



Research

Additional structured physical activity does not improve walking in older people (> 60 years) undergoing inpatient rehabilitation: a randomised trial

Catherine M Said^{a,b,c}, Meg E Morris^{c,d}, Jennifer L McGinley^b, Cassandra Szoeki^{e,f,g}, Barbara Workman^{h,i}, Danny Liew^j, Keith D Hill^k, Michael Woodward^{l,m}, Joanne E Wittwer^c, Leonid Churilov^{n,o}, Mary Danoudis^c, Julie Bernhardt^{c,p}

^a Physiotherapy Department, Austin Health, Melbourne; ^b Physiotherapy, Melbourne School of Health Sciences, The University of Melbourne; ^c La Trobe Centre for Exercise and Sports Medicine Research, School of Allied Health, La Trobe University, Melbourne; ^d Northpark Private Hospital, Healthscope Australia, Melbourne; ^e Healthy Ageing Program, Department of Medicine, The University of Melbourne; ^f Centre for Medical Research, The Royal Melbourne Hospital; ^g Institute for Health and Ageing, Australian Catholic University, Melbourne; ^h Rehabilitation and Aged Care Services, Monash Health, Melbourne; ⁱ Monash Ageing Research Centre (MONARC), Monash University, Melbourne; ^j School of Public Health and Preventive Medicine, Monash University, Melbourne; ^k School of Physiotherapy and Exercise Science, Curtin University, Perth; ^l Aged Care Services, Austin Health, Melbourne; ^m Department of Medicine, The University of Melbourne; ⁿ Statistics and Decision Analysis Academic Platform, The Florey Institute of Neuroscience & Mental Health, Melbourne; ^o School of Science, RMIT University, Melbourne; ^p Stroke Division, The Florey Institute of Neuroscience and Mental Health, Melbourne, Australia

KEY WORDS

Mobility limitation
Rehabilitation
Exercise therapy
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ABSTRACT

Questions: Among older people receiving inpatient rehabilitation, does additional supervised physical activity lead to faster self-selected gait speed at discharge? Does additional supervised physical activity lead to better mobility, function and quality of life at discharge and 6 months following discharge? **Design:** Multi-centre, parallel-group, randomised controlled trial with concealed allocation, assessor blinding, and intention-to-treat analysis. **Participants:** Older people (age > 60 years) from two Australian hospitals undergoing rehabilitation to improve mobility. **Intervention:** Participants received multidisciplinary care, including physiotherapy. During hospital rehabilitation, the experimental group (n = 99) spent additional time daily performing physical activities that emphasised upright mobility tasks; the control group (n = 99) spent equal time participating in social activities. **Outcome measures:** Self-selected gait speed was the primary outcome at discharge and a secondary outcome at the 6-month follow-up. Timed Up and Go, De Morton Mobility Index, Functional Independence Measure and quality of life were secondary outcomes at discharge and tertiary outcomes at the 6-month follow-up. **Results:** The experimental group received a median of 20 additional minutes per day (IQR 15.0 to 22.5) of upright activities for a median of 16.5 days (IQR 10.0 to 25.0). Gait speed did not differ between groups at discharge. Mean gait speed was 0.51 m/s (SD 0.29) in the experimental group and 0.56 m/s (SD 0.28) in the control group (effect size -0.06 m/s, 95% CI -0.12 to 0.01, p = 0.096). No significant differences were detected in other secondary measures. **Conclusion:** While substantial gains in mobility were achieved by older people receiving inpatient rehabilitation, additional physical activity sessions did not lead to better walking outcomes at discharge or 6 months. **Trial registration:** ACTRN12613000884707. [Said CM, Morris ME, McGinley JL, Szoeki C, Workman B, Liew D, Hill KD, Woodward M, Wittwer JE, Churilov L, Danoudis M, Bernhardt J (2018) Additional structured physical activity does not improve walking in older people (> 60 years) undergoing inpatient rehabilitation: a randomised trial. *Journal of Physiotherapy* XX: XX-XX]

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Introduction

Healthcare systems are being challenged globally by the ageing population. The hospitalisation rate of people aged > 85 years in the USA is more than five times greater than that of people aged < 65 years.¹ People aged > 65 years accounted for 49% of Australian hospital bed days in 2014 to 2015.² Rates of emergency admissions to hospitals in the UK have increased in this group.³ Some older people require inpatient rehabilitation after an acute hospital admission to enable them to return to their previous living

arrangements and lifestyle; however, mobility remains suboptimal for many older people at discharge.⁴⁻⁶ A systematic review found that the usual-pace gait speed in older people in subacute settings was 0.53 m/s (95% CI 0.44 to 0.62),⁶ which was well below mean speeds of 1.2 to 1.3 m/s in healthy older adults. Gait speed is associated with disability, institutionalisation, falls and mortality,⁷ and is predictive of community activity levels.⁸ Gait speed is responsive to changes in walking ability,⁹ and increases in gait speed are associated with improvements in overall health status.¹⁰ It has been suggested that gait speed is the 'sixth vital sign' for

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older people.¹¹ It is therefore imperative to optimise gait speed during rehabilitation.

It is acknowledged that bed rest and inactivity in hospital are detrimental for mobility and function.¹² Low levels of physical activity in rehabilitation have been recorded;^{13–15} however, there are no evidence-based physical activity guidelines for older adults receiving inpatient rehabilitation. Increasing physical activity through structured interventions could lead to better outcomes in older adults. Existing evidence is conflicting. A systematic review by Peiris et al¹⁶ demonstrated that providing an additional average of 19 minutes of physiotherapy per day to hospitalised patients led to improved walking.¹⁶ The average age of participants in the review was 70 years, so the results may not be applicable to an older population. A more recent review, which was published after the present study commenced and was limited to subacute settings, found that providing additional after-hours or weekend rehabilitation services did not impact on walking speed.¹⁷ Both reviews included trials focused on specific conditions, such as stroke, and while both reviews included studies that provided additional rehabilitation or physiotherapy, the content and method of delivery of the additional services were variable. This multisite, randomised controlled trial was the logical next step following a promising pilot trial,¹⁸ which demonstrated the safety and feasibility of increasing physical activity in older people during rehabilitation.

Therefore, the research questions for this multicentre, parallel-group, randomised controlled trial were:

1. Among older people receiving inpatient rehabilitation, does additional supervised physical activity lead to faster self-selected gait speed at discharge?
2. Does additional supervised physical activity lead to better mobility, function and quality of life at discharge and 6 months following discharge?

Method

Design

The study was a multicentre, parallel-group, randomised controlled trial with concealed allocation, intention-to-treat analysis, and blinding of investigators and assessors. It examined the effect of additional supervised physical activity in older people receiving in-hospital geriatric rehabilitation in the metropolitan

area of Melbourne, Australia. At baseline, the mobility of participants was classified as non-ambulant or ambulant, as summarised in Table 1. Randomisation was stratified by site and mobility classification. After baseline data collection, participants were individually randomised to 'enhanced physical activity' (experimental group) or 'usual care plus matched face-to-face contact time' (control group), according to a computer-generated randomisation procedure performed by a third party. Group assignment was only available to intervention staff and project managers (JW, MD). Outcomes were measured at discharge and 6 months later. The trial was overseen by a management committee and an independent data safety monitoring committee. The full protocol has been published.¹⁹

Participants

All people admitted to four participating geriatric rehabilitation wards at two hospitals were screened. People admitted to these units are typically medically stable, but have complex health conditions requiring multidisciplinary management or rehabilitation to maximise function. Eligible patients were aged > 60 years and had a goal to 'improve mobility or walking', which was determined by admission referral or the treating therapist. Participants were excluded if: there were medical restrictions limiting mobilisation, goals were non-weight bearing, they were enrolled in another randomised trial, or the primary reason for admission was carer training or residential care placement. Informed consent was obtained from the participant or 'responsible person' within 48 hours of admission, with interpreters utilised as necessary.

Intervention

Both groups received usual care provided by a multidisciplinary team throughout their inpatient rehabilitation. This included input from physiotherapy, occupational therapy, nursing and medical staff, with additional input from other allied health staff as indicated. Therapy was individualised and addressed identified rehabilitation goals, which generally focused on maximising functional independence to facilitate hospital discharge. Typically, participants received one or two sessions of physiotherapy a day on weekdays. There was a limited physiotherapy service on weekends at both sites, with priority given to patients requiring assessments or treatment to facilitate discharge. To monitor usual care activities, usual care physiotherapy staff recorded, in 5-minute

Table 1
Functional classification of participants and summary of activities for experimental group.

Level	Function	Intervention
1	Patient is unable to transfer out of bed without maximum assistance (two persons or a hoist) and has poor static and dynamic sitting balance (unable to sit independently).	Bed exercise program (including lower limb, upper limb and abdominal strength and bed mobility) and sitting balance exercises.
2	Patient can transfer out of bed with assistance from one person, has independent sitting balance, but is unable to stand independently. Requires moderate assistance from two people to walk.	Sitting exercise program including targeted lower limb strengthening exercises. Sit to stand exercises, standing balance exercises, stepping/marching on the spot as able (using rails/gait aids for safety as indicated). Activities from the previous level may be included if specifically indicated. For example, if the participant is unable to perform full range movement against the effects of gravity, specific lower limb muscle strengthening exercises may be performed on the bed.
3	Patient can walk with minimal assistance of one person.	Walking exercises, sit to stand exercises, standing balance exercises, and step up exercises. Targeted lower limb strength exercises (where possible closed chain or functional strengthening exercises).
4	Supervision only or independence with ambulation. Requires minimal assistance or supervision on stairs.	Stairs exercises, walking exercises (including outdoor mobility), step up exercises, standing balance exercises. Targeted lower limb strength exercises as indicated (where possible closed chain or functional strengthening exercises).

Reprinted from Said et al.¹⁸

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