

# Patients receiving inpatient rehabilitation for lower limb orthopaedic conditions do much less physical activity than recommended in guidelines for healthy older adults: an observational study

Casey L Peiris<sup>1,2</sup>, Nicholas F Taylor<sup>1,2</sup> and Nora Shields<sup>1</sup>

<sup>1</sup>Department of Physiotherapy, La Trobe University, <sup>2</sup>Allied Health Clinical Research Office, Eastern Health Australia

**Question:** Are ambulant patients who are admitted for inpatient rehabilitation for a lower limb orthopaedic condition active enough to meet current physical activity guidelines? **Design:** Prospective observational study. **Participants:** Adults admitted for inpatient rehabilitation for a lower limb orthopaedic condition who were cognitively alert and able to walk independently or with assistance. **Outcome measures:** Participants wore an activity monitor for three full days. Daily time spent in moderate intensity physical activity was used to determine whether the levels of physical activity recommended in clinical guidelines were achieved. **Results:** Fifty-four participants with a mean age of 74 years (SD 11) took a median of 398 (IQR 140 to 993) steps per day and spent a median of 8 (IQR 3 to 16) minutes walking per day. No participant completed a 10-minute bout of moderate intensity physical activity during the monitoring period. One participant accumulated 30 minutes of moderate intensity physical activity and nine participants accumulated 15 minutes of moderate intensity physical activity in a day. Physical activity was associated with shorter length of stay ( $r = -0.43$ ) and higher functional status on discharge ( $r = 0.39$ ). **Conclusions:** Adults with lower limb orthopaedic conditions in inpatient rehabilitation are relatively inactive and do not meet current physical activity guidelines for older adults. Results of this study indicate that strategies to increase physical activity are required. [Peiris CL, Taylor NF, Shields N (2013) Patients receiving inpatient rehabilitation for lower limb orthopaedic conditions do much less physical activity than recommended in guidelines for healthy older adults: an observational study. *Journal of Physiotherapy* 59: 39–44]

**Key words:** Motor activity, Orthopaedics, Rehabilitation, Physical therapy modalities, Exercise therapy

## Introduction

Regular physical activity is directly related to positive health outcomes (Schnohr et al 2003, Wen et al 2011). To achieve positive health outcomes guidelines recommend that adults should accumulate 30 minutes of moderate intensity aerobic activity on most days of the week (Pate et al 1995). Updated versions of these guidelines, which also consider older adults ( $\geq 65$  years) and people with chronic health conditions, state that the activity must be completed in bouts of 10 minutes or more, on at least 5 days of the week (Haskell et al 2007, Nelson et al 2007, WHO 2011). There is emerging evidence to suggest that as little as 15 minutes of moderate intensity physical activity may be beneficial to health for community-dwelling adults and older adults (Wen et al 2011). Furthermore, it is recommended that older adults who are limited by health conditions be 'as physically active as their abilities and conditions allow' (WHO 2011).

Orthopaedic rehabilitation aims to promote independence and improve function to prepare patients to return to living independently in the community. Therefore, it could be expected that patients are trained while in rehabilitation to have levels of physical activity that are recommended for maintenance of health, in preparation for living independently in the community. However, adults with lower limb orthopaedic conditions in inpatient rehabilitation may find it difficult to be sufficiently active to meet physical activity guidelines because of the difficulty in restoring mobility after injury and/or surgery (Beringer et al 2006, Groen et al 2012, Koval and Zuckerman 1994, Resnick et al

2011, Schmalzried et al 1998, Silva et al 2005). Following hip fracture, inpatients who were more active during therapy sessions had better functional outcomes than those who were less active (Talkowski et al 2009), suggesting a positive relationship between physical activity and functional outcome. However, we were unable to locate any research that quantifies the physical activity levels of adults with lower limb orthopaedic conditions during inpatient rehabilitation in relation to physical activity guidelines. Therefore, the research questions for this study were:

1. Are ambulant patients who are admitted for inpatient rehabilitation for a lower limb orthopaedic condition active enough to meet current physical activity guidelines?
2. Is there a relationship between physical activity and functional outcome in this population?

**What is already known on this topic:** Various guidelines recommend the amount, intensity, duration and frequency of physical activity that adults should undertake to maintain health. Orthopaedic rehabilitation aims to restore sufficient function to allow independent living in the community, which ideally would include restoration of the recommended physical activity levels.

**What this study adds:** Inpatients receiving rehabilitation for lower limb orthopaedic conditions are relatively inactive and do not meet current physical activity guidelines. Changes are required to reverse this sedentary behaviour during rehabilitation.

## Method

### Design

This prospective observational study was conducted on a subgroup of participants during the baseline phase (ie, prior to the randomised intervention) of a randomised controlled trial evaluating the effects of additional weekend allied health services (Peiris et al 2012a). Participants underwent objective physical activity monitoring for three days and their activity levels were assessed against recommended levels of activity in several guidelines about physical activity for maintenance of health. This study took place on one ward at an inpatient rehabilitation facility with 30 rehabilitation beds servicing a metropolitan area over a 4-month period (1 March 2011 to 30 June 2011).

### Participants

Patients were included if they were aged 18 years or older, were admitted for rehabilitation in the orthopaedic ward, had a lower limb orthopaedic condition (eg, hip or knee replacement, hip fracture), were able to walk (independently or with assistance), and were cognitively alert. To estimate the physical activity pattern of an adult reliably, at least three days of monitoring is recommended (Trost et al 2005) so patients were only eligible if they had three consecutive days of weekday monitoring before the randomised intervention of the larger study began. All patients received usual medical, nursing and allied health care.

### Outcome measures

*Primary outcome:* To determine whether physical activity guidelines were being met, activity monitor data were used to compare the level of physical activity to three physical activity guidelines:

1. 30 minutes accumulated moderate intensity physical activity per day (Pate et al 1995);
2. 30 minutes of moderate intensity physical activity per day accumulated in bouts of at least 10 minutes (Haskell et al 2007, Nelson et al 2007, WHO 2011); and
3. 15 minutes accumulated moderate intensity physical activity per day (Wen et al 2011).

Measures of moderate intensity were obtained from the activity monitors through secondary analysis via a custom-made software program using threshold values:

1. Walking cadence > 60 steps/minute. Greater than 100 steps/minute is accepted as moderate intensity (Rowe et al 2011) but at least 60 steps/minute may be beneficial to health (Tudor-Locke et al 2011) and was therefore used as a threshold for moderate intensity in this population where mobility is limited.
2. Metabolic equivalents (METs) > 3.0. The activity monitor assigns a MET value to each activity it records according to the Compendium of Physical Activities (Ainsworth et al 1993). It assigns fixed values to sitting, lying, and standing while the value for stepping increases with increased cadence. It is estimated that individuals expend 3 to 6 times their basal METs when completing moderate intensity activity (Haskell et al 2007).
3. Activity counts > 1075 counts. Activity counts are based on an algorithm that averages bodily accelerations (recorded every tenth of a second) into activity counts per 15 seconds. Greater than

1075 activity counts per 15 seconds is considered moderate intensity in young adult females in free-living situations (Harrington 2010). We were unable to locate threshold values for older adults.

Because normal walking is not always continuous and may include short breaks in motion (eg, when stopping to talk to someone in the corridor) these were accounted for when assessing activity bouts. A modified 10-minute activity bout definition, which takes into account interruptions of up to 2 minutes, was applied and has been used previously (Harrington 2010, Troiano et al 2008).

*Secondary outcomes:* Outcomes used to describe physical activity levels included steps per day, time spent in upright activities per day (minutes), time spent walking per day (minutes), and time spent inactive per day (hours). The Functional Independence Measure (FIM) was used to assess the amount of assistance required to complete activities of daily living at baseline and on discharge (Hamilton and Granger 1994). The FIM consists of 18 items in two domains: motor (13 items) and cognitive (5 items). Each item is rated on a 7-point scale, where 1 reflects complete dependence and 7 reflects complete independence. Scores range from 18 (lowest function) to 126 (highest function). The FIM mobility score refers to items 9 through 13 which relate to transfers, walking, and stairs. Co-morbidities were recorded using the Charlson Co-morbidities Index (Charlson et al 1994), the 10-metre walk test (Hollman et al 2008) was used to calculate cadence at baseline (steps per minute), and length of stay in inpatient rehabilitation (days) was recorded.

A uniaxial accelerometer-based activity monitor<sup>a</sup> was used to provide an objective measure of physical activity. Activity monitors were attached to the participant's non-affected lower limb on the mid-anterior thigh at the earliest convenient time after admission and remained in place for five days (the middle three days of recording were used to ensure that three complete days were drawn on for analyses). To allow for continuous monitoring (including showering) the monitor was taped inside a zip-lock bag and affixed to the skin with a water-proof medical dressing.

The activity monitor used is a valid and reliable measure of walking in healthy adults (Ryan et al 2006) and community dwelling older adults (Grant et al 2008), and is a valid measure of activity or inactivity for the long-term monitoring of older adults with impaired function (Taraldsen et al 2011) and of steps taken at slower walking speeds (Kanoun 2009).

### Data analysis

The number of participants meeting activity guidelines was described. For normally distributed data the mean and standard deviation (SD) were reported. For skewed data the median and inter-quartile range (IQR) were reported. Bivariate correlations examined the relationships between steps taken per day, length of stay and FIM.

## Results

### Flow of participants through the study

One hundred and nine orthopaedic patients were admitted to the ward during the study period. Only patients who were available to have the activity monitors applied early in the week (Monday or Tuesday) were screened for eligibility to

Download English Version:

<https://daneshyari.com/en/article/5864187>

Download Persian Version:

<https://daneshyari.com/article/5864187>

[Daneshyari.com](https://daneshyari.com)