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Understanding risk and preventing falls and functional decline in older people with cognitive impairment

CDPC Activity 19: Final Report

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Executive Summary

With population ageing, the number of people living with dementia is increasing rapidly which has significant health, societal and economic impacts. Older people with dementia fall more frequently and are often physically frailer than cognitively healthy older people. Falls in people with dementia are more likely to result in injury, functional impairment, death and placement in residential care when compared to cognitively healthy older people. Currently, there is limited evidence falls can be prevented in community-dwelling older people with dementia. Understanding the mechanisms associated with falls in this population may assist in developing effective prevention strategies.

The work undertaken as part of this activity has identified several novel fall risk factors in this population e.g. white matter hyperintensities volume and inaccurate judgement of reaching ability. We have demonstrated that executive function, compared to other cognitive domains, has the strongest association with falls and this relationship is mediated by reaction time and balance. Individuals with dementia and poorer executive function, were less active and had physical impairments when compared to individuals with dementia and better executive function. These findings highlight potential fall risk assessment strategies, as well as opportunities for targeted interventions.

Cognitive decline is the hallmark feature of dementia, but physical and functional impairments are also common and not as well described. In cognitively healthy older people, slow walking speed has been shown to identify individuals' who will decline cognitively and develop dementia. However, this relationship has not previously been studied in people with dementia. We investigated one-year decline in community-dwelling older people with dementia and showed multi-domain cognitive and physical decline and an association between baseline gait speed and decline in executive function. These findings highlight the close relationship between cognitive and physical performance, probable shared brain networks and the utility of walking speed as a potential maker for cognitive decline.

Exercise based interventions have the potential to improve physical, cognitive and psychological related fall risk factors in community-dwelling older people with dementia. We investigated a 6-month, carer-enhanced, home-based exercise program for people with dementia. After 6-months of exercise, people with dementia had improved balance, increased planned physical activity and had reduced their concern about falls. Greater participation in the exercise program resulted in better balance performance. However, adherence was suboptimal, which is common in exercise interventions. Innovative and engaging strategies are needed. Therefore, we examined the feasibility of using iPads to deliver a 12-week, home-based, carer supervised, tailored and progressive exercise program (StandingTall). StandingTall scored well on enjoyment, had acceptable usability and seemed feasible for older people with dementia and their carers. On average, participants were exercising for 65 minutes in week-12. StandingTall needs testing in a larger trial to establish whether this program can reduce falls and fall-related risk factors.

Dual task activities (doing two things at the same time) are common in everyday life. Older people with dementia often have reduced dual task capabilities compared to cognitively healthy older people. Reduced dual task walking ability has been associated with falls in people with and without dementia. We are currently assessing the feasibility of older people with dementia undertaking a home-based dual task stepping and walking exercise program with carer supervision. This trial is currently underway with five of twenty participants recruited.

Poorer cognitive performance has been shown to increase falls risk in people with and without dementia. Therefore, cognitive exercise is a potential fall prevention strategy. We are conducting a randomised controlled trial of home-based cognitive exercise in 80 older people with dementia. The cognitive exercise is based on video games aimed at training cognitive speed, attention, working memory, visuospatial ability, dual tasking and inhibition. So far, we have recruited 47 of the 80 required participants.

Activity 19 has added considerably to the literature examining physical and cognitive disability and falls in community-dwelling older people with dementia. These studies have highlighted potential fall risk assessment strategies, as well as opportunities for targeted interventions. Activity 19 has also provided better understanding of how physical and cognitive functions interact with falls and decline. In relation to interventions, we have trialled/are trialling new approaches aimed at reducing disability and preventing falls. A home based exercise program improved balance and concern about falls, both known fall risk factors. StandingTalls' (an exercise program delivered using tablet computers) feasibility was established and a larger trial is needed to ascertain whether the program prevents falls in people with dementia. The completion and outcomes from the two ongoing intervention trials (dual task walking and stepping and randomised controlled trial of cognitive exercise will determine what the next steps are in relation to these treatments.

Acknowledgements

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Background

Falls are common in older people with dementia, with more than 60% of those living at home falling annually. Falls in people with dementia are more likely to result in injury (e.g. 2-3-fold risk of hip fracture, 2-fold risk of head injury), functional decline, loss of independence and placement in residential care. The associated societal, health and economic costs are substantial.

So far, there is limited evidence falls can be prevented in community-dwelling older people with dementia. Therefore, understanding the complex relationships between cognitive and physical function, decline and falls will assist in devising effective fall and decline prevention strategies. Preventing falls and physical decline has several potential benefits, including, but not limited to maintaining independence, lower rates of injury, fewer hospitalisations and transfers to residential care and improvements in quality of life.

Older people with dementia tend to have poorer physical performance when compared to their cognitively healthy peers. Previous studies from this research group have demonstrated that impairments in strength, balance, functional performance and reaction time are associated with an increased risk of falls. Exercise has been shown to have a positive impact on physical performance e.g. balance, function and strength. However, the evidence for exercise as a fall prevention intervention is less clear. Exercise based interventions have the potential to improve physical, cognitive and psychological related fall risk factors, in particular balance and mood. Activity 19 aimed to examine the effect of regular exercise on physical performance in people with dementia, as well as examine the feasibility of using technology to deliver a home-based, progressive, and tailored exercise program over 12-weeks.

The evidence for cognitive training in people with dementia is inconclusive. Preliminary research has suggested that multimodal interventions, combining exercise and cognitive tasks, can improve both physical and cognitive performance. So far, little work has been conducted examining the effect of cognitive training on ADLs, balance and falls and multimodal training has not been tested in isolation or in the home environment using carer supervision. Activity 19 aimed to examine the effect of home-based cognitive training on cognitive and physical performance. We also aimed to determine if home-based, carer supervised, dual task walking and stepping training is feasible for older people with dementia and their carers.

There is a pressing need to explore interventions aimed at preserving function and maintaining independence in people with dementia, ultimately allowing them to continue living at home. Evidence-based strategies to prevent falls in people with dementia are lacking, yet the potential benefits are substantial for the person, their family and health care systems.

Introduction

The aim of this CDPC project was to examine the complex relationship between cognition, physical function, decline and falls. This will assist in determining future interventions in this population. This project also provides evidence for novel prevention strategies aimed at reducing falls and maintaining cognitive and physical function.

Over the three-year funding period the objectives of this activity were to:

1. Improve understanding of the relationship between cognitive and physical function and fall risk in older people with cognitive impairment
2. Investigate the relationship between falls and both cognitive and physical decline over time in people with cognitive impairment
3. Investigate new and novel approaches to fall prevention in dementia e.g. cognitive training, combination cognitive and exercise interventions and tailored exercise and home hazard reduction interventions

Method

Objective 1 & 2 used data from a completed prospective fall risk factor study in cognitively impaired older people (n=177). This data was used to examine the relationship between cognitive and physical performance and falls, as well as longitudinal decline in older people with cognitive impairment. Decline was further examined using data from the Sydney Memory and Ageing Study together with the study described above. In this cohort of 593 people, 342 (58%) were cognitively normal, 77 (13%) were diagnosed with Mild Cognitive Impairment (MCI) and 174 (29%) were people with dementia. Four hundred and ninety participants were available for follow-up at 1-year, of which 301 (61%) were CN and 60 (12%) were diagnosed with MCI and 129 (26%) with dementia.

Objective 3 used/will use data from several studies, some complete and others ongoing. Forty-two community-dwelling older people with mild to moderate dementia were recruited and participated in a pre/post trial of a six-month, home-based, carer assisted, tailored exercise program. Fifteen community-dwelling older people with dementia participated in a feasibility trial of a tailored, progressive, home-based exercise program delivered using a tablet computer (StandingTall). Two trials are still recruiting, one is a randomised controlled trial of cognitive exercise using video games in 80 community-dwelling older people with dementia and the other is a feasibility trial of dual task stepping and walking in 20 community-dwelling older people with dementia.

Project findings

Objective 1: Improve our understanding of the relationship between cognitive and physical function and fall risk in older people with cognitive impairment

Key findings:

- a) Executive function (the set of higher-order processes, such as inhibitory control, working memory, attention, flexibility, planning and problem solving, that govern goal-directed action and adaptive responses), when compared to other cognitive domains e.g. memory and processing speed, had the strongest association with falls in older people with dementia

- b) Older people with dementia and executive dysfunction had poorer physical function (e.g. strength and balance) and were less active than participants with better executive function
- c) The relationship between executive function and falls is mediated by reaction time and postural sway (balance) in older people with dementia
- d) Total, periventricular (near the ventricles of the brain) and deep white matter hyperintensities (WMH) volumes were each associated with falls during 12-months follow-up in older people with dementia
- e) Total WMH volume was significantly associated with physical and global cognitive function at baseline
- f) Inaccurate judgement of reaching ability (i.e. discrepancy between actual reach ability and perceived reach ability) was associated with an increased risk of falls in older people with dementia. This relationship withstood adjustment for other known fall risk factors – balance and executive and global cognitive function. The relationship between reach judgement error and falls was based on the absolute magnitude of error i.e. not the direction of the judgement error (not based on over- or under-estimation)

Outputs addressing objective one:

Publications

Taylor ME, Butler AA, Lord SR, Delbaere K, Kurrle SE, Mikolaizak AS, Close JCT. Inaccurate judgement of reach is associated with slow reaction time, poor balance, impaired executive function and predicts prospective falls in older people with cognitive impairment. *Exp Gerontol*. 2018; 144:50-56. doi.org/10.1016/j.exger.2018.10.020

Taylor ME, Lord SR, Delbaere K, Wen W, Jiang J, Brodaty H, Kurrle SE, Mikolaizak AS, Close JCT. White matter hyperintensities are associated with falls in older people with dementia. *Brain Imaging Behav*. 2018. doi:10.1007/s11682-018-9943-8

Taylor ME, Lord SR, Delbaere K, Kurrle SE, Mikolaizak AS, Close JCT. Reaction time and postural sway modify the effect of executive function on risk of falls in older people with mild to moderate cognitive impairment. *Am J Geriatr Psychiatry*. 2017; 25:397-406. doi:10.1016/j.jagp.2016.10.010.

Conference and invited presentations

The relationship between white matter hyperintensity clusters (size and location) and prospective falls in older adults across the cognitive spectrum (Taylor ME, Delbaere K, Lord SR, Sachdev PS, Wen W, Jiang J, Brodaty H, Kurrle SE, Sturnieks D, Troller J, Close JCT), oral abstract, First International Motor Impairment Conference, Sydney, November 2018

White matter hyperintensity volume predicts prospective falls in older people with dementia (Taylor ME, Lord SR, Delbaere K, Wen W, Jiang J, Brodaty H, Kurrle SE, Mikolaizak AS, Close JCT), oral abstract, ANZFPS Conference, Hobart, November 2018

Inaccurate judgement of reach is associated with slow reaction time, poor balance, executive dysfunction and prospective falls in older people with mild to moderate dementia (Taylor ME, Butler AA, Lord SR, Delbaere K, Kurrle SE, Mikolaizak AS, Close JCT), oral abstract, Australian and New Zealand Society of Geriatric Medicine Annual Scientific Meeting, Rotorua, New Zealand, June 2017

Is executive function associated with falls in older people with cognitive impairment? (Taylor ME, Lord SR, Delbaere K, Mikolaizak AS, Close JC), invited speaker, Ageing and Neurodegeneration Theme Meeting (Neuroscience Research Australia), Sydney, August 2016

Relationships between executive function, physiological performance, medication use and falls in older people with cognitive impairment (Taylor ME, Lord SR, Delbaere K, Kurrle S, Mikolaizak AS, Close JCT), oral abstract, Australia and New Zealand Society of Geriatric Medicine Annual Scientific Meeting, Cairns, June 2016

Objective 2: Investigate the relationship between falls and both cognitive and physical decline over time in people with cognitive impairment

Key findings:

- a) Older people with dementia demonstrate significant cognitive and physical decline over one-year
- b) Baseline gait speed is associated with decline in executive function over one year and may be a marker for those at risk of cognitive decline and in need of targeted interventions in older people with dementia
- c) Having mild cognitive impairment (MCI) or dementia is associated with greater physical decline over one-year compared to cognitively intact older people
- d) Physical inactivity and executive dysfunction were associated with physical decline in a large sample of older people that included participants with MCI and dementia
- e) Physical decline over one year was associated with falls during the same timeframe. This relationship was independent of age, number of medications, education, baseline physical performance, executive dysfunction and physical inactivity.

Outputs addressing objective two:

Publications

Taylor ME, Boripuntakul S, Toson B, et al. The role of cognitive function and physical activity in physical decline in older adults across the cognitive spectrum. *Aging Ment Health*. 2018;1-9. doi:10.1080/13607863.2018.1474446

Taylor ME, Lasschuit DA, Lord SR, et al. Slow gait speed is associated with executive function decline in older people with mild to moderate dementia: A one year longitudinal study. *Arch Gerontol Geriatr*. 2017;73:148-153. doi:10.1016/j.archger.2017.07.023.

Conference and invited presentations

Both executive dysfunction and physical inactivity influence physical decline in older adults across the cognitive spectrum (Taylor ME, Boripuntakul S, Toson B, Close JCT, Lord SR, Kochan NA, Sachdev PS, Brodaty H, Delbaere K), oral abstract, Alzheimer's Disease International Conference, Chicago, July 2018

The role of cognitive function and physical activity in physical decline in older adults (Taylor ME, Boripuntakul S, Toson B, Close JCT, Lord SR, Kochan NA, Sachdev PS, Brodaty H, Delbaere K), invited speaker, Sensorimotor Control Seminar Series (Neuroscience Research Australia), Sydney, April 2018

Slow gait speed is associated with executive function decline in older people with mild to moderate dementia: A one-year longitudinal study (Taylor ME [Invited speaker], Lasschuit D, Lord SR, Delbaere

K, Kurrle SE, Mikolaizak AS, Kvelde T, Close JCT), Australian Dementia Forum – Cognitive Decline Partnership session, Melbourne, October 2017

Longitudinal study of falls and physical and cognitive performance in older people with mild to moderate dementia (Taylor ME, Lasschuit D, Lord SR, Delbaere K, Mikolaizak AS, Kvelde T, Close JCT), oral abstract, 7th Biennial Australian and New Zealand Falls Prevention Conference, Melbourne, November 2016

Objective 3: Investigate new and novel approaches to fall prevention in dementia e.g. cognitive training, combination cognitive and exercise interventions and tailored exercise and home hazard reduction interventions

Key findings:

- A 6-month home-based, tailored and progressive exercise program that engaged caregivers to assist in exercise supervision improved balance, concern about falls and planned physical activity in community-dwelling older people with dementia.
- Better ($\geq 70\%$) adherence to a 6-month home-based, tailored and progressive exercise program resulted in better balance outcomes in older people with dementia
- Adherence to the 6-month, home-based, tailored and progressive exercise declined over time. The average adherence to the prescribed exercise sessions was 45% overall and 52% of participants (or 67% of study completers) were still exercising at trial completion
- An exercise program (*StandingTall*) delivered through a tablet computer (iPad) for 12-weeks had acceptable usability, scored well on enjoyment and seemed feasible for older people with dementia and their caregivers
- Adherence to *StandingTall* (delivered using an iPad) was variable, but in week-12, exercise minutes averaged 65 (BCa 95% CI 28, 104) and five participants were exercising >115 minutes
- One participant fell (without sustained injury) while exercising using the *StandingTall* program. A number of safety precautions (e.g. chair nearby, supervision by carer) were in place, but potentially the exercise difficulty was rated inaccurately. Therefore, in any future trials, further training on exercise difficulty rating may be needed.



Outputs addressing objective three:

Publications

Taylor ME, Lord SR, Brodaty H, et al. A home-based, carer-enhanced exercise program improves balance and falls efficacy in community-dwelling older people with dementia. *Int Psychogeriatr*. 2017; 29:81-91. doi:10.1017/S1041610216001629.

Conference and invited presentations

Feasibility of using iPads and the StandingTall app to deliver home-based exercise in older people with dementia (Taylor ME, Delbaere K, Lord SR, Kurrle SE, Webster L, Savage R, Close JCT), oral abstract, ANZFPS Conference, Hobart, November 2018

Can technology be used to deliver home-based exercise for people with dementia? (Taylor ME, Delbaere K, Lord SR, Kurrle SE, Webster L, Savage R, Close JCT), poster, Australian Dementia Forum, Sydney, June 2018

Home-based exercise in older people with dementia: are there benefits and do they adhere? (Taylor ME, Lord SR, Brodaty H, Hamilton S, Ramsay B, Webster L, Payne N, Close JCT), invited speaker, Sensorimotor Control Seminar Series (Neuroscience Research Australia), Sydney, July 2016

Home-based exercise improves balance in older people with dementia (Taylor ME, Lord SR, Brodaty H, Hamilton S, Ramsay B, Webster L, Payne N, Close JCT), invited speaker, NSW Falls Prevention Network Forum, Sydney, May 2016

Conclusion:

Designing interventions to reduce falls in older people with dementia requires an understanding of the relationship between physical and cognitive function, and associated risk factors for falls. An inability to accurately judge physical ability and vascular brain changes (WMH) increase falls risk in this population. So too does poorer executive function, but the relationship between executive function and falls is mediated by physical factors. Over one-year older people with dementia declined in physical and cognitive function and baseline gait speed predicted declines in executive function. Physical inactivity and executive dysfunction were associated with physical decline in a large sample that included older people with MCI and dementia. These findings highlight factors to consider when assessing falls, as well as potential fall and decline treatment opportunities.

Exercise based interventions have the potential to improve physical, cognitive and psychological fall risk factors. A home-based exercise program that is tailored and progressive and utilises carer supervision improved balance and concern about falls. Better adherence to the exercise program resulted in better balance outcomes. However, adherence overall was relatively poor. Innovative, engaging and cost-effective strategies are needed. StandingTall, a tailored and progressive exercise program delivered using an iPad, is feasible for older people with dementia and their carers, but further research is needed to establish if StandingTall can prevent falls in this group.

Progress update of ongoing projects:

- a) iFOCIS (fall prevention: exercise and home hazard reduction) randomised controlled trial (NHMRC funded but aligned with Activity 19)
Status: complete, data analyses and manuscript preparation underway

- Target: n=360
Final: n=309, recruitment completed July 2017, 12-month follow-up completed August 2018
- b) *StandingTall* feasibility trial
Status: trial complete, data analyses and manuscript preparation complete, currently under consideration for a peer-reviewed journal
Target: n=15
Final: n=15
- c) DiCE (home-based cognitive training) randomised controlled trial
Status: recruitment and follow-up ongoing, delayed start secondary to iFOCIS RCT and slow recruitment
Target: n=80
Currently: n=47
- d) Dual task gait and stepping study (home-based, tailored and progressive dual task exercise program)
Status: recruitment and follow-up ongoing, delayed start secondary to DiCE and iFOCIS RCT
Target: n=20
Currently: n=5

Outputs and achievements summary

Book chapters

Taylor ME, Close JCT. Dementia. In: Day BL and Lord SR, (Eds). Balance, Gait, and Falls. San Diego: Elsevier BV, 2018: 303-321.

Delbaere K, Menant J, Taylor M, Lord SR. Human Factors Approach to Understanding and Reducing the Risk of Falls. Falls in older people: Epidemiology, risk factors and assessment. Taylor & Francis Group (in press)

Publications

Taylor ME, Butler AA, Lord SR, Delbaere K, Kurrle SE, Mikolaizak AS, Close JCT. Inaccurate judgement of reach is associated with slow reaction time, poor balance, impaired executive function and predicts prospective falls in older people with cognitive impairment. *Exp Gerontol*. 2018: 144:50-56. doi.org/10.1016/j.exger.2018.10.020

Taylor ME, Lord SR, Delbaere K, Wen W, Jiang J, Brodaty H, Kurrle SE, Mikolaizak AS, Close JCT. White matter hyperintensities are associated with falls in older people with dementia. *Brain Imaging Behav*. 2018. doi:10.1007/s11682-018-9943-8

Taylor ME, Boripuntakul S, Toson B, et al. The role of cognitive function and physical activity in physical decline in older adults across the cognitive spectrum. *Aging Ment Health*. 2018:1-9. doi:10.1080/13607863.2018.1474446

Taylor ME, Lasschuit DA, Lord SR, et al. Slow gait speed is associated with executive function decline in older people with mild to moderate dementia: A one year longitudinal study. *Arch Gerontol Geriatr*. 2017;73:148-153. doi:10.1016/j.archger.2017.07.023.

Taylor ME, Lord SR, Delbaere K, Kurrle SE, Mikolaizak AS, Close JCT. Reaction time and postural sway modify the effect of executive function on risk of falls in older people with mild to moderate cognitive impairment. *Am J Geriatr Psychiatry*. 2017; 25:397-406. doi:10.1016/j.jagp.2016.10.010.

Taylor ME, Lord SR, Brodaty H, et al. A home-based, carer-enhanced exercise program improves balance and falls efficacy in community-dwelling older people with dementia. *Int Psychogeriatr*. 2017; 29:81-91. doi:10.1017/S1041610216001629.

Academic teaching

Dementia Module, Australian Physiotherapy Association Level 2 Gerontology Course, Sydney, November 2018

Masterclass Lecturer (Fall risk and prevention; Taylor ME), Masters of Physiotherapy, UTS, Sydney, May 2018

Dementia, Delirium and Depression Module, Australian Physiotherapy Association Level 1 Gerontology Course, Sydney, August 2017, February 2018, February 2019

Falls in people with dementia (Taylor ME), invited lecture, Masters in Public Health, Falls prevention in the older person elective, The University of Sydney, August 2016

Conference and invited presentations

The relationship between white matter hyperintensity clusters (size and location) and prospective falls in older adults across the cognitive spectrum (Taylor ME, Delbaere K, Lord SR, Sachdev PS, Wen W, Jiang J, Brodaty H, Kurrle SE, Sturnieks D, Troller J, Close JCT), oral abstract, First International Motor Impairment Conference, Sydney, November 2018

White matter hyperintensity volume predicts prospective falls in older people with dementia (Taylor ME, Lord SR, Delbaere K, Wen W, Jiang J, Brodaty H, Kurrle SE, Mikolaizak AS, Close JCT), oral abstract, ANZFPS Conference, Hobart, November 2018

Feasibility of using iPads and the StandingTall app to deliver home-based exercise in older people with dementia (Taylor ME, Delbaere K, Lord SR, Kurrle SE, Webster L, Savage R, Close JCT), oral abstract, ANZFPS Conference, Hobart, November 2018

Multifactorial Fall-Risk Assessment: Cognition and Affect contribute to the prediction of future falls (van Schooten KS, Lord SR, Davis J, Taylor ME, Close JCT, Paul S, Canning C, Latt M, Hoang P, Kochan N, Sachdev P, H Brodaty H, Delbaere K), accepted oral, 8th ANZFPS conference, Hobart, November 2018

Attention/processing speed is a better predictor of fall-related fractures than executive function (Harvey L, Taylor ME, Delbaere K, Lord SR, Brodaty H, Draper B, Kochan N, Sachdev P, Mitchell R, Close JCT), oral abstract, 8th ANZFPS conference, Hobart, November 2018

Is physiotherapy effective for older people with dementia? (Taylor ME), invited speaker, South Eastern Sydney Local District Physiotherapy Research Update, Sydney, October 2018

Fall risk, decline and exercise in older people with dementia (Taylor ME), invited presentation, Cognitive Decline Partnership Centre Annual Conference, Canberra, October 2018

Cognitive impairment and falls (Taylor ME), invited webinar, NSW Falls Network, Sydney, August 2018

Both executive dysfunction and physical inactivity influence physical decline in older adults across the cognitive spectrum (Taylor ME, Boripuntakul S, Toson B, Close JCT, Lord SR, Kochan NA, Sachdev PS, Brodaty H, Delbaere K), oral abstract, Alzheimer's Disease International Conference, Chicago, July 2018

White matter hyperintensities are associated with falls in older people with dementia (Taylor ME, Lord SR, Delbaere K, Wen W, Jiang J, Brodaty H, Kurrle SE, Mikolaizak AS, Close JCT), poster, Alzheimer's Disease International Conference, Chicago, July 2018

Can technology be used to deliver home-based exercise for people with dementia? (Taylor ME, Delbaere K, Lord SR, Kurrle SE, Webster L, Savage R, Close JCT), poster, Australian Dementia Forum, Sydney, June 2018

The role of cognitive function and physical activity in physical decline in older adults (Taylor ME, Boripuntakul S, Toson B, Close JCT, Lord SR, Kochan NA, Sachdev PS, Brodaty H, Delbaere K), invited speaker, Sensorimotor Control Seminar Series (Neuroscience Research Australia), Sydney, April 2018

Falls in older people with dementia (Taylor ME), Invited speaker, Gerontology stream Australian Physiotherapy Association, Sydney, November 2017

Is physiotherapy effective for older people with dementia? (Taylor ME), invited speaker, Australian Physiotherapy Conference, Sydney, October 2017

Slow gait speed is associated with executive function decline in older people with mild to moderate dementia: A one-year longitudinal study (Taylor ME [Invited speaker], Lasschuit D, Lord SR, Delbaere K, Kurrle SE, Mikolaizak AS, Kvelde T, Close JCT), Australian Dementia Forum – Cognitive Decline Partnership session, Melbourne, October 2017

Inaccurate judgement of reach is associated with slow reaction time, poor balance, executive dysfunction and prospective falls in older people with mild to moderate dementia (Taylor ME, Butler AA, Lord SR, Delbaere K, Kurrle SE, Mikolaizak AS, Close JCT), oral abstract, Australian and New Zealand Society of Geriatric Medicine Annual Scientific Meeting, Rotorua, New Zealand, June 2017

Longitudinal study of falls and physical and cognitive performance in older people with mild to moderate dementia (Taylor ME, Lasschuit D, Lord SR, Delbaere K, Mikolaizak AS, Kvelde T, Close JCT), oral abstract, 7th Biennial Australian and New Zealand Falls Prevention Conference, Melbourne, November 2016

Feasibility study of a home-based exercise program delivered through a tablet computer (Standing Tall) (Taylor ME, Delbaere K, Kurrle S, Close JCT), Rapid fire presentation and poster, Cognitive Decline Partnership Centre Annual Meeting, Sydney, November 2016

Is executive function associated with falls in older people with cognitive impairment? (Taylor ME, Lord SR, Delbaere K, Mikolaizak AS, Close JC), invited speaker, Ageing and Neurodegeneration Theme Meeting (Neuroscience Research Australia), Sydney, August 2016

Home-based exercise in older people with dementia: are there benefits and do they adhere? (Taylor ME, Lord SR, Brodaty H, Hamilton S, Ramsay B, Webster L, Payne N, Close JCT), invited speaker, Sensorimotor Control Seminar Series (Neuroscience Research Australia), Sydney, July 2016

Relationships between executive function, physiological performance, medication use and falls in older people with cognitive impairment (Taylor ME, Lord SR, Delbaere K, Kurrle S, Mikolaizak AS, Close JCT), oral abstract, Australia and New Zealand Society of Geriatric Medicine Annual Scientific Meeting, Cairns, June 2016

Home-based exercise improves balance in older people with dementia (Taylor ME, Lord SR, Brodaty H, Hamilton S, Ramsay B, Webster L, Payne N, Close JCT), invited speaker, NSW Falls Prevention Network Forum, Sydney, May 2016

Understanding and preventing physical and cognitive decline and falls in older people with dementia (Taylor ME, Lord SR, Kurrle S, Close JCT), Rapid fire presentation and poster, NNIDR Symposium, Brisbane, May 2016

Dementia and Falls (Taylor ME), invited speaker, Australian Faculty of Rehabilitation Medicine, Royal College of Physicians, Sydney, February 2016

Prevention of Falls in Alzheimer's Disease (Sherrington C [speaker], Taylor ME), 9^o Congresso Paulista de Geriatria e Gerontologia, Brazil, November 2015