedical, psychosocial, and cultural factors, to increase understanding of ageing and dementia in this population. Preliminary findings suggest that 6-year cognitive decline is associated with potentially modifiable risk factors including hearing loss, obesity, and unskilled work. This aligns with the priority theme ‘Prevention’ by strengthening the evidence on primary causes and risk factors relevant to older Aboriginal people disproportionately affected by dementia.
Supported decision-making is a progressive, rights-based approach aimed at enabling a person living with disability to make and communicate decisions about their own life. Supported decision-making has emerged from the disability sector, but has only recently been explored in the context of dementia. This paper reviews a three-year research program on supported decision-making, undertaken through the Cognitive Decline Partnership Centre. This research program has examined existing legal frameworks for healthcare and lifestyle decision-making in Australia, and assessed existing policies of aged care providers, seeking to establish the degree to which these frameworks acknowledge supported decision-making. In-depth qualitative interviews with people living with dementia (N=25), their family members (N=32) and professionals involved in dementia care and support (N=31) illustrate the individual, relational, decisional and external factors that influence the use of supported decision-making. The researchers draw on these lived experiences to understand what types of support are helpful, who is best placed to provide such support, and the practical issues and safeguards that would need to be considered. An ongoing process of advisory input from three supported decision-making ‘interest groups’ (including consumer, industry and advocacy perspectives) has informed the development of practical resources (including videos, consumer guides, policy guidelines and training packages). The findings demonstrate the importance of existing informal networks in maintaining relationships and involvement in decision-making for persons with dementia, as the condition progresses. We conclude with recommendations for flexible, rights-based policies which support the maintenance of existing networks and accommodate different stages of cognitive impairment.

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**Background:** Enhancing quality of life (QoL) is a central goal of aged care services for people living with dementia and a key outcome measure for service providers and researchers. At present, there is no tool to evaluate QoL from the perspective of older Aboriginal Australians. This study aims to develop a culturally meaningful QoL tool for older Aboriginal Australians with and without cognitive impairment. Methods: The study has been conducted in Perth, Western Australia. Participatory Action Research (PAR) approaches were used for tool development to ensure active community collaboration in the research. Aboriginal Australians aged over 45 years were selected using purposive sampling. Data was collected through in-depth interviews and ranger circles. Recommendations to respond to identified needs are being developed in collaboration with participants, community Elders and service providers. Results: The draft Good Spirit Good Life tool comprises 10 items reflecting these 10 factors, with a total possible score of 30. Conclusion: Aboriginal community collaboration and engagement is essential to develop an effective measure of Aboriginal QoL. Validation is underway in Perth and Melbourne to ensure the tool is culturally meaningful and appropriately identifies the quality of life needs of older Aboriginal people with cognitive impairment.
The identification of the TAR DNA-binding protein 43 (TDP-43) as the ubiquitinated cytoplasmic inclusions in frontotemporal lobar degeneration (FTLD) and amyotrophic lateral sclerosis (ALS) confirmed that these two diseases share similar mechanisms, likely to be linked to the abnormal hyperphosphorylation, ubiquitination and cleavage of pathological TDP-43. Importantly however, a quantitative analysis of TDP-43 inclusions in predilection cortical regions of FTLD, FTLD-ALS and ALS cases has not been undertaken. The present study set out to assess this and demonstrates that distinct TDP-43 inclusion morphologies exist in the anterior cingulate cortex, but not the motor cortex of FTLD and FTLD-ALS. Specifically, in the anterior cingulate cortex of FTLD cases, significant rounded TDP-43 inclusions and rare circumferential TDP-43 inclusions were identified. In contrast, FTLD-ALS cases revealed significant circumferential TDP-43 inclusions and rare rounded TDP-43 inclusions in the anterior cingulate cortex. Distinct TDP-43 inclusion morphologies in the anterior cingulate cortex of FTLD and FTLD-ALS may be linked to heterogeneity in the ubiquitination of pathological TDP-43 inclusions, with the present study providing evidence to suggest the involvement of distinct pathomechanisms in these two overlapping clinical syndromes.

A hospitalised person with dementia may have limited capacity to communicate needs, preferences, and symptoms to clinicians, compounding risks of distress and other adverse outcomes. A mixed methods study was funded by the Dementia Collaborative Research Centre: Carers and Consumers to address this concern. Family caregivers of people with dementia, hospital staff members, and researchers collaborated to develop a caregiver-staff communication tool, the Focus on the Person form. Items were developed based upon a literature review determining key risks from hospitalisation for the person with dementia. Researchers consulted clinicians and caregivers as topic areas were mapped alongside information to be elicited from the family to inform safe person-centred care. When a draft form had been developed, 31 family caregivers of people with dementia completed and maintained it for one month, providing feedback on the experience during semi-structured interviews. Thirty hospital clinicians were provided with a summary of the information provided by caregivers using the form; they suggested refinements to ensure the accessibility of form data for planning hospital care. The Focus on the Person form is available electronically or in hard copy. It is recommended that family caregivers complete the form at home, in partnership with the person with dementia if appropriate, and keep it updated in case of unanticipated hospital admission. The completed form can then be used by clinicians as a basis for safe, collaborative, person-centred care. This presentation explains caregiver and staff perspectives elicited during the study and components of the form; it also discusses implementation strategies.

The Mediterranean diet (MedDiet) is effective at improving cardiovascular risk factors associated with dementia. Further, Mediterranean countries experience lower rates of dementia and Alzheimer’s disease when compared to Western populations like Australia. Rich in extra-virgin olive oil, nuts, fish, fruits, vegetables, legumes, and cereals, the MedDiet may be an effective dietary intervention for the prevention of dementia. However, it is currently unknown how well the MedDiet translates to countries outside the Mediterranean basin, such as Australia. Our research examines the implementation of a MedDiet in non-Mediterranean populations. We review the literature and connect findings from international studies, including three randomised controlled trials conducted by our research group in Australia. We explore sustainability, feasibility and the practical challenges of implementing the MedDiet in an Australian population, including the capacity of the diet to meet key nutrient requirements of older Australians. Our findings suggest that the MedDiet may be effective at improving markers of cardiovascular health in older Australians, which may in turn reduce risk of dementia. However, studies in non-Mediterranean populations report mixed findings on the direct effect of the diet on cognitive function. Possible explanations for these inconsistencies are explored, with reference to current methodological approaches in cognitive testing, lifestyle factors, and environmental context.
The National Rollout and Evaluation of the Dementia Care in Hospitals Program (DCHP) was completed in November 2017. The DCHP including the Cognitive Impairment Identifier (CII) was developed with patients with cognitive impairment (CI) and those who support them. Permission to use the CII was granted by consumers on the basis that the hospital using it would improve its support for patients with CI. The national partner sites were supported by Ballarat Health Services (BHS) to implement the DCHP and CII, improve hospital culture, develop appropriate hospital guidelines and policy and to become DCHP Leadership Sites for their jurisdiction. The BHS team continues to support the Sites as they bed-in and spread the DCHP and CII to other hospitals. The BHS team is also working with other jurisdictions to develop new program collaborations. Collaboration with the Leadership Sites, consumers representatives, jurisdictional bodies and other hospitals has been required to ensure that implementation of the DCHP and use of the CII is consistent with the philosophy and culture change that consumers were promised. This paper will report on the progress of each of the Leadership Sites both internally and in their jurisdiction. It will explore the challenge of disseminating a philosophy of care. The solutions have included legal protections of intellectual property, DCHP implementation and national spread.

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**Theme:** Prevention

**Association between a dietary inflammatory index and brain MR biomarkers — The Cognition and Diabetes in Older Tasmanians Study**

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Menzies Institute for Medical Research, University of Tasmania, Hobart, TAS; Monash University, Melbourne, VIC

**Background:** Inflammation has been proposed as a mechanism in the relationship between diet and poorer cognitive function. However, the underlying brain pathways are unknown. The aim of this study was to examine associations between the dietary inflammatory index (DII®) score and markers of brain volume and small vessel disease in people with and without Type 2 Diabetes (T2D). Methods: Participants were from the Cognition and Diabetes in Older Tasmanian study. The DII (a literature-derived dietary index) score was computed from responses to the Dietary Questionnaire for Cancer Council of Victoria that queried foods consumed in the past 12 months. White and grey matter volume, infarcts, microbleeds and white matter hyperintensity volume were obtained from magnetic resonance imaging (MRI). Logistic and linear regression analyses were performed to examine associations between DII scores and brain measures, adjusting for age, sex, education, energy, T2D and total intracranial volume. Results: The mean age of participants was 67.6 (SD 7.1) years for people with T2D (n=312) and 72.0 (SD 7.1) years for people without T2D (n=315). There were no associations between DII scores and grey, white or white matter hyperintensity volumes (p<0.05). There were significant interactions found between T2D and DII scores for both microbleeds (p for interaction= 0.031) and infarcts (p for interaction=0.044) such that associations with DII scores were stronger in people without T2D. Discussion: This is the first study to investigate the association between DII and MRI variables. Associations between DII and both infarcts and microbleeds, were stronger in people without T2D.
CONSUMER INVOLVEMENT IN RESEARCH PRESENTATIONS

MS ISABELLE BURKE

Isabelle is a consumer advisor with Dementia Australia and carer for her mother Christine, who has been diagnosed with younger onset dementia four years ago.

Through her advocacy work, Isabelle wants to emphasise the need for early diagnosis, and an improvement in services and care for people living with dementia. She believes passionately in the benefits of involving consumers in research.

Winner — Best Presentation by a Person with Dementia or Carer

LIVED EXPERIENCE SPEAKER BIOGRAPHIES

MS THERESA FLAVIN AND DR CRAIG SINCLAIR

Rural Clinical School of Western Australia, University of Western Australia
Craig.sinclair@rcswa.edu.au

Theme: Living with dementia

Supported Decision Making — the lived experience of consumer impact in dementia research

Interviewed by Dementia Australia CEO Maree McCabe, Theresa detailed her experience participating in a working group looking at ways to promote and implement supported decision making for persons living with dementia. This working group is part of a 3 year project funded by the Cognitive Decline Partnership Centre. Theresa addressed her motivations for becoming involved, her experiences as a consumer in this research project, and the practical strategies employed to bring her voice to the table — what worked and what could be improved. Theresa illustrated how it’s possible for people living with dementia to influence the focus and conduct of a research project, and how her lived experiences (as both a person living with dementia and a family member of someone with dementia) have been able to inform the project.

MR IAN GLADSTONE

Ian Gladstone was diagnosed with Semantic dementia at age 58, following a stroke-like episode.

Following his diagnosis, Ian became involved with Alzheimer’s South Australia with his sister and care partner, Anne. Ian undertook a number of training sessions and became involved in various activities which involved meeting other persons with Younger Onset Dementia.

Recognising his condition relative to his peers, Ian began advocating on behalf of people with dementia. Through his work Alzheimer’s SA, Ian met fellow advocate Kate Swaffer and began sharing his story of living well with dementia throughout his community. After filling in for a speaking engagement on Kate’s behalf, Ian was introduced to the national and international world of dementia advocacy. Ian is dedicated to spreading the message that dementia doesn’t have to be such a sad experience. In particular, he advocates the power of humour in living with dementia and tries to bring a smile to the faces of his friends living with dementia. It is Ian’s intention to continue to support those in genuine need, who deserve the encouragement to live a good life, despite their dementia.

Winner — Best Presentation by a Person with Dementia or Carer
**DR RON SINCLAIR**

Ron was a carer for his wife who passed away in 2006 from familial Younger Onset Alzheimer’s disease.

Dr Sinclair’s father succumbed to dementia in 2004, and he now cares for his stepmother who has recently entered residential care with dementia. Dr Sinclair was a member of the Carers Advisory and Advocacy Committee and a Board member of Alzheimer’s Australia South Australia for 10 years. He is now a consumer representative on Alzheimer’s Australia’s National Carers Advisory Committee, the National Cross Cultural Dementia Network, the Minister’s Dementia Advisory Group and Chair of the Consumer Dementia Research Network. Dr Sinclair is a research biologist with the South Australian Government and conducts epidemiological studies on myxomatosis and rabbit haemorrhagic disease in wild rabbits.

**MS ELAINE TODD**

Elaine first joined Alzheimer’s Australia after noticing a change in her mother’s behaviour.

Interested to learn more, she utilised the library and attended a number of carer education courses. These courses helped Elaine identify and assist in seeking a diagnosis for her mother in 1998. Elaine became very active with Alzheimer’s Australia NSW as an inaugural member of the NSW Consumer Reference Group and the CDRN following its establishment in 2010. Elaine supports and advises family members of those with dementia, and helps transports them to education days and support group meetings. Elaine gets a great deal of satisfaction from being involved in the research side of dementia and looks forward to seeing collaborative projects put into best practice.

**MR JOHN QUINN AND MS GLENYS PETRIE**

John is a person living with dementia, believed to be of the Familial Type.

He was diagnosed in his late 50s. With support from his partner Glenys Petrie, John is living well with dementia, and presenting nationally and internationally, on a range of issues about dementia. They are both on 4 different CDPC committees and approximately 6 other research committees, national and local committees about health issues or inclusive communities.

**MS DANIJELA HLIS**

Danijela has been an activist and consumer advocate for people living with dementia and their carers for more than eight years and stresses the importance of the environment.

As a long term member of Consumer Dementia Research Network (CDRN) and CDPC Consumer Representative, Danijela has participated in a number of CDPC Project teams, been on a variety of executive and steering committees, presented at conferences and given workshops to staff in residential care facilities while living in Tasmania.


She is passionate about raising awareness about the need for inclusion for all, in all matters relating to living with dementia.

Now retired, she is a volunteer with COTA — (COTA Ambassador Qld), and a ComLink bi-cultural social support worker for clients from Italian, French, Slovenian and German background who have dementia.

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Our preliminary findings suggest that the MMM program showed a significant increase in attention scores after the MMM program. There was a significant difference in ACE scores between Group 1 and Group 2 acting as a wait list control. The Addenbrooke’s Cognitive Examination (ACE) was completed at baseline, Time 1 (7 weeks) and Time 2 (post treatment Group 2). Results: 5 participants in Group 1 (5 drop outs from illness) and 7 participants in Group 2 (1 deceased, 2 withdrew) completed assessments. A significant difference in ACE scores was found from baseline to Time 1 (p = 0.045) between Group 1 and 2 (waitlist control). Differences were present in ACE sub-scores (p = 0.004) and verbal fluency (p = 0.01). Group 2 showed cognitive decline during the wait list period (significant drop in ACE score, p = 0.038). Both groups exhibited stable cognition (no change in ACE scores) after the MMM program. There was a significant increase in attention scores after the MMM program in Group 1 and 2 (p = 0.041 and p=0.049, respectively). Conclusion: Our preliminary findings suggest that the MMM program can stabilise cognition and improve attention in PWD.

Brain Training: a question of more than just efficacy
Nicole A. Ee, Kaarin J. Anstey
Centre for Research on Ageing, Health and Wellbeing, The Australian National University

Background: Excessive worrying about cognition and fears of dementia are not uncommon features of later life. The concern or experience of declining cognitive abilities can often lead to distress, anxiety and depression among older adults. While some seek professional help to aid with coping, many others remain undiagnosed and untreated. Little is known about whether such individuals engage in self-help behaviors to alleviate their distress surrounding cognitive decline. This study sought to examine impact of psychological distress on brain training. Methods: A nationally representative sample of 800 English speaking Australians (69% males) was recruited through random digit dialing. Participants were highly educated with more than 65% having attained secondary or higher qualification. A standardised telephone survey was administered to each participant, including questions about demographics, status of engagement in brain training, worries about cognition, fears of Alzheimer’s disease (AD) and depression. Results: A small majority (68%) of participants were actively engaged in brain training during study. They had a mean age of 51.34 (SD = 15.64) with more than 75% having been engaged for a 6-month period or longer. A logistic regression was performed to ascertain the effects of worry about cognition, fear of AD and depression on brain training. While the logistic regression model was not significant, 2 (β = 3.66, p = 0.89), there were trends towards associations between frequent worrying about cognition (at least once a week) and active engagement with brain training, OR = 2.01, 95% CI[1.00, 4.01], p > .05. The frequent worriers were age 55.49 (SD = 16.84). Conclusion: These results suggest that distress related to cognitive decline is not a strong driver of self-improvement behaviors in older adults. Given there are trends that worriers are more likely to work their brain, dispositional factors and personality may be possible determinants of brain training.

The APoE gene allele has been identified as a major genetic risk factor for late-onset Alzheimer’s Disease (AD) that appears to be associated with defective clearance of beta amyloid (Aβ) in the brain. The APoE4 allele represents an increased risk of developing AD, whilst the APoE2 allele is protective compared to the most common APoE3 allele. However, the exact mechanisms of action of APOE in AD are still not fully understood. The APoE3 and APoE4 isoform differ only in one single nucleotide polymorphism (SNP), located in the fourth exon of the APOE gene that affects an amino acid at the amino terminus (a key feature of iPSCs), as demonstrated by immunostaining. iPSCs have been extensively characterised and demonstrate terminal differentiation, as demonstrated by their ability to differentiate into the three germ layers (a key determinant of brain development). The APOE gene allele has been identified as a major determinant of brain development. The APOE3 and APOE4 isoform differ only in one single SNP, located in the fourth exon of the APOE gene that affects an amino acid at the amino terminus (a key feature of iPSCs), as demonstrated by immunostaining. iPSCs have been extensively characterised and demonstrate terminal differentiation, as demonstrated by their ability to differentiate into the three germ layers (a key feature of iPSCs), as demonstrated by immunostaining. Together, these lines will provide a novel tool for the study of AD in vitro.
Dementia is often associated with multiple co-morbidities necessitating the use of numerous medications, which increase risks of adverse reactions, drug-drug interactions and exacerbation of cognitive impairment. Indigenous Australians may be at increased risk due to their higher prevalence of chronic conditions. This study examined the anticholinergic burden among a cohort of elderly Aboriginal people and its associations with several health outcomes. Urban and regional community dwelling Aboriginal people aged over 60 years (n=238) completed an interview that covered life background, social, demographic, health and wellbeing, cognitive status and medication use. Anticholinergic burden was calculated using anticholinergic burden (ACB) and anticholinergic drug (ADS) scales, updated by an expert panel. Approximately 40% of participants were taking 5 or more medications, and 47% were taking at least one anticholinergic medication. After adjusting for sex, education and living circumstances, anticholinergic medication use was associated with dementia or mild cognitive impairment (OR 1.7; 95% CI 1.0-3.0; p=0.04), hospitalisation in the past year (OR 1.7; 95% CI 1.0-2.9; p=0.04), and being dependent on assistance with daily living (OR 2.53; 95% CI 1.58-4.06). Health outcomes for Aboriginal people with dementia may benefit from reduction in use of anticholinergic medicines.

Schizophrenia is a debilitating mental illness that disrupts the functioning of the human mind, with onset typically occurring in young adulthood. An overwhelming body of evidence from multiple studies has linked hyperactive dopaminergic neurotransmission to the psychotic symptoms of schizophrenia. These symptoms are associated with excessive dopaminergic neuronal firing, primarily within the midbrain, accompanied by increased dopamine synthesis and release, and increased activation of dopamine D2 receptors in limbic structures (Schwartz et al., Front Pharmacol 2012). In clinical research dopamine levels are usually tested using the well-established enzyme-linked immunosorbent assay (ELISA). However, this assay costs around $1000 per assay plate. This is a significant barrier for a selective and non-invasive detection of dopamine levels in biological samples from schizophrenia patients and in vitro and in vivo models of this mental disorder. We utilise an emerging field of upconversion nanoparticles for optical imaging [Zhou et al., Nature Nanotech. 2015]. That results in higher signal-to-noise, sensitivity and biocompatibility, photostability, and the ability to absorb control of shape, light-emitting rare earth ion doping, with high doping of lanthanides that can indicate output with high doping of lanthanides that can indicate output through fluorescent signal. These particles offer precise control of shape, light-emitting rare earth ion doping, biocompatibility, photostability, and the ability to absorb light in the near-infrared area and emit it in the visible range. This nanosensor provides a new tool to evaluate changes in dopamine levels in biological samples from schizophrenia patients and schizophrenia experimental models.

Autosomal dominant Alzheimer disease (ADAD) is due to specific genetic mutations that have near 100% penetrance. While some members of families with ADAD mutations choose to learn their mutation status, many do not. The extent to which knowing one’s mutation status might affect clinical disease progression is currently unknown. The aim of this study was to quantify the influence of mutation awareness on rates of clinical and cognitive decline. Mutation carriers and noncarriers from the Dominantly Inherited Alzheimer Network (DIAN) were stratified based on knowledge of mutation status. Groups were statistically matched on estimated years to symptom onset using propensity scores. Rates of change on standard clinical, cognitive and neuroimaging outcomes were examined. Mutation carriers aware of their status scored worse on CDR Sum of Boxes (CDR-SB) and a cognitive composite score at baseline. They also showed accelerated change on CDR-SB but similar cognitive trajectories as carriers without knowledge of mutation. No differences were observed on baseline levels or rates of change in amyloid. Having knowledge of mutation in carriers is associated with baseline differences in clinical and cognitive measures and with increases in rate of clinical decline. However, rates of change on objective cognitive measures are unaffected. The cause of differences at baseline may be because participants seek genetic testing when symptoms are worsening or knowledge of mutation may alter the behavioral presentation of ADAD. Either way, mutation knowledge does not appear to impact quantitative assessments of disease progression. Future analysis to account for causal effects will be explored.
Previous studies of AD brain shows a marked up-regulation of lysosomal activity, including extensive involvement of various acid hydrodases such as cathepsins B and D with Aβ protein deposits. In addition, the AD brain also shows abnormal activation of nutrient sensing kinase AMPK-activated protein kinase (AMPK), which is an important regulator of autophagy. AMPK is a heterotrimeric protein complex composed of α, β, and γ subunits including a noncatalytic regulatory γ subunit PRKAG2. Recent findings show that PRKAG2 has an important role in regulating autophagy and degradation of prion aggregates in MC65 cells producing Aβ. Recent studies show that IU1 is a selective inhibitor of deubiquitinating enzyme USP14 inhibits Aβ toxicity in neuronal cells.

In this study, we used the MC65 cell line to model Aβ accumulation and toxicity. MC65 is a well-established human CNS derived cell line that generates Aβ by ß-secretase cleavage from the amyloid precursor protein (APP). Using this cell line as a platform, we screened an intervention and treatment panel of compounds showing a marked 40% increase in cell survival with omeprazole and IU1, a selective inhibitor of deubiquitinating enzyme USP14. Overall, IU1 was identified as the most potent compound showing a marked 40% increase in cell survival in MC65 cells producing Aβ. Recent studies show that IU1 regulates autophagy and degradation of prion aggregates in cells. This suggests that its protective effect in MC65 cells is possibly through the upregulation of Aβ protein clearance. Our findings demonstrate a novel role for IU1 in reducing Aβ induced toxicity. Further investigation of its protective effects will be essential in determining its therapeutic potential in AD.
Randomised to an exercise intervention undertook six months exercise or control group (n=33 in each group). Individuals were matched for age, APOE4, and lower Aβ were independently associated with higher tau levels. Longitudinally, fenosticoine APOE4 carriers with lower baseline A showed greater rates of total-tau accumulation in comparison with all other CN (male-APOE4+, p=0.05; female-APOE4+, p=0.003).

Conclusion: Total-tau accumulation was apparent in CN female APOE4 carriers with abnormal levels of CSF Aβ at baseline. No sex-APOE differences existed in baseline levels in CN. Mounting evidence implicates female-APOE4 vulnerability to tau in MCI at the cross-section, however, our findings suggest an early emergence of sex-APOE differences in preclinical AD.
Aims: The aims of this study were to: 1) determine if older people with cognitive impairment are able to reach the speed required at pedestrian crossings (>1.2 m/s) and 2) people with cognitive impairment are able to reach the 1.2 m/s. Fifty percent of women with mild dementia, and greater cognitive impairment was associated with slower PWS (β −0.08, −0.07, −0.03). Conclusion: In older people, greater levels of cognitive impairment were associated with reduced speed and walk quickly. Such limitations of cognitive impairment were associated with reduced ability to increase speed and walk quickly. Introduction: Analysis of hospitalisation over time for people with dementia may enhance understandings of the disease trajectory and highlight opportunities for earlier recognition. This study described patterns of hospitalisation in the five years prior to index, and the index (i.e., first) admission for dementia. Methods: A longitudinal linked admitted patient and emergency department (ED) dataset was used to identify index dementia admissions, and examine patterns of utilisation in a regional local health district in NSW Australia. This data was available because of a collaborative research partnership between the Illawarra Shoalhaven Local Health District and the University of Wollongong. Results: 7,920 persons with dementia were identified with 34,635 admissions and 27,323 ED presentations. An increasing frequency of hospitalisation was observed, particularly in the year prior to index, where a 15.8% and 13.6% rise per person occurred in ED visits and admissions respectively. Main reasons for admission at index and prior were for nervous system (25% and 10.9%), musculoskeletal system (13.7% and 11.6%), and circulatory system (11.1% and 17.9%) illnesses. Main reasons for ED visits were for respiratory system (18.4%), circulatory system (16.5%), and neurological system (12.0%) illnesses. There was a steep increase in visits for falls and urinary tract infections in the year prior to index, with these conditions accounting for 39.5% of all visits. Conclusion: This study addresses a gap in evidence regarding hospital utilisation in the years leading up to an index dementia admission. Findings can be used to inform strategies to improve dementia identification in the hospital system.
Getting outside: an under-utilised tool for reducing BPSD for people with dementia in residential care?

Sabrina Chao, Meredith Gresham, Colm Cunningham, Marie Alford
The Dementia Centre, HammondCare

There is a growing body of evidence and clinical opinion that getting outdoors is critical for wellbeing and quality of life for people living with dementia in residential aged care. Being outdoors has been associated with beneficial light exposure to help normalise circadian rhythms, improving Vitamin D levels through sunlight on skin, providing opportunities for incidental exercise, managing mood and behavioural and psychological symptoms of dementia (BPSD), as well as the resident deriving pleasure from familiar activities in the garden, such as gardening, picking flowers or hanging washing on the line. However, with increasing population densities in Australian metropolitan areas, there has been an increase in building to open space ratios and an increase in multi storey aged care homes, limiting the potential of outdoor space to be used as a therapeutic tool. Over the last 9 months, it was indicated that lack of access to outdoor spaces was a contributing factor in BPSD of 299 clients referred to Dementia Support Australia (DSA), a national behaviour management advisory service. While spending time outdoors is considered beneficial, little is understood about what the barriers and enablers are to getting residents outdoors in busy aged care homes, especially for residents who have poor mobility or are immobile. This poster will present interim results from a qualitative study using in-depth interviews with staff from ten Australian aged care homes to identify key aspects that limit or enhance residents experience of outdoor spaces.

Managing expectations in the age of choice. Will consumer directed care deliver?

Tracy Comans, Len Gray, Kim Nguyen
Centre for Health Services Research, University of Queensland, Brisbane, QLD, Australia

Megan Corliss
Helping Hand Aged Care, Adelaide, SA, Australia

Tara Quirke
Dementia Australia

The goal of consumer directed care (CDC) is to promote better health outcomes by allowing individuals to have purchasing control over their care packages. By way of the invisible hand of the market, CDC should improve efficiency and create pressure on care providers to improve the quality of their services. CDC fundamentally shifts the nature of relationships within the care triad (care recipient, family carer and formal care staff) in which market information and knowledge, mutual trust, and collaboration affect the demand and supply of community care services. This is particularly relevant in dementia care where the decision making power gradually transfers to the family carer as the cognitive impairment of the care recipient changes. Questions arise that require further consideration. For example, does CDC change the type of care provided? What is the cost for the provider? How is information provided in a basic or comprehensive way? Is this discrimination in information delivery? Is the information provided to consumers? How is information about care choices provided to consumers? Is there any discrimination in information delivery? Is the information provided in a basic or comprehensive way? Is this information available to be used effectively in the decision making process by the dementia dyad? Our panel consists of an industry provider, consumer representative, geriatrician, and a health economist. We will discuss how collaboration, open dialogue, knowledge exchange, balance of decision-making power, agreement of goals and incorporation of transparency and accountability mechanism, between people with dementia, family carer and formal care provider, could improve the processes applied and thereby actually realise the potential benefits of CDC.

Improving knowledge and awareness of dementia is a primary focus of dementia strategies that aim to support those with the condition to live well within communities. In order to inform future education needs, in this study participants from different regions of Tasmania came together via focus groups to explore how they had acquired their existing dementia knowledge and their preferred ways of learning more about dementia. A total of 32 participants with a mean age of 62 years attended one of six groups; although male/female balance differed within the six groups, overall the gender split was even. Thematic analysis of transcribed data revealed personal and professional experience as the primary source of existing dementia knowledge. Popular media such as radio, television, Google, and other forms of online learning were also identified as sources. A wide range of dementia education needs was expressed as important, with particular focus on knowledge that enables effective engagement and communication with families and the person experiencing dementia. Consistent with their initial sources of knowledge, participants preferred future information to be accessible, interactive, practical and relationship-focused, with less emphasis on ‘expert’-driven education models. Health providers, in particular the general practitioner, were recognised as important information providers, but participants noted that both access to them and the extent of their dementia knowledge could impact on trust and usefulness. Implications for contemporary dementia education responsive to community need are discussed.

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MRS AMANDA CROSS
Monash University
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Theme: Intervention and Treatment
Deprescribing Potentially Inappropriate Medications in Memory clinic patients (DePIMM) — preliminary results of a feasibility study

Amanda J Cross, Johnson George
Centre for Medicine Use and Safety, Faculty of Pharmacy and Pharmaceutical Sciences, Monash University, Parkville, VIC, Australia

Michael Woodward
Medical and Cognitive Research Unit, Austin Health, Heidelberg, VIC, Australia

Rohan A Elliott
Centre for Medicine Use and Safety, Faculty of Pharmacy and Pharmaceutical Sciences, Monash University, Parkville, VIC, Australia; Pharmacy Department, Austin Health, Heidelberg, VIC, Australia

To inform dementia research it is imperative to know the beginning-to-end journey as told by people who are living with dementia and their caregivers. We engaged with 24 people across 3 states of Australia and asked them to voice their opinions on opportunities for improvement to current models of care. This resulted in an aggregated ‘ideal state’ dementia journey model created and endorsed by consumers.

At first participants were unsure of what they could expect participating in this research. Following explanation and examples of the patient journey modelling approach, there was significant interest in seeing the picture of their dementia journey, illustrating the pain-points. Using their own voices to drive this visual story-telling approach to gathering data, quickly opened communication lines and built trust between them and the researchers. The researchers understood that story-telling was an emotional experience, which required advanced facilitation skills. We included plenty of workshop intermissions to allow participants to steady their emotions.

Comments from participants strongly supported the visual dementia journey approach: “it was the first time our voices were respected and heard”. The production of personal lines and built trust between them and the researchers. 

Participants will receive a comprehensive pharmacist medication review in their own home in addition to standard memory clinic services. The intervention pharmacist will obtain a complete medication history and pharmaceutical and community pharmacist, as appropriate, to determine if medications can be ceased and to help plan withdrawal. Participants will be followed up at three and six months.

There is a high prevalence of medication related problems and inappropriate medication use in people attending memory clinics. Pharmacists are not typically involved in the multidisciplinary memory clinic team and there has been no deprescribing intervention studies in this setting.

This study will explore the feasibility of a patient-centred, pharmacist-led, multidisciplinary deprescribing intervention in an Australian memory clinic. The study will involve a single group (pre-comparison and post-comparison) design and will investigate feasibility of recruitment, suitability of outcome measures, health professional engagement and acceptability of study procedures.

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Surveys, focus groups and one-on-one interviews will be used to assess health professional feedback on the intervention.

Results of this study may be used to design a larger, multi-centre randomised controlled trial. If feasible and effective, this intervention could be implemented in memory clinics across Australia and has the potential to improve medication use and health related quality of life for thousands of people living with cognitive impairment.

MS ASHLEY CULLY
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Theme: Living with dementia
Putting consumers in the driver’s seat: an exploration of the dementia journey using the consumer voice

Anneke Fitzgerald
Griffith University, Gold Coast, Queensland, Australia

Joanne Curry
Griffith University, Gold Coast, Queensland, Australia; DXC Technology, Sydney, NSW, Australia

John Quinn, Glensys Petrie
Consumers, Brisbane, Queensland, Australia

Amanda J Cross, Johnson George
Centre for Medicine Use and Safety, Faculty of Pharmacy and Pharmaceutical Sciences, Monash University, Parkville, VIC, Australia

Rohan A Elliott
Centre for Medicine Use and Safety, Faculty of Pharmacy and Pharmaceutical Sciences, Monash University, Parkville, VIC, Australia; Pharmacy Department, Austin Health, Heidelberg, VIC, Australia

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Comments from participants strongly supported the visual dementia journey approach: “it was the first time our voices were respected and heard”. The production of personal lines and built trust between them and the researchers. 

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There is a high prevalence of medication related problems and inappropriate medication use in people attending memory clinics. Pharmacists are not typically involved in the multidisciplinary memory clinic team and there has been no deprescribing intervention studies in this setting.

This study will explore the feasibility of a patient-centred, pharmacist-led, multidisciplinary deprescribing intervention in an Australian memory clinic. The study will involve a single group (pre-comparison and post-comparison) design and will investigate feasibility of recruitment, suitability of outcome measures, health professional engagement and acceptability of study procedures.

Participants will receive a comprehensive pharmacist medication review in their own home in addition to standard memory clinic services. The intervention pharmacist will obtain a complete medication history and pharmaceutical and community pharmacist, as appropriate, to determine if medications can be ceased and to help plan withdrawal. Participants will be followed up at three and six months.

Surveys, focus groups and one-on-one interviews will be used to assess health professional feedback on the intervention.

Results of this study may be used to design a larger, multi-centre randomised controlled trial. If feasible and effective, this intervention could be implemented in memory clinics across Australia and has the potential to improve medication use and health related quality of life for thousands of people living with cognitive impairment.

PROF ANNETTE DOBSON
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Theme: Care
Use of health and aged care service in their last two years of life by women with dementia

There were 12,432 participants in the Australian Longitudinal Study on Women’s Health (ALSWH) who were born in 1921–26. They were a nationally representative sample selected from the Medicare database in 1995 and have been followed up with regular surveys since then. Through collaboration with data custodians and data linkage authorities throughout Australia, record linkage was used to identify all women who had any record of dementia. The data sources were hospital admissions, Medical Benefits Schedule, Pharmaceutical Benefits Scheme, Aged Care services, death certificates and ALSWH surveys (including proxy respondents). We compared the use of services in the last two years of life for women with dementia who died index cases, with two age-matched groups of women, with or without dementia, who did not die for at least two years after the index case died.

During 1996-2014, 28% of women (n=3,482) had a record of dementia. In the last two years of life, 82% of the index cases used permanent residential aged care, compared with 56% of women with dementia who did not die, and 6% of women without dementia. Permanent residential aged care use increased steadily over time, and use of other aged care and support services declined, especially near death. Admissions to hospitals and visits to general practitioners increased steeply in the last 3–4 months before death for the index cases but remained steady for women in both control groups.

The greatest impact of dementia in the last two years of life is on permanent aged care.
Scan interpretation as well as inter-reader reliability reports alongside visual Aβ image inspection improved threshold of 25.5CL was also identified for CapAIBL® from low Aβ burden. On a different cohort and compared used on 18F-florbetaben scan to reliably distinguish high threshold band of 21±7 CL was then derived and can be 91% accuracy against histopathological scores. A Centiloid (radioactive tracers, cameras, scan reconstructions, ...) groups provided us with a large variety of PET scans surface maps while providing a comparison with a normal display the semi-quantitative PET signal on brain cortical of an automated biomarker reporting tool designed to performed manually by a trained expert.

PET imaging allows the detection of the pathology of Alzheimer’s disease decades before the onset of clinical symptoms and provides invaluable insight into the development of the disease. Amyloid and tau PET scanning is thus in use as a research tool for most of the dementia research studies. Unfortunately, due to the poor anatomical information provided by a PET scan, visual reading and cortical quantification are difficult tasks that must be performed manually by a trained expert.

To address this, our collaboration between CSIRO and Austin Health yield to the successfully development of an automated biomarker reporting tool designed to display the semi-quantitative PET signal on brain cortical surface maps while providing a comparison with a normal elderly population. Our collaboration with other research groups provided us with a large variety of PET scans (radioactive tracers, cameras, scan reconstructions, ...) to robustly test our software. In our recent validation, CapAIBL® had 90% sensitivity, 92% specificity, 91% accuracy against histopathological scores. A Centiloid threshold band of 21±7 CL was then derived and can be used on 18F-florbetaben scan to reliably distinguish high from low Aβ burden. On a different cohort and compared with expert visual reads, a similar optimal Centiloid threshold of 25.5CL was also identified for CapAIBL® (sensitivity:1.00, specificity:0.95, accuracy:0.98, AUC:0.99).

We finally showed that the addition of CapAIBL® reports alongside visual Aβ image inspection improved scan interpretation as well as inter-reader reliability among non-expert readers.

**Background:** Accumulating evidence has shown sleep spindles increase during sleep following new learning, and are correlated with improved memory. Sleep spindles significantly decrease with ageing and, in Alzheimer’s disease sleep spindle deficits are related to episodic memory impairment. Promising research has identified how selective manipulation of sleep spindles through GABA agonists improves memory in healthy adults and in schizophrenia. No studies have examined this therapeutic approach in mild cognitive impairment (MCI).

**Objectives:** This proof of concept study will deliver an early pharmacological intervention to enhance sleep spindle EEG features to optimise sleep quality and improve memory in MCI.

**Methods:** This randomised, double-blind, cross-over design study will recruit 24 older adults (65–75 years) with MCI and 12 age-matched controls. Participants will be administered a short-acting, non-benzodiazepine zolpidem (15mg dose), which acts on GABA neurons in the thalamic reticular nucleus where spindles are generated, and a placebo immediately prior to napping in a randomised order. Participants’ sleep will be monitored in a daytime nap using high-density EEG following an MRI to assess markers of brain degeneration. Changes in spindle density will be correlated with memory performance post-nap relative to pre-nap.

**Significance:** This multi-disciplinary collaborative project has the potential for discovering novel ways of enhancing memory in MCI by manipulating sleep features. Sleep disturbance is a significant and prognostic feature of MCI and is a potentially modifiable risk factor. Research examining the neuroprotective role of sleep is of major importance to Australian health and offers new therapeutic targets for early disease prevention.

**Background:** Estrogen is neuroprotective, its decline at menopause may increase the risk of women developing dementia. A mediator of estrogen’s beneficial effect is brain-derived neurotrophic factor (BDNF), a neurotrophin significantly reduced in patients. Both BDNF and estrogen affect the growth, development and function of parvalbumin (PV)-expressing interneurons, which is vital in mediating cognitive functioning. BDNF loss has been found in the brains of dementia patients, particularly in the hippocampus. However, whether estrogen and BDNF operate on PV independently or in synergy in relation to cognition is unclear. To examine this, we used a transgenic mouse model (PV-cre/TkB-fl) where the BDNF receptor TrkB is knocked out of ~50% of PV neurons via the cre-lox system and submitted mice to a battery of behavioural paradigms in adulthood. Both wild-type and PV-cre/TkB-fl mice of both sexes exhibited similar baseline locomotor activity and anxiety levels. Cognitive, in the Y-maze, a test of hippocampal-dependent short-term working memory, disruption of BDNF signaling in PV cells caused a memory deficit in male mice but not female mice. The Cheeseboard maze measures spatiotopic reference memory, and male PV-cre/TkB-fl mice exhibited treatment differences in cognitive flexibility/search strategy compared to wild-type mice. Our novel model shows a subtle cognitive phenotype with a male bias — suggestive of estrogen compensation in female mice. The model invites further examination of PV neuron function in conjunction with sex differences and estrogen regulation in female mice.
Background: The need for interventions to improve quality of life, manage oral disease and prevent cognitive decline in the ageing population are clear. Physical inactivity and cardiometabolic disease are established risk factors for dementia, and emerging evidence suggests poor oral health may also be linked to cognitive decline. Oral health status is often poor in the ageing population, especially in older adults who live within aged care facilities. In addition, new evidence suggests that the benefits of exercise in previously sedentary individuals may be attenuated in older adults who live within aged care facilities. In addition, people with intellectual disability (ID) are living longer than previously and may be at increased risk of developing dementia. The impact on carers’ mental health of age-related problems such as dementia in a loved one with ID is not well understood. This is important as family carers may face additional challenges relating to both their own health and that of the person with ID for whom they care. The current study explored the carer and care-recipient factors associated with mental health in a group of 72 family carers of people with ID aged 40+. Questionnaire data was collected as part of a larger study, which also included telephone interviews and in-person assessments for a subsample with ID. Dementia status of participants with ID was determined through case consensus using all available data. Multiple linear regression examined predictors of caregiver psychological distress (as measured by the GHQ-28), including demographic factors relating to the person with ID and those relating to carers, carers’ subjective experience of burden (Zarit Burden Interview) and social supports (SSQS6). The relationship between the dementia status in the person with ID and carer distress was moderated by carers’ satisfaction with their social supports. Other significant predictors of distress included poorer carer physical health, caring for another person, and carers’ appraisal of burden. These findings highlight the potential benefits of multifaceted interventions for family carers of people with both ID and dementia. This would best be achieved with cross sector cooperation between aged care, health, and disability services.

Aim: To assess the effect of a 12-week combined psychoeducation, exercise and oral health program (‘Think Dental, Be Active!’) on quality of life, wellbeing and markers of inflammation/oxidative stress in older adults. Methods: This study is a pilot randomised controlled trial. Overall, 120 participants aged >50 years will be recruited across four Royal Freemason Benevolent Institute Aged Care Facility sites. All participants will undergo medical, neuropsychological and physical assessments as well as an assessment of oral health status. Participants will be randomised to A) a group-based exercise and psychoeducation program with waitlist dental intervention, or B) workbook exercise and psychoeducation program with immediate dental intervention, or C) BI workbook exercise and psychoeducation program with waitlist dental intervention. Follow-up assessments will be completed immediately (Week 13) and 12-weeks post-intervention (Week 27). Results: Recruitment will commence in June 2018. Conclusion: This innovative program represents a new collaboration between dentistry, medicine, psychology and health sciences with the view to develop a holistic health promotion program that can be implemented in aged care facilities throughout Australia.

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Theme: Care
Improving the Day Respite Centre Experience for People with Dementia: the Opinions of Centre Managers

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The Australian government, partly to enable people with dementia to stay living in the community longer, subsidises day respite centre (DRC) attendance. An earlier phase of this DCRC funded project found that many Australian DRCs provide good quality services to people with dementia and their carers, but there is room for improvement. To elicit suggestions for improving the experience of attendees with dementia, in this phase, in-depth face-to-face interviews (range= 25-100 minutes, median length= 39 minutes) were conducted with managers at seven DRCs in two states. The dementia-friendliness of each setting was assessed using the Environmental Audit Tool (EAT). Thematic analysis of interview responses revealed three principal themes:

• Importance of relationships between clients, family carers, staff, volunteers and the community—e.g. vital to communicate with client/carers about their needs and experiences. Staff and volunteers need dementia-specific training to improve communication and relationships.

• Constraints for services in offering ideal support to people with dementia—primarily financial, environmental and the inability to cater for all potential clients (e.g. those with high care needs).

• Future concerns—focused on funding (e.g. moving to the user pay system) and inability to provide activities desired by the incoming baby boomer generation.

Although EAT scores were moderately high overall (indicating dementia friendliness), the audit revealed some concerns in specific areas and facilities, e.g. lack of comfortable or age-appropriate furniture, unsuitable decor. Centres that were not purpose-built as day centres struggled most with environmental issues, with managers indicating that solutions would require considerable monetary investment or relocation.

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Theme: Assessment and Diagnosis
Analysis of genetic variation and pathology of CHCHD10 in cases of Australian amyotrophic lateral sclerosis and frontotemporal dementia.

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Amyotrophic lateral sclerosis (ALS) and frontotemporal dementia (FTD) are believed to belong to a common disease spectrum. Our research seeks to better understand the shared clinical, pathological and genetic features characterising ALS and FTD, to shed light on their pathogenesis. Approximately 20% of ALS patients exhibit co-morbid FTD, and up to 50% of patients will develop some degree of cognitive impairment. To date, the only proven causes of ALS and FTD are gene mutations. Recently, variants in CHCHD10 have been identified as a cause of, or associated with, pure ALS, FTD and ALS-FTD in families and sporadic patients of European ancestry. We sought to uncover the prevalence of CHCHD10 mutations among 81 Australian familial ALS (FALS) patients negative for known ALS gene mutations, 628 sporadic ALS (SALS) and 108 FTD patients. We also examined whether any common polymorphisms showed association with disease. No pathogenic or associated variants have been identified among FALS or FTD patients. Two known CHCHD10 variants (p.P94S and p.P98L) were identified in six and two SALS patients respectively. Additionally, the p.P80L variant was found to be significantly more common in the SALS cohort compared to controls. Preliminary immunopathological analysis of CHCHD10 in ALS patient spinal cord tissue has identified a potential decrease in CHCHD10 levels compared to control, while analysis of FTD patient tissue is underway. Our preliminary findings suggest that CHCHD10 mutations are not a common cause of ALS or FTD in Australian patients of predominately European ancestry. However, pathological changes in CHCHD10 suggest a role in these neurodegenerative diseases.

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Theme: Assessment and Diagnosis
Prevalence of cortical ageing-related tau astrogliopathy (ARTAG) in a European community-based ageing cohort

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Ageing-related tau astrogliopathy (ARTAG) describes a spectrum of glial tau-immunopositive pathologies commonly found in the ageing human brain and in a variety of neurodegenerative disorders. Based on the morphology and distribution of astrocytic inclusions ARTAG can be differentiated from other tauopathies, including frontotemporal lobar degeneration with tau-immunopositive inclusions (FTLD-tau) and chronic traumatic encephalopathy, but may also co-exist and have overlapping cortical distributions. Characterised by granular fuzzy and/or thorn-shaped astrocytes, a number of ARTAG types are recognised: grey and white matter-type, subpial, perivascular and sub-ependymal.

A recent study proposes that these astrocytic inclusions might represent the earliest stages of astrocytic tau accumulation in FTLD-tau. While ARTAG has been described in cognitively normal individuals, little is known about its prevalence in the general community. This study investigated the prevalence, distribution and type of cortical ARTAG in a large European community-dwelling population collected from the Vienna Longitudinal Aging Study (n=310; 76-91 years; 181 female). Sections from the frontal, parietal and temporal cortices were immunostained with phosphorylated-tau and screened for ARTAG. Cortical ARTAG was present in 38% of cases and is associated with age at death, Braak neurofibrillary tangle and CERAD stage (p<0.01). ARTAG was not influenced by gender. Although a similar prevalence of ARTAG was found in all three regions, unique regional patterns of ARTAG were identified with grey matter-type the most common. Importantly, grey matter-type ARTAG exclusively in the sulcal depths was rare. This study illustrates that ARTAG is common in the general population, providing important insights into brain ageing and FTLD-tau.
Mirror Neuron and Motor Activity in Dementia

The mirror neuron (MN) system functions as a coupling link of perception representations and action in cognitive process of motor activity known as “Embodied Cognition”. Lower level motor (physical) activity results in decline of cognitive processes is considered to be well recognized risk factor of Dementia. The stimulation of MN to activate motor functions at early stage of Dementia can be possible considering these factors: (i) Movements learned from activity of mirror neurons based on understanding intention or goal of the action (coupling of action-perception representations) instead of recall of movement patterns. (ii) The visual inputs can activate mirror neuron clusters where the imitation is based on understanding intention or goal of the action (i) Movements learned from activity of mirror neurons introducing vascular pulsatility imposing mechanical stretch on endothelium. This study aimed to investigate cyclic stretch on human cerebral microvascular endothelial cells (HCMECs) in expression and processing of APP, and to investigate effect of high salt diet on APP processing in rat brains, given associations of high salt diet and cognitive impairment. HCMECs were subjected to 0%, 5%, 10% or 15% stretch (18 hours, 1 Hz) and protein and RNA expression, and Aß levels were analysed. Rats were treated with a high (8% NaCl, HSI) or a low (0.26% NaCl, control) for 10–13 weeks and brain tissue was examined. APP expression and Aß secretion were altered in response to HCMECs stretch, and this was differentially mediated in early and late passage HCMECs. In late passage HCMECs, APP and BACE-1 expression increased 2-3 fold with 10-15% stretch compared to 0%, with proportional increases in Aß40/42 (p=0.01). In early passage HCMECs stretched at 15%, APP expression, BACE-1, Aß42 levels were decreased 2-3 fold compared to late passage HCMECs. Evidence of altered APP processing in HS rats compared to controls parallel with increases in markers of arterial stiffness was obtained. Results suggested a role of arterial stiffness and vascular pulsatility strengthening evidence of vascular contributions to AD. Future studies identifying associated molecular mechanisms will provide novel therapeutic targets for AD.
Background: Preclinical testing of candidate treatments in mouse models of Huntington’s disease (HD) provides the basis to inform clinical trials in humans. Yet, positive results from HD mouse models rarely translate to successes in humans. A key limitation for translation is the misalignment between measures used to demonstrate treatment efficacy in mice and cognitive outcomes used in humans. In mouse preclinical studies, cognitive outcome measures are based on visual or spatial cognition. In contrast, cognitive outcome measures in HD clinical trials are selected for their sensitivity in detecting impairments rather than maintaining fidelity to methods used in preclinical testing.

Aim: Using the domain of spatial memory, we aim to close the gap in HD clinical trial cognitive assessment methodology. Spatial memory can be readily tested in preclinical HD models and in humans, and current clinical trials are focusing at regenerating neurons in brain areas critical for spatial memory and HD.

Method: We studied premanifest HD (N=24), early HD (N=14), and matched controls (N=33) with several spatial memory measures, and across navigation, object-location, map drawing, and complex constructional praxis.

Results: HD participants performed significantly worse relative to controls on all spatial memory variables. Premanifest HD performed better than early HD, but overall showed impaired function. Object-location was the spatial memory component most notably impaired in premanifest HD (p=0.009).

Significance: Delineation of spatial memory impairments in people with HD has important implications for testing treatments for HD as it provides a cognitive basis that is translatable from preclinical testing to human trials.

Theme: Prevention
Dementia prevention: views, attitudes and beliefs of general practitioners and practice nurses
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To promote dementia prevention in primary practice, researchers need to collaborate with primary care practitioners (PCPs). First, however, researchers need to understand PCPs’ views about using inconclusive evidence to cooperate with patients to reduce dementia risk factors. For this narrative synthesis, we searched MEDLINE, PsycINFO, CINAHL and Embase for English-language articles published between 1995 and December 2017, focusing on search terms based on the concepts of “dementia” and “prevention,” and on outcomes such as “views”, “attitudes”, and “beliefs”. The search strategy identified six survey studies and one qualitative study. Thematic synthesis of the limited data suggested a justifiably cautious approach to dementia prevention in primary care. Many PCPs do not view dementia as preventable; (ii) hold beliefs about dementia risk factors that are not evidence-based; (iii) advise patients to increase activity rather than take medication; (iv) are reluctant to initiate a discussion about dementia risk reduction, and (v) want better evidence for dementia prevention. There were few aspects of dementia prevention in which the views, attitudes and beliefs of PCPs clearly converged. A local qualitative study is planned to contextualise these findings. Future attempts to collaborate with PCPs in dementia prevention efforts will need to consider the variety of views, attitudes and beliefs of the PCPs concerned.

Theme: Assessment and Diagnosis
Translating cognitive outcomes from mouse preclinical testing to human clinical trials in the search for Huntington’s disease treatments
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Background: Preclinical testing of candidate treatments in mouse models of Huntington’s disease (HD) provides the basis to inform clinical trials in humans. Yet, positive results from HD mouse models rarely translate to successes in humans. A key limitation for translation is the misalignment between measures used to demonstrate treatment efficacy in mice and cognitive outcomes used in humans. In mouse preclinical studies, cognitive outcome measures are based on visual or spatial cognition. In contrast, cognitive outcome measures in HD clinical trials are selected for their sensitivity in detecting impairments rather than maintaining fidelity to methods used in preclinical testing.

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Significance: Delineation of spatial memory impairments in people with HD has important implications for testing treatments for HD as it provides a cognitive basis that is translatable from preclinical testing to human trials.
Lipid peroxidation contributes to synaptic dysfunction and neuronal degeneration, both upstream and downstream of Alzheimer’s disease. A key enzyme that protects cells from lipid peroxidation is Glutathione Peroxidase 4 (GPX4), which requires selenium to function. Mutations in the presenilin genes (PSEN1 and PSEN2) account for the majority of familial Alzheimer’s disease cases. In cultured cells that have inhibited β-secretase function by pharmacological inhibition, or genetic ablation of the PSEN1/2 genes, we found lower levels of selenium and GPX4 and a concomitant elevation of lipid peroxidation. Moreover, cells with inhibited PSEN1/2-secretase function are acutely susceptible to ferroptosis, an iron-regulated form of cell death that is triggered by lipid peroxidation. Ability to self-toilet declines during the course of dementia. Toileting is the most common task undertaken by staff in residential care settings, comprising 21% of daily care activities. Assisting a dependent person with dementia (PWD) with toileting is frequently physically and emotionally stressful and has been associated with low occupational status for care staff. Post-voiding cleaning can be a source of embarrassment and indignity for the PWD and for some, cleaning assistance may be interpreted as invasive and rejected with distress, agitation or aggression. The electronic toilet-top bidet is a novel assistive technology that provides an automated wash of the perineum and perianal areas that may be an improvement in the toileting experience for PWD and staff. As part of a 12-week, mixed-methods, clinical utility study of the bidet in 2 Australian aged care homes, we compared workload associated with bidet assisted and usual, manual toileting care of 32 residential aged care staff using the NASA Task Load Index (TLX). The TLX conceptually works as a multi-dimensional and captures subjective ratings of 8 elements of workload on a 21-point bi-polar scale. Related samples Wilcoxon signed rank tests indicated a significant reduction in overall workload when using the electronic bidet (Z=148.50, p < 0.03), as well as significant reductions in effort, mental, physical and time demands. Staff focus groups indicated the bidet was a useful technology capable of being incorporated in to daily routines. However, care must be taken to prescribe bidet compatible equipment for transferring to non-ambulant residents.
TRANSIENT OVEREXPRESSION OF MUTANT CCNF WAS SHOWN TO MODEL TO ALLOW LONGITUDINAL STUDIES IN AN ADULT ANIMAL.

ZEBAFISH OVEREXPRESSION MODELS — A TRANSIENT MODEL, AND DEMENTIA. WE HAVE ESTABLISHED TWO CCNF-BASED AS USEFUL MODELS WITH WHICH TO STUDY BOTH ALS AND GENETICALLY LINKED TO AMYOTROPHIC LATERAL SCLEROSIS (ALS), A DISEASE CHARACTERISED BY THE PROGRESSIVE LOSS OF MOTOR FUNCTION. GENE MUTATIONS REMAIN THE ONLY PROVEN CAUSE OF BOTH DISEASES AND MULTIPLE MUTATIONS COMMON TO BOTH FTD AND ALS HAVE BEEN IDENTIFIED. OUR LABORATORY RECENTLY IDENTIFIED NOVEL ALS-FTD LINKED MUTATIONS IN CCNF. CYCLIN F, ENCODED BY CCNF, IS INVOLVED IN REGULATING PROTEIN DEGRADATION THROUGH THE UBQUITIN PROTEASOME SYSTEM. EVIDENCE SUGGESTS THAT DISRUPTION TO PROTEIN HOMEOSTASIS IS A KEY FEATURE OF THE BIOLOGY OF FTD AND ALS. THE IDENTIFICATION OF DISEASE-LINKED MUTATIONS IN CCNF PROVIDES AN OPPORTUNITY TO DEVELOP NOVEL DISEASE MODELS WITH WHICH TO INVESTIGATE DYSFUNCTION IN THIS PATHWAY.

MULTIPLE ASSAYS HAVE BEEN ESTABLISHED WHICH ENABLE ASSESSMENT OF MOTOR FUNCTION AND COGNITIVE FUNCTION IN ZEBRAFISH. CONSEQUENTLY, ZEBRAFISH HAVE EMERGED AS USEFUL MODELS WITH WHICH TO STUDY BOTH ALS AND DEMENTIA. WE HAVE ESTABLISHED TWO CCNF-BASED ZEBRAFISH OVEREXPRESSION MODELS — A TRANSIENT MODEL, TO PROVIDE A TOOL FOR RAPID ANALYSIS AND PRELIMINARY TESTING OF POTENTIAL THERAPEUTICS, AND AN INDOUCIBLE TRANSGENIC MODEL TO ALLOW LONGITUDINAL STUDIES IN AN ADULT ANIMAL. TRANSIENT OVEREXPRESSION OF MUTANT CCNF WAS SHOWN TO INDUCE CELL DEATH, LEAD TO A MOTOR NEURON AXONAPATHY AND IMPAIR MOTOR FUNCTION. PERSISTENT EXPRESSION OF MUTANT CCNF IN ADULT ZEBRAFISH INDUCED PROGRESSIVE LOSS OF MOTOR FUNCTION AND A REDUCED NUMBER OF SPINAL MOTOR NEURONS. THIS DATA SUGGESTS THAT THE CCNF-BASED ZEBRAFISH MODELS WILL PROVIDE USEFUL TOOLS FOR INVESTIGATING THE PATHOGENESIS OF CCNF-LINKED NEURODEGENERATION.

BACKGROUND: MELATONIN HAS MULTIPLE KNOWN THERAPEUTIC BENEFITS. IT HAS ANTI-OXIDANT PROPERTIES, SYNCHRONISES THE CIRCADIAN SYSTEM AND ALSO PROMOTES SLEEP. THESE ARE ALL PATHWAYS THAT COULD BE TARGETED TO SLOW COGNITIVE DECLINE ASSOCIATED WITH AGING. PREVIOUS RANDOMISED CONTROLLED STUDIES HAVE TARGETED PATIENTS WITH ESTABLISHED DEMENTIA/ALZHEIMER’S DISEASE IN WHOM CHANGES TO BRAIN STRUCTURE AND FUNCTION MAY BE TOO ADVANCED TO ELICIT A SIGNIFICANT BENEFIT. WE THEREFORE PROPOSE USING MELATONIN IN PARTICIPANTS WITH MILD COGNITIVE IMPAIRMENT (MCI) TO TARGET MODIFIABLE RISK FACTORS IN THIS POPULATION AT RISK FOR FURTHER COGNITIVE DECLINE.

THIS STUDY AIMS TO DETERMINE THE FEASIBILITY OF A RANDOMISED CONTROLLED TRIAL OF 6 MONTHS OF DAILY MELATONIN SUPPLEMENTATION (25mg) IN OLDER ADULTS WITH MCI. METHODS: FORTY OLDER ADULTS (AGED 60–80 YEARS) WITH MULTI-DOMAIN MCI (EITHER AMNestic OR NON-AMNestic) WILL BE RECRUITED INTO THIS RANDOMISED PLACEBO CONTROLLED, DOUBLE-BLIND TRIAL. PARTICIPANTS WILL BE RANDOMLY ALLOCATED TO MELATONIN (25mg) OR PLACEBO FOR SIX MONTHS. THE PRIMARY OUTCOME IS BRAIN OXIDATIVE STRESS (USING MAGNETIC RESONANCE SPECTROSCOPY) AS ASSESSED BY GLUTATHIONE CONCENTRATION. SECONDARY OUTCOMES INCLUDE SLEEP (WRIST ACTIGRAPHY AND QUESTIONNAIRES), MOOD AND MELATONIN LEVELS.

SIGNIFICANCE: AS NO CURE FOR DEMENTIA CURRENTLY EXISTS, IT IS CLEAR FROM A CLINICAL AND FINANCIAL PERSPECTIVE, THAT EARLY INTERVENTION STRATEGIES TO SLOW COGNITIVE DECLINE ARE URGENTLY REQUIRED. THE ABILITY TO DELAY THE ONSET OF DEMENTIA BY 5 YEARS IS ESTIMATED TO REDUCE THE OVERALL PREVALENCE BY NEARLY 50%. THEREFORE NOVEL INTERVENTIONS ADMINISTERED EARLY PROVIDE THE GREATEST CHANCE TO DELAY AND ULTIMATELY PREVENT THE PROGRESSION OF COGNITIVE DECLINE THAT LEADS TO DEMENTIA.

AN ELECTRONIC GAITRITE WALKWAY. GAIT VARIABILITY WAS THE STANDARD DEVIATION OF ALL STEPS FOR EACH GAIT MEASURE, TIME, STEP LENGTH, BASE OF SUPPORT AND DOUBLE SUPPORT TIME (DST). MCI TARGETS MODIFIABLE RISK FACTORS IN THIS POPULATION AT RISK FOR FURTHER COGNITIVE DECLINE. THEREFORE, THE AIM OF THIS STUDY WAS TO DETERMINE WHETHER BASELINE GAIT VARIABILITY WAS ASSOCIATED WITH DECLINE IN 4 DIFFERENT COGNITIVE DOMAINS. METHODS: PARTICIPANTS (N=410; MEAN AGE 72.0±7.0) WERE RANDOMLY SELECTED FROM THE SOUTHERN TASMANIAN ELECTORAL ROLL. MEASUREMENTS WERE TAKEN AT BASELINE, 2.6 AND 4.6 YEARS. GAIT VARIABLES (STEP TIME, STEP LENGTH, BASE OF SUPPORT AND DOUBLE SUPPORT TIME) WERE MEASURED USING AN ELECTRONIC GAITRITE WALKWAY. GAIT VARIABILITY WAS THE STANDARD DEVIATION OF ALL STEPS FOR EACH GAIT MEASURE. MEMORY, PROCESSING SPEED, EXECUTIVE FUNCTION AND VOLUMETRIC MEASUREMENTS WERE MEASURED USING A BATTERY OF NEUROPSYCHOLOGICAL TESTS. COVARIATES INCLUDED AGE, SEX AND EDUCATION. MULTIVARIABLE MIXED MODELS WERE USED TO EXAMINE ASSOCIATIONS BETWEEN BASELINE GAIT VARIABILITY AND COGNITIVE DOMAINS OVER TIME. RESULTS: OVER AN AVERAGE OF 4.6 YEARS THERE WAS A SIGNIFICANT DECLINE IN ALL COGNITIVE DOMAINS (P<0.001). HIGHER VARIABILITY IN STEP LENGTH AND DURATION WAS ASSOCIATED WITH GREATER DECLINE IN EXECUTIVE FUNCTION (P FOR INTERACTION=0.04) AND MEMORY (P=0.02). NONE OF THE GAIT VARIABILITY MEASURES WERE ASSOCIATED WITH PROCESSING SPEED (P>0.05) OR VOLUMETRIC MEASUREMENTS (P>0.05). CONCLUSION: STEP LENGTH VARIABILITY AND DURATION VARIABILITY APPEAR TO BE MARKERS OF DECLINE IN EXECUTIVE FUNCTION AND MEMORY, AND MAY ASSIST IN THE EARLY DETECTION OF FUTURE DEMENTIA.
Towards building a citizen science community: An Australia-wide dementia research participation and public engagement platform

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There is no systematic way for people with dementia to get involved in research, and limited support is available to facilitate a broader public engagement in dementia research. Recruiting participants in dementia research is costly and time-consuming. Delays in finding the right people for studies can result in studies taking longer to deliver, often requiring funding extensions and ultimately limit the effectiveness of research and evaluation when study samples are insufficient for robust analysis and generalisation of findings.

The UK’s public engagement platform, Join Dementia Research, aims to address such challenges associated with public engagement in dementia research. Since 2015 JDR has attracted over 34,000 volunteers, facilitating 9,377 instances of volunteer study recruitment, into 201 studies across more than 100 locations. Leveraging the experience and knowledge of JDR, in partnership with University College London and University of Exeter, we are creating and implementing a new national service to tackle the challenges in Australia.

This presentation will report on the most up-to-date progress made through JDR in improving public engagement in dementia research in the UK and the early implementation processes involved in the Australian platform service. Discussion will focus on bringing about sustainable and systemic change, not only to improve research recruitment efficiency but also to improve society’s attitudes towards dementia and empower those who are directly and indirectly affected by it. We argue that this innovative service has the potential to inform and guide dementia services and research policy development, and lead to an inclusive and integrated system.

Using blood lipid biomolecules to differentiate frontotemporal dementia from Alzheimer’s disease

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Behavioral variant frontotemporal dementia (bvFTD) is the most prevalent form of FTD syndromes. bvFTD is characterized pathologically by focal brain atrophy and concomitant loss of lipids, and clinically by eating abnormalities resulting in dysphagia. bvFTD patients are commonly misdiagnosed as Alzheimer’s disease (AD) because of overlap in clinical presentations. bvFTD patients, AD patients and controls consented to a variety of clinical and apolipoproteins from the patients (n=18,14,22) using mass spectrometry-based lipidomics and FPLC. The aims of the study were to understand dyslipidemia in bvFTD and to identify lipid biomolecules that can objectively differentiate bvFTD from AD and controls. We identified a number of lipid species that was significantly altered in bvFTD compared to AD and controls. Triglyceride levels increased significantly in bvFTD, whereas phosphatidylserine, phosphatidylglycerol, monogalactosydiglycerol and steryl ester levels decreased significantly in bvFTD. The abundance of lipids with unsaturated fatty acids also increased in bvFTD; the greater the unsaturation the greater the susceptibility to oxidative damage, i.e. neurodegeneration. Furthermore, apoA-I and apoA-II levels decreased significantly in bvFTD, whereas apoB levels remained unchanged. These data indicate significant changes in the circulating lipids and apolipoproteins in bvFTD and provide evidence for hypertriglyceridemia and hypoalphalipoproteinemia. This study represents the first lipidomics and apolipoprotein analyses of bvFTD and has provided new insights into an unrecognized perturbed lipid pathology in bvFTD, providing evidence in support of considerable lipid dysregulation in bvFTD.
Dementia is a major health problem with 200 Australians diagnosed every day and at least as many having mild cognitive impairment (MCI). Early identification of cognitive impairment is critical for interventions and objective cognitive data are essential for this. Hence, there is an urgent need to develop a method of neuropsychological testing that is efficient and accessible while maintaining appropriate standards of reliability and validity, to meet current and future demands and to facilitate timely and accurate diagnosis. Computer-administered tests offer excellent opportunities for large scale implementation of computer screening and monitoring. However, the current evidence base for use of computerised neuropsychological tests in older adults and patients with cognitive disorders is low. CogSCAN is the first systematic, independent evaluation of the psychometric properties, acceptability and performance of four prominent computerised neuropsychological assessment instruments currently in the field within this older adult population.

The cohort will consist of 408 community-living participants (cognitively normal, MCI) and 162 clinically-referred patients with MCI and mild dementia, aged 60 and older. Four computer test batteries (CTB) will be evaluated:Cogstate, CANTAB, Cambridge Brain Sciences and NIH Toolbox. CTB’s are administered via iPad under supervision in small groups. Participants are assigned to a 1-month test-retest reliability study arm (2 CTBs) or to a construct validity arm in which they receive 2 CTBs and a standardised pen and paper neuropsychological assessment one week apart and at one year to examine test responsiveness. The influence of demographics, computer familiarity and attitudes on test performance will be examined.

A clinical quality registry (CQR) can help to systematically monitor the quality of dementia diagnosis and care, and identity variation in clinical outcomes. The Australian Commission on Safety and Quality in Health Care identified dementia as a CQR priority area in 2016 and similar initiatives have been implemented internationally. In 2017 Monash University received funding from the Commonwealth Boosting Dementia Research program to develop methodology for a dementia CQR. This project aims to establish a pilot dementia CQR via three programs of work. Phase 1 includes development of Clinical Quality Indicators (CQIs) and a Minimum Dataset via Delphi process, and testing the feasibility of these CQIs and Minimum Dataset via data collection. Phase 2 comprises recruitment of ASPREE participants with a clinical diagnosis of dementia or mild cognitive impairment (MCI) into a pilot CQR. Phase 3 will test the feasibility of recruiting newly diagnosed individuals in the community. This presentation reports preliminary data from Phase 1 regarding a modified Delphi process to develop CQIs based on a review of Australian and international clinical dementia care guidelines and advice from an Expert Panel. We will also present the methodology that identified a suitable CQR study cohort from existing ASPREE participants. Throughout the three phases the project engages key stakeholders, including clinicians, people living with dementia and their carers. We expect that outcomes from this pilot registry will inform and assist in the development of the Australian National Dementia Registry.
The P16INK4a protein is involved in the maintenance of gene stability, inhibition of the cell cycle and the senescence of terminally differentiated cells such as neurons. Dysfunction of the cell cycle including cell cycle activation in post-mitotic neurons and inappropriate neuronal cell cycle control are critical events in Alzheimer’s disease (AD) pathogenesis. The tau protein plays a part in microtubule stability, however when hyperphosphorylated, tau can assemble into neurofibrillary tangles (NFTs) which accumulate in AD and can lead to cell death. This research looked at the relationship between P16INK4a and tau depositions in the progression of AD. Following ethics approval, formalin-fixed, paraffin-embedded tissue sections of the anterior cingulate cortex from 38 donated brains with varying Braak staging were obtained from the NSW Brain Banks. Quantitative P16INK4a and tau immunofluorescence was performed and comparisons made between the levels of P16INK4a expressed in tau positive and tau negative neurons. The expression of P16INK4a in tangle-bearing neurons varied significantly between groups (ANOVA p=0.157). However the expression of P16INK4a in tangle-bearing neurons varied significantly between groups (ANOVA p=c.000), with this proportion decreasing with advancing Braak stage (ANOVA p=<.0009). This suggests that a disturbance of neuronal senescence occurs early in AD, and is associated with tau accumulation and NFT formation. Our study supports the hypothesis that the P16INK4a protein may play an active inhibitory role in AD neurodegeneration.

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Community Controlled Health Services (ACCHOs)
to optimise detection and management of cognitive
Dementia: A protocol for a stepped wedge design
Let’s CHAT (Community Health Approaches To)
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Residential Aged Care (RAC) residents with dementia who engage in risky wandering experience adverse outcomes (weight loss, fatigue, injury from falls, resident-to-resident violence, becoming lost and death). Feasibility, acceptability and sustainability of two different tailored behavioral interventions for residents with severe dementia who wander were trialed separately: 1) One-on-one supervised daily 20-minute outdoor walking sessions (n=7) and 2) Individual daily 20 minute indoor listening to preferred music sessions (n=10). Walking sessions were initiated and completed more frequently than music sessions (80% vs. 61%). The majority (80%) of commenced walking sessions lasted the full duration while only 60% of commenced music sessions lasted the full duration. Most music sessions were terminated because the participant removed the headphones (64%) or walked away from the speaker (32%). While staff were concerned that a tailored daily walk involving care staff would be difficult to sustain with the care routines, a similar concern about music sessions was not raised. Staff and family carers suggested that a dedicated room was needed to implement the music intervention to avoid interruptions. Despite high intervention fidelity and staff and family commitment to the benefits of both interventions (e.g. improved mood, reduced solitary walking), neither intervention has immediate strong clinical applicability potential. Staff attitudes towards tailored programming and the impact this has on care routines, issues with the music delivery protocol, and questions about appropriate dose impact acceptability/sustainability. Refinement of the interventions and implementation strategies will be discussed as methods to address clinical applicability and sustainability in the RAC setting.

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Let’s CHAT (Community Health Approaches To)
Dementia: A protocol for a stepped wedge design
to optimise detection and management of cognitive
impairment (CI) including dementia in Aboriginal
Community Controlled Health Services (ACCHOs)

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The population of older Aboriginal and Torres Strait islander people over 65 years is projected to double by 2026. Aboriginal and Torres Strait Islander older people play a crucial role in their communities, including holding cultural rights and responsibilities for maintaining connections to Country, caring for extended family and providing leadership. Previous work by our team has documented that Aboriginal and Torres Strait Islander peoples experience rates of dementia and Cognitive Impairment (CI) that are three to five times the rate of the rest of the population in both urban and remote regions. In addition, this team has developed, adapted and validated a range of culturally appropriate screening tools for use with older Aboriginal and Torres Strait Islander peoples.

This study aims to implement and evaluate a culturally responsive best practice model of care embedded within current Aboriginal Community Controlled Health Organisations (ACCHOs) and systems to optimise the timely detection and ongoing management of people with CI including dementia. This national, stepped wedge cluster randomised control trial, undertaken in collaboration with 12 ACCHOs across four states is currently in its development phase of co-design. Primary outcome measures include improved detection and management of dementia, and secondary aims include improved quality of life of carers and older Aboriginal and Torres Strait Islander people with cognitive impairment. In this presentation the protocol for this study will be described.

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Primary neuronal cultures are a powerful tool to understand neuronal maturation, aging and neurodegeneration. They have been used to screen the effects of drugs and misfolded proteins on neural networks in vitro. However, culturing primary neurons in vitro is notoriously difficult, owing to their high sensitivity to their environment. Currently, primary neurons are cultured on glass coverslips coated with poly-D-lysine (PDL). However, it is well known that significant differences exist in cell behaviour in a 2D versus 3D environment, which more accurately mimics in vivo conditions. Hydrogels have significant potential biomedical applications, including in cell culture, owing to their similarity to the extracellular matrix. We have previously used short peptides capped at their N-terminus with an aromatic group to form biocompatible hydrogels with tuneable stiffnesses, pore sizes and chemical functionalities. Here, we present a collaborative, multidisciplinary effort where short peptide hydrogels which support the growth of primary neurons in a 2D and 3D environment have been developed. Neurons cultured atop these hydrogels display initial development and maturation comparable to that on PDL, complete with synapse formation and electrical activity. Neurons can also be cultured within the hydrogels, with these 3D neuronal cultures having potential in identifying neurodegenerative disease biomarkers, better screening of drug molecules, modelling CNS damage and insights into aging.
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Diagnostic screening is required to identify persons with Cognitive Impairment (CI). This screening should be applied to individuals over 70, but it is relevant to many admitted patients. A strategy designed only for patients with CI adds burden to a workforce that is already unable to manage clinical care and documentation. A “universal” system that also deals specifically with the issues related to CI is desirable. interRAI is an international not-for-profit collaboration which establishes scientifically robust health assessment systems.

The interRAI Acute Care (AC) was pilot tested in 910 adult patients at admission (N=4 hospitals). 24.3% of patients had short term memory problems, common across all age groups. Delirium is a significant issue in AC, with 4.7% of participants having an acute change in mental status. Self-reported poor health was present in 18.7% of the participants. Finally, pain was present in all age groups (66.2%).

The interRAI AC comprising 56 clinical observations and applications pertaining to CI, including accurate diagnostic screening for delirium and dementia (and suggestions for care planning), is administered to all adult patients at admission. Completion time is less than 15 minutes including data entry.

Through extensive experience implementing interRAI assessment systems around the world, the interRAI AC is now being implemented in Australia (in the SNACKS project; NHMRC Dementia Project) as an electronic nursing assessment system. The AC is being implemented in 18.7% of the participants. Finally, pain was present in all age groups (66.2%).

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Overview: Inhibition of BACE1 (ß-secretase) is a promising treatment for Alzheimer’s disease. BACE inhibitors also affect the functions of proteins not associated with Alzheimer’s disease pathology including the Seizure-related gene 6 (Sez6) family of proteins [1]. Sez6 is required for normal development and maintenance of excitatory synapses [2] and contributes to the decreased cortical spine turnover seen in wild-type (WT) mice treated with BACE inhibitor [3]. Sez6-like, recently validated as a BACE1 substrate in vivo, is expressed widely within the brain [4]. Results: Sez6 family knockout (KO) mice have motor deficits on the rotarod as reported [5] within the brain [4]. Results: Sez6 family knockout (KO) mice have motor deficits on the rotarod as reported [5]. The pathogenesis of sporadic Alzheimer’s disease (AD) is largely unknown. Comparisons between areas differentially affected by AD pathology in individuals with dementia may provide opportunities to model the natural history of AD. Microglia are known to have a role in AD pathogenesis but there are conflicting opinions on whether this is due to their pro-inflammatory effects or loss of their normal functions. An immunohistochemical investigation was undertaken to quantify tau and beta-amyloid pathology and residual neurons in three increasingly affected areas of the AD brain: the primary visual cortex, the superior frontal gyrus and the inferior temporal gyrus. AD pathology was correlated with microglial morphological subtypes: ramified (normal), activated or dystrophic. There were decreased total and ramified microglia in AD cases but only in the inferior temporal gyrus. Furthermore, ramified microglia were inversely correlated with tau pathology in the AD cases. In other areas there were inverse correlations between dystrophic microglia and brain pH and a correlation between activated microglia and age in the superior frontal gyrus. Immunofluorescent microscopy showed occasional dystrophic microglia co-localising with tau positive neuritic plaques but not neurofibrillary tangles. In summary there is a loss of microglia function occurs in AD, but only late in the disease course.

Microglial subtypes in differentially affected areas of the Alzheimer’s disease brain

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The patients are followed with time to understand the causal assessment (situational analysis) and the maximum impact. The Vietnam national dementia planning framework to ensure that our activities achieve intervention planning and evaluation into one overarching platform for the development of a Vietnam National Dementia Plan

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Background: Accounting for nearly 60% of dementia cases worldwide, LMICs are facing a much more rapid growth in the numbers of people with dementia, yet less equipped to respond to their corresponding needs compared to high-income countries. The catastrophic costs of intensive and long-term care needed for people with dementia, especially at advanced stage, are mostly borne in informal care of unpaid family members in LMICs. Vietnam is not an exception. Without strategic preventive interventions or curative treatment breakthroughs, there might be as many as 2.4 million people with dementia in Vietnam by 2050. There is an urgent need for countries like Vietnam to develop a national dementia plan to ensure that adequate care and services are provided to both people with dementia and their carers now and in the future.

Proposal: In collaboration with dementia investigators from the DCRC and CDPC, we will work with Vietnamese researchers and key stakeholders to build an evidence platform for the development of a Vietnam National Dementia Plan. Our research programme will include a situational analysis to generate scientific knowledge to inform stakeholders about the context or environment in which their proposed national dementia plan will be embedded. We will use Theory of Change, guided by the PRECEED – PROCEED model, to link the causal assessment (situational analysis) and the intervention planning and evaluation into one overarching planning framework to ensure that our activities achieve maximum impact. The Vietnam national dementia plan will then be formulated in the light of the resulting evidence platform.

The project is a member of GAAIN, which supports data storage among global partners to aid Alzheimer’s disease research.

The Artemis Project and GAAIN

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Sez6 family proteins are BACE1 substrates with important roles in spine morphology, cognition and motor function

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Overview: Inhibition of BACE1 (ß-secretase) is a promising treatment for Alzheimer’s disease. BACE inhibitors also affect the functions of proteins not associated with Alzheimer’s disease pathology including the Seizure-related gene 6 (Sez6) family of proteins [1]. Sez6 is required for normal development and maintenance of excitatory synapses [2] and contributes to the decreased cortical spine turnover seen in wild-type (WT) mice treated with BACE inhibitor [3]. Sez6-like, recently validated as a BACE1 substrate in vivo, is expressed widely within the brain [4]. Results: Sez6 family knockout (KO) mice have motor deficits on the rotarod as reported [5] within the brain [4]. Results: Sez6 family knockout (KO) mice have motor deficits on the rotarod as reported [5].

The pathogenesis of sporadic Alzheimer’s disease (AD) is largely unknown. Comparisons between areas differentially affected by AD pathology in individuals with dementia may provide opportunities to model the natural history of AD. Microglia are known to have a role in AD pathogenesis but there are conflicting opinions on whether this is due to their pro-inflammatory effects or loss of their normal functions. An immunohistochemical investigation was undertaken to quantify tau and beta-amyloid pathology and residual neurons in three increasingly affected areas of the AD brain: the primary visual cortex, the superior frontal gyrus and the inferior temporal gyrus. AD pathology was correlated with microglial morphological subtypes: ramified (normal), activated or dystrophic. There were decreased total and ramified microglia in AD cases but only in the inferior temporal gyrus. Furthermore, ramified microglia were inversely correlated with tau pathology in the AD cases. In other areas there were inverse correlations between dystrophic microglia and brain pH and a correlation between activated microglia and age in the superior frontal gyrus. Immunofluorescent microscopy showed occasional dystrophic microglia co-localising with tau-positive neuritic plaques but not neurofibrillary tangles. In summary there is a loss of microglial function occurs in AD, but only late in the disease course.

Microglial subtypes in differentially affected areas of the Alzheimer’s disease brain

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The patients are followed with time to understand the causal assessment (situational analysis) and the maximum impact. The Vietnam national dementia planning framework to ensure that our activities achieve intervention planning and evaluation into one overarching platform for the development of a Vietnam National Dementia Plan

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International collaboration to build an evidence platform for the development of a Vietnam National Dementia Plan

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Background: Accounting for nearly 60% of dementia cases worldwide, LMICs are facing a much more rapid growth in the numbers of people with dementia, yet less equipped to respond to their corresponding needs compared to high-income countries. The catastrophic costs of intensive and long-term care needed for people with dementia, especially at advanced stage, are mostly borne in informal care of unpaid family members in LMICs. Vietnam is not an exception. Without strategic preventive interventions or curative treatment breakthroughs, there might be as many as 2.4 million people with dementia in Vietnam by 2050. There is an urgent need for countries like Vietnam to develop a national dementia plan to ensure that adequate care and services are provided to both people with dementia and their carers now and in the future.

Proposal: In collaboration with dementia investigators from the DCRC and CDPC, we will work with Vietnamese researchers and key stakeholders to build an evidence platform for the development of a Vietnam National Dementia Plan. Our research programme will include a situational analysis to generate scientific knowledge to inform stakeholders about the context or environment in which their proposed national dementia plan will be embedded. We will use Theory of Change, guided by the PRECEED – PROCEED model, to link the causal assessment (situational analysis) and the intervention planning and evaluation into one overarching planning framework to ensure that our activities achieve maximum impact. The Vietnam national dementia plan will then be formulated in the light of the resulting evidence platform.

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The Artemis Project and GAAIN

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The Spectrum of Sporadic Early Onset Dementia: The Artemis Project and GAAIN

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Early onset dementia (EOD) has its onset prior to the age of 65. We aim to understand clinical presentations, spectrum of sporadic EOD; and to share this information, and genomic and proteomic data with GAAIN.

Over the past 5 years in Perth, Western Australia, ‘The Artemis Project’ has evaluated 250 patients with a dementing syndrome: Alzheimer’s disease (AD), frontotemporal dementia (FTD) and other disorders. All patients undergo a neurological evaluation, MRI or CT, EEG, PET scan if appropriate, neuropsychological assessment, blood investigations and storage of DNA and serum for genomic and proteomic studies. The patients are followed with time to understand the natural history of their EOD.

Of the 250 patients with EOD, 150 have early onset Alzheimer’s disease (EOAD), 75 FTD and 25 other diagnoses. In the EOAD group there are more patients with memory loss. In the FTD group there is prominent behavioural change and more patients with an extrapyramidal syndrome. No significant differences exist in other variables. There is heterogeneity in patients with EOAD as some have an extrapyramidal syndrome, posterior cortical atrophy or a linguistic presentation. Additionally, there may be patients with a tau proteinopathy, primary progressive aphasia or semantic dementia. Some patients may have other diagnoses including Lewy body disease, vascular cognitive impairment, motor neurone disease with cognitive change and prodromal AD. Understanding this heterogeneity assists translational research into the understanding and treatment of EOD.

The Artemis Project is a member of GAAIN, which supports data storage among global partners to aid Alzheimer’s disease research.
Evidence suggests that poor sleep is related to several key processes implicated in Alzheimer’s disease. For example, interrupted slow wave sleep has been associated with the acute accumulation of amyloid beta and sleep disordered breathing has been associated with ischemic brain injury. However, the associations between poor sleep and the risk of future dementia are not well understood. We performed a series of studies to examine the associations between subjective and objective sleep quality and the risks of incident dementia in the community-based prospective Framingham Heart Study (FHS). In the first study, we examined whether changes in self-reported sleep duration were a sign of impending dementia. We quantified sleep time and clinical practice. We will implement a discussion forum on the topic in the BDC, a fully online degree program undertaken by participants with MCI will be recruited for testing. Upon completion of the co-design development process, user acceptance testing will be done with the stakeholders. As a result of the first session). Prior to deployment, ‘useability and accessibility’ elements of the application were co-designed and co-facilitated by people with dementia and their care partners. Evaluation highlighted that CBPAR was useful to support the involvement and empowerment of people with dementia and the engagement of the community to improve awareness. The direct involvement of people living with dementia was also an effective way to improve positive attitudes and reduce the negative stereotypes associated with living with dementia. Results highlight the multiple benefits of applying the principle of ‘nothing about us without us’ in both dementia research and community action.
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Testing the utility of the ASCOT-Easy Read Toolkit to assess quality of life in community dwelling older people with cognitive impairment

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Understanding the extent to which community care services are supporting choice and quality of life for people with dementia is of critical importance. However, there is currently an absence of inclusive, valid and reliable tools to support people with cognitive impairment to report on their care-related outcomes.

An international collaboration between researchers at the University of Wollongong (NSW, Australia) and the Personal Social Services Research Unit (PSSRU) at the University of Kent (UK) has worked to support the adaptation and cognitive testing of an Easy Read version of the Adult Social Care Outcomes Toolkit (ASCOT-ER) with community dwelling older people with cognitive impairment.

Cognitive interviewing was used with Home Care Packages recipients in the Illawarra — Shoalhaven (NSW, Australia) and the Personal Social Services Research Unit (PSSRU) at the University of Kent (UK) to develop the ASCOT-Easy Read Toolkit.

Outcomes to date: five practices have agreed to participate in the Program and attended an initial meeting to reach agreement on measurable. A whole day dementia education program has been delivered to members of those practices. Practices are learning and using quality improvement methodologies including Plan-Do-Study-Act cycles, supported by the PHN, in order to achieve outcomes.

Conclusion: A quality improvement approach coordinated through the Primary Health Network shows promise for improving dementia care outcomes in general practice.

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Risk factor analysis reveal male gender and family history difference in pathologically confirmed dementia with Lewy bodies compared with Parkinson’s disease

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Dementia with Lewy bodies (DLB) is the second most common type of clinically diagnosed dementia. However, DLB has been proven difficult to clinically differentiate from Alzheimer’s disease (AD) and Parkinson’s disease (PD). More importantly, several risk factors for DLB overlap with those for AD and PD, and risk factors predicting an increased risk for DLB versus PD are not fully established.

This study aims to assess risk factors in pathologically confirmed cases of DLB compared with PD. Longitudinally followed DLB and PD patients (N=116) with age-matched controls (N=44) from the Sydney Brain Bank were selected, without any neuropathology-specific mutations, stroke or atherosclerosis. Chi-square and logistic regression analyses were performed. When compared with controls, pathologically confirmed PD cases had significantly higher odds ratio for anxiety (p<0.01), depression (p<0.01) and were twice as likely to have a family history of dementia or PD (p<0.01). When comparing pathologically DLB cases with pathologival PD, DLB patients were more likely to be males (p<0.01) and have had a family history of dementia or PD (p<0.05). DLB patients were almost twice likely to have cardiovascular problems (p<0.01). When comparing pathologically DLB cases with pathologival PD, DLB patients were more likely to be males (p<0.01) and have had a family history of dementia or PD (p<0.05). DLB patients were almost twice likely to have anxiety, and more likely to have a higher education (p<0.05). Males were found to have 3–4 years earlier onset for PD and DLB than female patients. The dominance of male gender and family history as risk factors for DLB versus PD was confirmed. This is the only study available that explores the differences in risk factors for DLB against PD.
provide a new avenue for potential therapies. We propose (an iron-dependent form of non-apoptotic cell death) therefore, our data also suggest that ferroptosis identified as a key target in mediating ferroptosis. and glutamatergic signalling and has been recently system \( \text{xc}^- \) is at the interface between oxidative stress and motor impairment. the \( \text{R}6/1 \) mouse model of HD expresses cognitive deficits (culminating in dementia) and progressive development of clinical symptoms in HD. While there is currently no cure for HD, we recently published beneficial effects of N-Acetylcycteine (NAC) on motor deficits in HD mice. we also have pilot data which suggest effects of NAC on specific glutamatergic receptors within the hippocampus of HD mice. Even more exciting is the fact that NAC seemed to rescue the reduction of system \( \text{xc}^- \). Historically, non-Indigenous researchers were known for using Indigenous knowledge for their own career advancement rather than sharing their findings to benefit the communities involved. For such reasons, research and researchers continue to be regarded cautiously by Indigenous communities. However, as Aboriginal and Torres Strait Islander Australians experience significantly higher rates of chronic disease and a dementia prevalence rate of more than five times higher than the Australian population, addressing such health inequities remains an important area of research. To overcome such issues, non-Indigenous researchers need to focus on building relationships within Indigenous communities and involve community participation in all stages of their projects. This ensures that research is relevant to the community needs; facilitates the translation of knowledge into practice; is culturally appropriate; and recognises the cultural diversity of the communities involved. Developing effective collaborative relationships between researchers and the community is the cornerstone of community engagement but may seem daunting to new researchers unsure of how to engage in community engagement. The aim of this paper is to outline some strategies for meaningful community engagement utilised by a small group of researchers who have been collaborating for many years with local Indigenous communities to determine dementia prevalence rates in specific Indigenous communities; to identify associated risk and protective factors for dementia; and to promote healthy ageing. Insights from the research team’s own experience will be presented to provide practical examples of community engagement and consultation. Pitfalls and lessons learned will also be shared.

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Historically, non-Indigenous researchers were known for using Indigenous knowledge for their own career advancement rather than sharing their findings to benefit the communities involved. For such reasons, research and researchers continue to be regarded cautiously by Indigenous communities. However, as Aboriginal and Torres Strait Islander Australians experience significantly higher rates of chronic disease and a dementia prevalence rate of more than five times higher than the Australian population, addressing such health inequities remains an important area of research. To overcome such issues, non-Indigenous researchers need to focus on building relationships within Indigenous communities and involve community participation in all stages of their projects. This ensures that research is relevant to the community needs; facilitates the translation of knowledge into practice; is culturally appropriate; and recognises the cultural diversity of the communities involved. Developing effective collaborative relationships between researchers and the community is the cornerstone of community engagement but may seem daunting to new researchers unsure of how to engage in community engagement. The aim of this paper is to outline some strategies for meaningful community engagement utilised by a small group of researchers who have been collaborating for many years with local Indigenous communities to determine dementia prevalence rates in specific Indigenous communities; to identify associated risk and protective factors for dementia; and to promote healthy ageing. Insights from the research team’s own experience will be presented to provide practical examples of community engagement and consultation. Pitfalls and lessons learned will also be shared.

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Novel nanocrystalline particles for earlier detection of Alzheimer’s onset

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Over the past few decades, there has been a rapid growth in nanoparticles (NPs) discovery and their use for medical therapy and diagnostics [1,2]. Nanoparticles based on crystalline matrix of sodium fluoride have a pronounced ability to host functional ions, such as lanthanide ions. Gadolinium-doped nanoparticles (Gd NPs) have proven to function as enhanced contrast imaging agent for magnetic resonance imaging (MRI) [3]. In this work, we developed ultra-small Gd-doped nanocrystals as a potential MRI sensor. We established a surface functionalization protocol to stabilize NPs in biological media. Furthermore, we demonstrated surface functionalization with molecule that specifically target neuronal cells undergoing apoptosis associated with Alzheimer’s or Parkinson’s diseases. We confirmed that Gd NPs can be uptaken and well tolerated by neuronal cells at appropriate dosages. Overall, our results show a great potential as novel MRI sensor for non-invasive detection of Alzheimer’s disease.
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Co-creating a model of care for a new multidisciplinary memory clinic in South Western Sydney

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South West Sydney has the highest projected rates of dementia in all of NSW. The prevalence of dementia in Camden, Campbelltown, Macquarie Fields, and Liverpool is forecast to increase by up to 460% by 2050. To address the current and future needs of the community, our team has been working to establish a new multidisciplinary memory clinic. To inform the model of care, we conducted a needs assessment to map the existing dementia services and identify gaps in service provision for people with dementia and their carers. We interviewed 20 GPs across SWSLHD/SWSPHN and conducted 3 community forums (Campbelltown, Camden, and Liverpool) involving 53 seniors and community representatives, and 32 community healthcare workers. Interviews and community forums were audio-recorded, transcribed verbatim, and coded by thematic analysis using Quirkos. Study participants felt they had a good knowledge of available dementia resources and services, but noted that these are fragmented and need to be easier to navigate for the patient/carer via a “one-stop-shop” or single point of contact. Participants described education (for GPs, patients, and carers), allied health support, legal assistance, and a key worker as the most important services a new memory clinic should be easily accessible and offer culturally sensitive services. Findings have been integrated into the design of the model of care, which will be finalised via a Delphi method-guided expert panel discussion. By co-creating the model of care, the memory clinic will cater holistically for the local region’s needs.

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Research tools to determine whether pericyte dysfunction alters Alzheimer’s disease progression

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Pericytes are contractile cells exclusively residing within the basement membrane of capillaries. These cells control cerebral blood flow (CBF) and energy supply, maintain the blood-brain barrier (BBB) and mediate beta amyloid clearance. An emerging pathological mechanism of Alzheimer’s disease (AD) is the development of vascular dysfunction leading to chronic hypoperfusion, disruption of the BBB and altered beta amyloid clearance. These symptoms are all, in part, controlled by pericytes. Therefore, the degeneration of pericytes may be critical to the development of AD and could represent a novel cellular target for AD therapy. To investigate this, a number of tools need to be developed including human staining for pericytes, transgenic pericyte mice and pericyte depletion models. To establish a link between pericyte loss and human AD pathology, we are collaborating with the University of Oxford to stain AD brain tissue from the OPTIMA cohort of AD patients. Our preliminary staining of human brain sections shows that pericytes can be observed and pericyte coverage calculated. We have characterised a transgenic mouse line, NG2-DsRed mice, that express fluorescent pericytes. Pericytes in NG2-DsRed mice can be identified and quantified using live two-photon imaging and confocal imaging of their brain sections alongside vascular markers. In addition, we have developed methods to directly deplete pericytes pharmacologically which will allow us to determine how pericytes alter AD progression. These research tools will enable us to uncover the importance of pericyte degeneration to AD pathology and whether pericytes represent a viable therapeutic target for AD.

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Multiple neuronal pathologies are common in young patients with pathologically proven Frontotemporal lobar degeneration

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The past decade has seen a surge in studies identifying mixed pathologies in elderly populations. Importantly however, few studies have focused on mixed pathology in Frontotemporal Lobar Degeneration (FTLD), particularly in younger cases. The present study examined concomitant pathological neuronal inclusions of TDP-43, hyperphosphorylated tau and a-synuclein protein in the anterior cingulate, hippocampus and entorhinal cortex in young (<65 years at death) vs. elderly (>80 years at death) cases with pathologically confirmed FTLD (N = 52) or Alzheimer’s disease (AD) (N = 47). Our results demonstrate the presence of additional neuronal pathologies not associated with the primary pathological diagnosis in a similar proportion of young and elderly FTLD cases, indicating that disease drivers rather than age are the major risk factors for multiple neuronal pathologies in FTLD. When only sporadic FTLD cases were considered, the proportion of cases with multiple neuronal pathologies across FTLD age cohorts remained similar, indicating that multiple neuronal pathologies in young FTLD cases is not driven by known genetic mutations. In contrast to these findings in FTLD, a significantly greater proportion of elderly compared to young AD cases demonstrated multiple neuronal pathologies, corroborating literature. In summary, the present study reports for the first time that age is not a major risk factor for multiple neuronal pathologies in FTLD. These findings have significant implications for the development of protein-specific biomarkers and treatments for FTLD, and underscore the need for further research to identify the disease factors involved in driving multiple neuronal pathologies in FTLD.

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Can technology be used to deliver home-based exercise for people with dementia?

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Objectives: There is limited evidence falls can be prevented in community-dwelling older people with dementia. Portable technology can provide cost-effective, interactive and individually-tailored exercise programs. This study assessed the feasibility and safety of StandingTall—a tailored, progressive exercise program delivered through tablet-computers.

Methods: Fifteen participants with mild-moderate dementia (age=82±9 years; mean standard deviation [SD]), 47% female) and their carers were assessed at baseline, participated in the 12-week StandingTall program and were reassessed at completion. Feasibility and safety were assessed using the System Usability Scale (SUS; scores=0-100; a priori target=65), Physical Activity Enjoyment Scale (PACES-8; highest score=7), adherence (exercise minutes recorded by StandingTall) and adverse events.

Results: The mean baseline Montreal Cognitive Assessment score was 16±5 and 60% reported falls in the past year. The mean SUS score was 68 for both participants (SD21) and carers (SD16). The mean PACES-8 score was 5.5±1.0. Median (IQR) exercise minutes in week-2, week-7 and week-12 were 33 (21-38), 53 (8-90) and 65 (0-127). In week-2, week-7 and week-12, exercise minutes were recorded by 87%, 73% and 53% of participants and 53% were exercising >100 minutes at week-12. The primary reasons for non-adherence were health-related. One participant fell whilst exercising with no injury sustained.

Conclusions: The StandingTall program reached the usability target and scored well on enjoyment. On average, participants were exercising for more than 60 minutes/week at week-12. The StandingTall program appears feasible and safe for evaluation in a sufficiently powered randomised control trial with falls as the primary outcome in older people with dementia.

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**Exploiting drug-APOE gene interactions in hypertension to preserve cognitive function: The Three City cohort study**

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Background: The objective was to test the hypothesis that antihypertensive drugs have a differential effect on cognition in carriers and non-carriers of the apolipoprotein e4 (APOE4) polymorphism.

Methods: A total of 3,369 participants (median age 74 years, 62% women) in a prospective population-based cohort were followed for 10 years. Exposure to antihypertensive drug use and lipid-lowering drugs was established in the first 2 years. Cognitive function was assessed at baseline, 2, 4, 7 and 10 years with a validated test battery covering global cognition, verbal fluency, immediate visual recognition memory, processing speed, and executive function. Clinically significant change in cognitive function was determined using reliable change indices represented as z-scores and analysed with linear mixed-models.

Results: From 3,369 persons exposed to antihypertensive drugs, 653 were APOE carriers (5.1% homozgyous, 94.9% homozygous) and median follow-up was 5.2 years (interquartile range 3.7 to 8.0). In APOE4 carriers, improved general cognitive function over time was associated with exposure to angiotensin converting enzyme inhibitors ([ACEI] β = .14; 95% CI .06 to .23, p = .001) and angiotensin receptor blockers ([ARB] β = .11; 95% CI .02 to .21, p = .019). Improved verbal fluency was associated with ACEI (β = .11; 95% CI .03 to .20, p = .012).

Conclusions: Flarin-angiotensin-system (RAS) blockade was associated with improved general cognitive function in APOE4 carriers. Findings did not support drugs’ lipoprolifity or ability to cross the blood-brain barrier as potential mechanisms.
Frontotemporal lobar degeneration (FTLD) can result in a decline in behavior, language and motor function. Mealtimes disturbances are a common and significant outcome of FTLD. Disturbances during mealtimes can arise from dysphagia or may occur secondary to behavioral changes such as rapid eating, meal rigidity and altered diet preferences.

Dysphagia is reported in the late stages of Frontotemporal dementia (FTD) and early in the motor subtypes of FTLD. The identification of dysphagia can alert individuals and medical teams to disease progression and provide insight into the nature and spread of underlying neuropathology. Few studies have comprehensively evaluated eating behavior or dysphagia in individuals presenting with FTLD pathology despite the potential impact on medical safety and individual quality of life. Improved understanding of eating behaviors can improve individual care and may enhance diagnostic accuracy.

Aberrant eating behavior and swallowing difficulties are reported in the conditions associated with FTLD neuropathology. The consequences of mealtimes disturbances include health risks associated with increased BMI and aspiration, reduction of an individual’s independence and an increase in caregiver stress and burden. Here we review and summarize the literature on increased BMI and aspiration, reduction of an individual’s quality of life. Improved understanding and development of interventions that provides learning and development opportunities for psychology undergraduates and social support for RAC residents; and 3. RAC Staff. It investigates the association between contact (positive or negative) with RAC residents and workers and behavioral intentions towards RAC. Further, whether such associations are mediated by trust, independence and perceptions of RAC workers. Study 1: public (N = 373) perception revealed that positive contact with RAC residents and workers was associated with decreased resistance towards entering RAC, while negative contact was strongly associated with increased resistance. Study 2: students (N = 141) also revealed a similar pattern. Study 3: RAC workers (N = 38) demonstrated an overall less resistance to enter RAC, which was mediated by education level and occupational status. Those with more education and higher occupational positions were less likely to have high levels of resistance. Implications for the RAC industry suggest that the public hold pervasive future behavioural intentions towards RAC in line with Allport’s theory of contact. In contrast, the GNP revealed that many extreme attitudes towards RAC did not weaken with increased contact and many staff revealed extreme resistance towards RAC, despite having high levels of contact. Overall, the results suggest that although positive contact may dampen resistance, it does not appear to dissolve our negative evaluation of RAC and essentially influences our future behavioural intentions.

This research evaluates attitudes towards entering residential aged care (RAC) from three angles: 1. The public’s perceptions; 2. The Good Neighbour Program (GNP), an intergenerational pilot intervention that provides learning and development opportunities for psychology undergraduates and social support for RAC residents; and 3. RAC Staff. It investigates the association between contact (positive or negative) with RAC residents and workers and behavioral intentions towards RAC. Further, whether such associations are mediated by trust, independence and perceptions of RAC workers. Study 1: public (N = 373) perception revealed that positive contact with RAC residents and workers was associated with decreased resistance towards entering RAC, while negative contact was strongly associated with increased resistance. Study 2: students (N = 141) also revealed a similar pattern. Study 3: RAC workers (N = 38) demonstrated an overall less resistance to enter RAC, which was mediated by education level and occupational status. Those with more education and higher occupational positions were less likely to have high levels of resistance. Implications for the RAC industry suggest that the public hold pervasive future behavioural intentions towards RAC in line with Allport’s theory of contact. In contrast, the GNP revealed that many extreme attitudes towards RAC did not weaken with increased contact and many staff revealed extreme resistance towards RAC, despite having high levels of contact. Overall, the results suggest that although positive contact may dampen resistance, it does not appear to dissolve our negative evaluation of RAC and essentially influences our future behavioural intentions.

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Attitudes towards Residential Aged Care: a contact theory approach
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This research evaluates attitudes towards entering residential aged care (RAC) from three angles: 1. The public’s perceptions; 2. The Good Neighbour Program (GNP), an intergenerational pilot intervention that provides learning and development opportunities for psychology undergraduates and social support for RAC residents; and 3. RAC Staff. It investigates the association between contact (positive or negative) with RAC residents and workers and behavioural intentions towards RAC. Further, whether such associations are mediated by trust, independence and perceptions of RAC workers. Study 1: public (N = 373) perception revealed that positive contact with RAC residents and workers was associated with decreased resistance towards entering RAC, while negative contact was strongly associated with increased resistance. Study 2: students (N = 141) also revealed a similar pattern. Study 3: RAC workers (N = 38) demonstrated an overall less resistance to enter RAC, which was mediated by education level and occupational status. Those with more education and higher occupational positions were less likely to have high levels of resistance. Implications for the RAC industry suggest that the public hold pervasive future behavioural intentions towards RAC in line with Allport’s theory of contact. In contrast, the GNP revealed that many extreme attitudes towards RAC did not weaken with increased contact and many staff revealed extreme resistance towards RAC, despite having high levels of contact. Overall, the results suggest that although positive contact may dampen resistance, it does not appear to dissolve our negative evaluation of RAC and essentially influences our future behavioural intentions.

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A comparison of rates of mortality with dementia between Indigenous and non-Indigenous Australians
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Background. Dementia is considered a major health problem in Indigenous Australians. This collaborative research work between epidemiologists and cognitive scientists used population level data to quantify differences in rates, types and age of dementia mortality between Indigenous and non-Indigenous Australians.

Methods. We used death certificate data for all Australian individuals over the age of 40 with any mention of dementia (including Alzheimer’s disease and vascular dementia) as the underlying or an associated cause of death for 2006–2014. Death rates were compared using Poisson regression.

Findings. The age-adjusted rates of mortality with dementia were 2.2 times higher in Indigenous compared to non-Indigenous groups. These differences were especially pronounced in those aged less than 75 years, with the rates more than three times higher in the Indigenous compared to the non-Indigenous group. Across all age-groups Indigenous Australians who died with dementia were more likely to have dementia coded as ‘Unspecified’ and less likely to have ‘Alzheimer’s disease’ recorded, compared to non-Indigenous groups. Rates of death with Alzheimer’s disease were overall lower among Indigenous Australians, especially over the age of 75.

Interpretation. Although deaths with dementia are most common at older ages, at ages below 75, Indigenous groups appear to be at considerably higher risk of mortality with dementia compared to the non-Indigenous population. Research is needed into possible differences in aetiology of dementia that might explain the differences in age profile.

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Insomnia symptoms, short sleep duration and sleep medication use associate with lower cognitive function in healthy older adults
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Aims: Increasing evidence suggests that sleep disorders are potentially modifiable risk factors for dementia. This study examined associations between self-reported sleep characteristics and cognition in dementia-free older adults participating in the Aspirin in Reducing Events in the Elderly (ASPREE) study.

Methods: ASPREE is a randomised controlled trial of low-dose aspirin, formed as a collaboration between Australian and US investigators. Recruitment, made possible through partnerships with GP co-investigators across South-Eastern Australia, resulted in a well characterised cohort of 16,703, all aged 70+. Participants completed the Modified Mini-mental State Examination (3MS; score out of 100), Hopkins Verbal Learning Test Revised (HVLT-R; score out of 12), Symbol Digit Modalities Test (SDMT; median score of 371), and Controlled Oral Word Association Test (COWAT-F; median score of 12), and within three months 14, 982 participants (89%) completed further questions, including on sleep characteristics. Multivariable regression analyses allowed adjustment for age, education and gender.

Results: Short sleep, early morning awakening and sleep medication use were associated, respectively, with lower scores (all p<0.05) on 3MS of 0.53 (C1:0.36,0.70), 0.38 (C1:0.21,0.56) & 0.45 (C1:0.19,0.71), on SDMT of 0.48 (C1:0.13,0.84), 0.39 (C1:0.01,0.77) & 1.69 (C1:1.13,2.23) and on COWAT-F of 0.31 (C1:0.14,0.49) & 0.21 (C1:0.03,0.40) (but not for sleep medication use). Similar associations were also found for HVLT-R.

Conclusions: Even in a healthy population, insomnia symptoms, sleep duration and sleep medication use associate with small reductions in cognitive test scores. Longitudinal follow-up will determine whether these symptoms predict clinically significant cognitive outcomes.
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Purpose: Behavioural and psychological symptoms are distressing for people with dementia impacting their ability to interact effectively in the aged care setting. Management strategies when appropriately selected can facilitate participation and inclusion of people with dementia. This study investigates the relationship between nurse understanding of agitation and the management strategies selected to reduce behaviour.

Methods: Semi-structured interviews were conducted at six aged care facilities in Sydney with nursing staff (n=11) as a component of a larger study. The interview questions were constructed from limitations in the literature; they explored nurse perception of agitation and its relationship to dementia, the types of agitation management strategies used at the facilities, characteristics that influence nurse selection of a strategy to reduce agitation behaviour. A content analysis organised data according to key codes and themes.

Results: Nurses reported agitation management to be challenging (72%) in residents with dementia. The behaviour of wandering (64%) and restlessness (64%) were considered intractable to the dementia condition. Impaired ability to communicate causative factors (65%) or comprehend instruction (65%) influenced strategy selection. Short-term management strategies of distraction (91%) and medication (54%) were reported more frequently for people with dementia, and preference-based care a more commonly reported strategy for people without dementia. The behaviour of agitation (54%) was consistently managed by providing space (64%) for residents with and without dementia.

Conclusion: Nurses perceptions that agitation is intractable in the dementia trajectory led to a difference in management approaches provided to older people dependent on dementia diagnosis and communication ability.

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Lavender (Lavandula Angustifolia) and Lemon Balm (Melissa Officinalis) essential oil for the treatment of agitated behaviour

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Background: Behavioural and psychological symptoms can impact a person’s self-esteem, ability to engage and can lead to social isolation, better manages are needed. This study compared the effectiveness of Lavender and Lemon Balm essential oil on agitated behaviours of people with and without dementia.

Methods: A randomised controlled trial was conducted at six aged care facilities in Sydney with forty-nine residents, with dementia (N=39) and without dementia (N=10) that had a history of agitation. Residents were randomly allocated to a treatment sequence of Lavender, Lemon Balm and Placebo sunflower oil. The oils were applied to the resident’s collar daily for two-weeks followed by a washout period. All participants trialed all three treatments over a 10-week period. Data were collected on the Neuropsychiatric Inventory (NPI) and Cohen-Mansfield Agitation Inventory (CMAI) before and after each treatment cycle.

Results: A significant difference in essential oil effect was reported when residents with and without dementia were compared. A higher analysis revealed Lavender more effective in reducing CMAI physical non-aggressive behaviour (p=0.04) and Lemon Balm less effective in reducing NPI irritability (p=0.03) in residents with dementia. Lemon Balm was more effective in reducing NPI agitation (p=0.02) and CMAI physical non-aggressive behaviour (p=0.02) in residents without dementia. Lavender or Lemon Balm did not reduce the frequency of behaviour independent of cognitive status when compared to placebo.

Conclusion: The findings support an opposing effect of the essential oils with Lavender more effective in reducing physical non-aggressive behaviours compared to Lemon Balm and placebo in residents with dementia.

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The therapeutic potential of cannabidiol (CBD) in transgenic mouse models of Alzheimer’s disease

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Alzheimer’s disease (AD) is characterised by the accumulation of amyloid-β (Aβ) and tau hyperphosphorylation causing neurodegeneration, neuroinflammation and oxidative stress. Current AD treatments do not stop or reverse the disease progression, highlighting the need for more effective therapeutic alternatives. The phytocannabinoid cannabidiol (CBD) has demonstrated anti-oxidant, anti-inflammatory, and neuroprotective properties. Furthermore, our previous work found chronic CBD treatment (20 mg/kg) to reverse some behaviour memory deficits and to have subtle effects on neuroinflammatory markers in an AD mouse model (i.e., APPxPS1 transgenic mice). Here, we determined the chronic effects of 50 mg/kg CBD in APPxPS1 and Tau58/2 transgenic mouse models for AD. Male APPxPS1 at 12 months and Tau58/2 mice at 3 months of age were treated with vehicle or CBD (50 mg/kg, daily intraperitoneal injections) starting 3 weeks prior to behavioural testing. Social recognition memory, spatial memory, and fear-associated memory as well as motor function were evaluated following the initial treatment period. After testing, brain tissue was collected for analysis of AD relevant brain pathology. In male APPxPS1 mice CBD treatment reversed a social recognition memory deficit and tended to reduce insoluble Aβ40 levels in the hippocampus. Tau58/2 mice did not exhibit impairments in social recognition or fear associated memory and CBD treatment did not restore motor deficits characteristic for this mouse model.

This study was completed with older age (OR=1.09, CI=1-1.2), fewer years of education (OR=0.77, CI=0.6-0.9), cortical stroke (OR=3.93, CI=1.4-1.44) and hypertension (OR=6.9, CI=1.5-3.2). The results were unchanged after adjustments for infarct volume and prior stroke.

Conclusions: Several factors contribute to the cognitive profile 12 months after ischaemic stroke.

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Factors associated with cognitive impairment 12 months after ischaemic stroke

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Background — Cognitive decline and dementia are common after stroke, but risk factors for post-stroke cognitive impairment are yet to be defined. Our aim was to identify individual and stroke-related factors associated with cognitive impairment 12 months after ischaemic stroke.

Methods — In the Cognition And Neocortical Volume After Stroke (CANVAS) study, we recruited ischaemic stroke patients of all types from three hospitals in Melbourne. Seven cognitive domains were assessed at 12-months post-stroke. 2 scores were calculated using appropriate norms. Impairments were defined as z-scores < 1.5 SDs. We used odds ratios (ORs) with 95% confidence intervals (CI) to examine associations between individual (e.g., demographic, vascular risk) and stroke-related (e.g., severity, site) factors and the presence of multi-domain impairment (i.e., impairment in ≥2 cognitive domains).

Results — 109 stroke patients (median age=70 years [Q1=63, Q3=76]; sex=75(69%) men; median education=12 years [Q1=10, Q3=15]) completed 12-month reviews. Strokes were typically mild (median NIHSS 0-7=103(95%)). There were 44(40%) left- and 62(57%) right-sided strokes, 39(36%) posterior and 55(59%) anterior circulation strokes; and 65(60%) subcortical and 29(27%) cortical strokes. Pre-existing hypertension (85(60%), hypercholesterolaemia (49(45%)), and type ii diabetes mellitus (22(20%)), were common. Eighteen (18%) patients had multi-domain impairment.

This profile was associated with older age (OR=1.09, CI=1-1.2), fewer years of education (OR=0.77, CI=0.6-0.9), cortical stroke (OR=3.93, CI=1.4-1.44) and hypertension (OR=6.9, CI=1.5-3.2). The results were unchanged after adjustments for infarct volume and prior stroke.

Conclusions — Several factors contribute to the cognitive profile 12 months after ischaemic stroke. Hypertension may be an important risk factor for post-stroke cognitive impairment.
Apathy and its impact on carer burden and wellbeing in primary progressive aphasias

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Language impairment is the core clinical feature of primary progressive aphasia (PPA). Clinically, however, PPA patients also appear to present with non-cognitive behavioural symptoms, such as apathy, although systematic investigations are scant. Here, we aimed to systematically examine apathy across the three recognised subtypes of PPA and evaluate its influence on carer burden and psychological wellbeing. One hundred and thirteen PPA patients were included: 39 left semantic-variant PPA (svPPA), 16 right svPPA, 30 nonfluent variant PPA (nvPPA) and 37 logopenic variant PPA (nvPPA). Informants completed the Neuropsychiatric Inventory (NPI), Cambridge Behavioural Inventory (CBI) and Frontal Systems Behaviour Scale (FRSBE) to quantify symptoms of apathy, and the Zarit Burden Interview and Depression, Anxiety and Stress Scale, to determine carer burden and psychological wellbeing. On the NPI, symptoms of apathy were reported in 40% left svPPA, 56% right svPPA, 33% nvPPA and 43% lvPPA patients. Controlling for language functions, symptoms of apathy were more severe in right svPPA compared to lvPPA and npvPPA. Notably, despite the higher frequency and severity of apathy in right svPPA patients, symptoms of apathy were associated with higher burden and lower wellbeing in the carers of left svPPA, nvPPA and lvPPA patients. Our results reveal that apathy is remarkably common in PPA, although the severity of apathy varies across PPA subtypes. Moreover, these symptoms differentially impact on carers of patients depending on the PPA syndrome. As such, carer psychoeducation which addresses non-cognitive behavioural symptoms may be beneficial in improving burden and wellbeing.

Introduction: Cognitive disturbances detrimentally impact Parkinson’s disease (PD) patient’s quality of life and contributes to a high disease burden. Mild cognitive impairment (MCI) is common in PD and is a prodromal state of dementia. PD-MCI is a strong predictor of developing dementia therefore it is crucial to explore and understand the specific neurobiological changes associated with PD-MCI. This study aimed to investigate brain connectivity associated with PD-MCI during resting state functional MRI.

Method: 17 PD-MCI, 12 PD patients without MCI (non-MCI) and 17 healthy controls were scanned (7T Siemens PRISMA). Seed-based functional connectivity analysis was performed between groups to identify altered connectivity of seeds in the default mode networks such as medial prefrontal cortex (MPFC), bilateral parietal cortex (LPI and posterior cingulate cortex (PCC) compared to other regions.

Results: MPFC and bilateral frontal pole demonstrated greater connectivity in PD compared to healthy controls. Particularly, PCC and the right frontal pole showed greater connectivity in PD-MCI compared to PD non-MCI and healthy controls. Decreased connectivity between MPFC and right inferior temporal gyrus; right LP and right para-hippocampal gyrus; and PCC and right occipital pole were observed between PD-MCI and PD non-MCI.

Discussion: Reduction in functional connectivity was found in PD-MCI. The strengthening of connection with PCC is indicative of a lack of ability to disconnect this region when needed. Altered functional connectivity in the default mode network may correlate with cognitive burden in PD-MCI. Our results extend understanding of the neurobiology of pre-clinical dementia in PD.
Methods: 218 participants underwent PET, MRI and cognitive assessment at 18-month intervals as part of the AIBL Study. MRI images were reviewed for cortical microinfarcts, large cortical infarcts, and lacunes. White-matter hyperintensity (WMH) and hippocampal volume were quantified automatically. A binary CeVD classification was derived, with participants classified V+ if they had ≥1 brain infarct and/or WMH>90th centile compared to CN subjects. AB+ was defined on PET as SUVR/BeCKeT>1.4. Cognition was assessed using the pre-clinical AD composite. Linear mixed models were conducted comparing change in cognition and hippocampal volume between the resultant groups (AB-/V-, AB-/V+, AB+/V-, AB+/V+), adjusting for age, sex and CN/MCI/AD category.

Results: Mean age at baseline was 74 yrs. Clinical diagnosis at baseline was CN(115), MCI(54) and AD(49). Compared to AB-/V- and AB-/V+, the AB+/V- and AB+/V+ groups showed significantly faster cognitive decline and hippocampal atrophy. The AB+/V- group demonstrated significantly greater cognitive decline and hippocampal atrophy than the AB+/V+ group. There was no difference in cognitive trajectory or hippocampal atrophy between AB-/V- and AB-/V+.

Conclusions: CeVD increased the rate of cognitive decline and neurodegeneration in AB+ patients. Further results will be presented at ADF.

The Health Care Home (HCH): will it just end in tiers

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The HCH model of care aims to improve health outcomes by funding integrated and coordinated primary care services for patients with chronic conditions based on tiers of complexity. It is known that the existing primary care model does not meet the needs of people living with dementia (PLWD) and their support persons (SP). As stated in the World Alzheimer Report 2016: dementia is under-detected, under-diagnosed, under-disclosed, under-treated and under-managed in primary care.

Now’s the time, when the HCH is being trialled, to ask: will this model of primary care better meet the needs of PLWD and SPs? The use of the HARP risk assessment tool to stratify patients to determine the level of complexity and funding allocation is concerning. This tool considers dementia as an additive factor to complexity, in the same category as falls or incontinence, when in fact dementia is a multiplier of complexity. Will emerging cognitive impairment, with no other co-morbidity, be considered of low complexity with an according low allocation of resources? In reality this is a time when intensive support is vital. How will SPs, with their complex health care needs be considered? Are the projected allocation of resources required to support the HCH with a projected 20% of the population being eligible adequate? Dementia is underrepresented in the hospital data sets, primary care records and population data used to project these numbers.

This poster will summarise the proposed HCH model and identify key issues for discussion and debate when considering PLWD and their SP.