Walking aid use after discharge following hip fracture is rarely reviewed and often inappropriate: an observational study

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Questions: What walking aid prescription occurs at discharge after hip fracture? What changes in walking aid use occur in the following six months? Who initiates changes in walking aids and why? **Design**: Prospective longitudinal observational study. **Participants**: 95 community-dwelling older adults who had undergone surgical treatment of a hip fracture. **Outcome measures**: Range of walking aids prescribed at discharge and participants' recall of advice about progression were recorded. Progression of walking aids was observed fortnightly over 6 months. With any change in walking aid use, an independent physiotherapist determined if it was appropriate and participants reported the reason for the change. **Results**: Most participants were discharged from their final inpatient setting with a wheeled frame (92%). Eighty-two (86%) participants were not aware of any goals set by the physiotherapist for the first 6 months and 89 (94%) stated that a review time had not been set. Despite this, 78 (82%) participants changed their walking aid, on average 8 weeks (SD 6) after discharge. However, 32% of those who changed their walking aids were using an inappropriate aid or using it incorrectly. Six months after discharge, 40% of participants had not returned to using their pre-morbid indoor aid and 50% their outdoor aid. **Conclusion**: A review of walking aid by a physiotherapist is rare within six months after discharge following hip fracture. Most patients make their own decision about what walking aid is most appropriate. This has safety implications in a group at high risk of falls. **[Thomas S, Halbert J, Mackintosh S, Cameron ID, Kurrle S, Whitehead C, Miller M, Crotty M (2010) Walking aid use after discharge following hip fracture is rarely reviewed and often inappropriate: an observational study. *Journal of Physiotherapy* 56: 267–272]**

Key words: Walking aid, Hip fracture, Frail elderly, Physiotherapy

Introduction

Walking aids are provided to patients as part of routine rehabilitation following surgery for hip fracture to compensate for pain, reduced strength and balance, and postoperative restrictions on weight-bearing. The ultimate goal of rehabilitation is to reduce the level of assistance required with ambulation and to return to pre-morbid levels of function. However, progression in individual patients varies dramatically depending on the rate of improvement of strength, balance, confidence, and pain (Bohannon 1997). As a result, it would be appropriate for many of the walking aids to be changed over the first six months, although the time of change would vary.

Use of walking aids is associated with an increased risk of falling (Bateni and Maki 2005, Campbell et al 1981, Charron et al 1995, Graafmans et al 2003, Liu et al 2009, Mahoney et al 1994). In an older population the use of a walking aid can affect the gait pattern, reducing gait speed, step length and swing time, increasing stance time (Liu et al 2009), inhibiting normal arm swing (Van Hook et al 2003), and affecting posture (Liu 2009, Mann et al 1995). One study estimated that 47 312 fall injuries in older adults treated annually in US emergency departments were associated with walking aids: 87% with frames and 12% with canes (Stevens et al 2009). There is little evidence to suggest whether the use of the walking aid alone leads to this risk (Bateni and Maki 2005, Liu et al 2009), or if it is related to the decreased level of physical function, increased frailty, and poorer general health that users of walking aids may have (Andersen et al 2007, Campbell et al 1981). However, inappropriate walking aid prescription, inadequate training of the user and un-prescribed use of walking aids are likely to exacerbate the problem (Andersen et al 2007, Bateni and Maki 2005, Brooks et al 1994, Stevens et al 2009).

This highlights the need for regular review of walking aid use by a physiotherapist following hip surgery to ensure that it remains appropriate and safe. Currently most rehabilitation services are provided to this population for only the first four to six weeks after fracture, even though physical function may still not be regained one year later (Jette et al 1987, Koval et al 1995, Marottoli et al 1992, Mossey et al 1989). Given this short period of rehabilitation, it is unclear whether walking aids are reviewed subsequently and whether walking aid progression is appropriate after discharge.

The aim of this study was to describe the prescription of walking aids and how, why, and by whom the walking aids are progressed after discharge following surgery for hip fracture. Therefore, the research questions for this study were:

1. What walking aid prescription occurs at discharge after hip fracture surgery?
2. What changes in walking aid use occur during the six months after discharge?
3. Who initiates these changes and are they appropriate?

Method

Design

This study was conducted as part of the I T ACTIV trial (ACT 12 0700001742), a prospective randomised trial in which participants were randomly allocated to a -month individualised nutrition and exercise program (Gardner et al 2001) or to an attention control. Both groups received all usual standard care. • hysiotherapists who were responsible for standard care were made aware that it should be continued, even though participants may have had contact with the trial•s physiotherapists for assessment and for the exercise intervention. The intervention was supervised on a weekly basis, with alternate home visits by a dietitian and a physiotherapist (Thomas et al 2008).

' or the current study, the first 101 participants in the I T ACTIV trial were followed in a longitudinal observational study. emographic data, including age, gender, past medical history, pre-fracture walking aid, type of fracture and type of surgery, were collected on admission to hospital following the hip fracture. After participants were discharged following surgery for hip fracture, a research physiotherapist performed home visits every 2 weeks for months to monitor walking aid use. Walking aid prescription and review was not part of the intervention provided in the I T ACTIV trial.

Participants

• atients were included if they were admitted with a diagnosis of hip fracture confirmed by radiology report, aged 70 years and over, and community-dwelling within existing local service boundaries, with a Mini Mental Score (' olstein et al 1975) of at least 18 out of 30 and a body mass index between 18.5 and 35. xclusion criteria were a pathological fracture or malignancy, non- nglish speaking, limited to stand transfers only post surgery or non-ambulatory before the fracture, unable to give informed consent, or medically unstable 14 days after surgery. All those individuals who met the study criteria were invited to participate.

Outcome measures

ata about walking aid prescription were collected by questionnaire. These data included the type of aid, who had prescribed it, and whether goals and a review date had been set at the time of prescription. The questionnaire was developed after a review of the literature, review of questions used in previous surveys, and in consultation with researchers in the field. The aim was to capture information on the type of walking aid prescribed, who had prescribed the aid and why, participant recall of education on safe and appropriate use and any goals established, and whether a time to review the aid had been set (see Appendix 1 on the eAddenda for the questionnaire). The appropriateness of the aid was determined through observation of walking aid use and inspection of walking aids.

The first assessment took place when participants had been discharged from their final inpatient setting, ie, to the location where they would be permanently residing after their hip fracture. The research physiotherapist attended fortnightly to assess walking aid suitability (height, defects, technique, and gait pattern) based on clinical judgement and recommended practice: •a suitable walking aid must be appropriate to the patient•s abilities, correctly si ed and free of defects. An aid failing to meet any of these criteria is unsuitable.• (Simpson and • irrie 1991, p231). Observation of

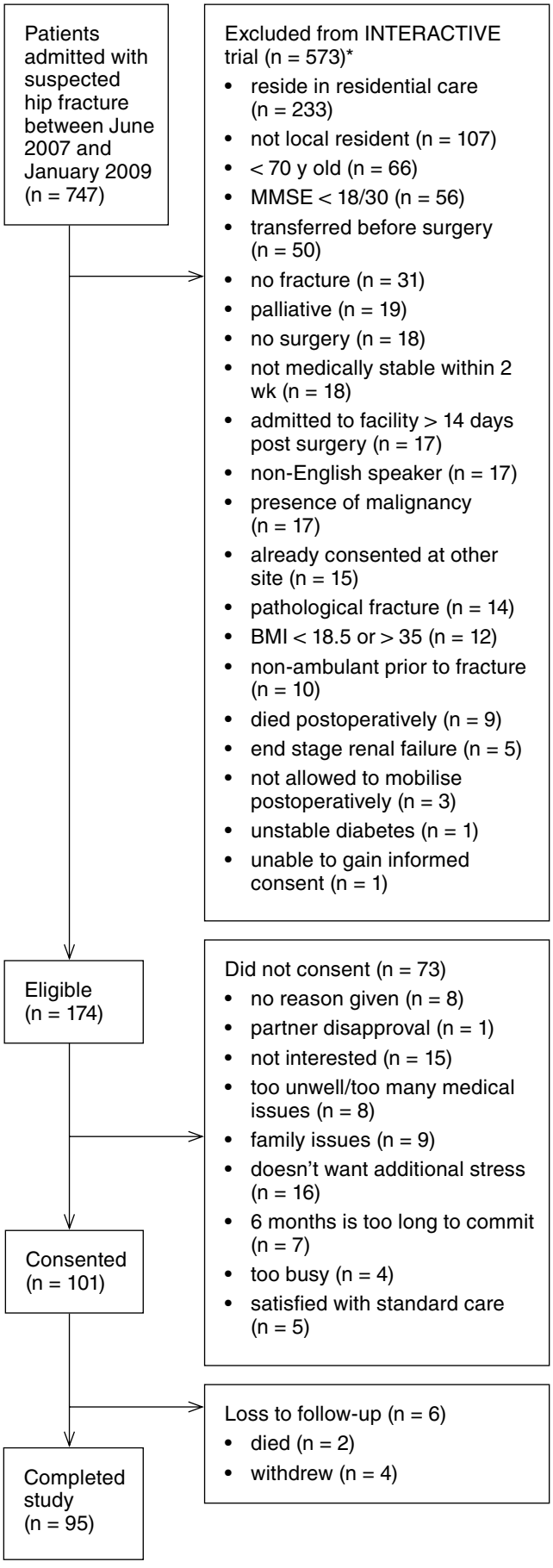

Figure 1. Flow of participants through the study.

* More than one reason for ineligibility could be recorded

Table 1. Characteristics of eligible patients who consented or did not consent to participate.

Characteristic	Patients	
	Consenting (n = 101)	Non-consenting (n = 73)
Age *(yr)*, mean (SD)	83 (6)	83 (7)
Gender, n male (%)	26 (26)	24 (33)
MMSE score *(0–30)*, mean (SD)	25 (4)	25 (4)
Accommodation, n living alone (%)	60 (59)	29 (40)

MMSE = mini-mental state examination

walking aid use occurred at all visits and the questionnaire was completed on the first visit and every time a participant changed their walking aid or their use of the walking aid between visits.

Data analysis

ata were summarised and presented as a percentage of the whole cohort or with other descriptive statistics. Cross-tabulation with chi-squared analysis was used to assess the relationships between variables. The alpha probability level was set at p 0.05.

Results

Flow of participants through the study

Between 4 June 2007 and 4 January 2009, 747 hip fracture patients were screened for eligibility to participate: 47 at ' linders Medical Centre, 192 at ' linders • rivate Hospital, and 79 at Griffiths ehabilitation Hospital. easons for exclusion, non-consent, and loss to follow-up are shown in ' igure 1. Among those who were eligible, demographic characteristics did not significantly differ between those who did and did not consent to participate (see Table 1). Of the 101 participants, 84 (88%) were eventually discharged home, with 12 (14%) being discharged directly home from the acute setting and 7 (8 %) after some form of rehabilitation at a separate public or private rehabilitation facility.

Walking aid prescription

The majority of participants were discharged from their final inpatient setting with a two-wheeled walker (n 58, 1%) or a four-wheeled walker (n 29, 31%), prescribed by the inpatient physiotherapist. All participants reported receiving education on how to use these aids. Table 2 summarises walking aid use before and after hip fracture. The walking aid prescribed on discharge from the inpatient setting was considered to be appropriate by the research physiotherapist for 88 (93%) participants. easons for deeming walking aids inappropriate included that they were too high (n 3) or too low (n 2), that the aid was being used incorrectly (n 1: a four-wheeled walker with one arm rest raised higher than the other), and that the aid was inappropriate (n 1: lean on brakes would have been more appropriate than lock down brakes). Of these seven inappropriate walking aids, two were purchased privately, two were hired from a community agency following discharge, one was borrowed from a friend, and two were hired directly from the inpatient facility from where the participant was discharged.

Walking aid changes

In the first six months after discharge, the aid prescribed on discharge was changed by 78 (82%) participants. This change occurred at a mean of 8 weeks (S) after fracture. The earliest observed change was in the same week as discharge and the latest was at 22 weeks. In some instances participants modified their aid only for indoor or only for outdoor use, but others changed the aid being used for both.

At six months, 53 (5 %) participants returned to using the same walking aid indoors as they had used prior to sustaining their fracture, 38 (40%) participants had not progressed onto their original indoor walking aid, and 4 (4%) participants who originally reported using a walking stick indoors were walking unaided at six months (Table 2). Based on the assessment of the research physiotherapist, of those who had returned to using their same indoor pre-morbid walking aid or to a less supportive aid or no aid, 15 participants had done so inappropriately. With regard to outdoor walking aids, 47 (50%) participants had not returned to their pre-morbid walking aid. Of the 48 (51%) participants who had returned to their same outdoor aid, a less supportive aid, or no aid, 10 had done so inappropriately.

Table 2. Walking aid use before hip fracture, at discharge following surgery for hip fracture, and 6 months after discharge.

Walking aid	Before fracture		At discharge	6 months after discharge	
	Indoors n (%)	Outdoors n (%)	n (%)	Indoors n (%)	Outdoors n (%)
None	74 (78)	43 (45)	0 (0)	44 (46)	16 (17)
Walking stick	11 (12)	21 (22)	6 (6)	18 (19)	27 (28)
Four-wheeled walker	8 (8)	28 (30)	29 (31)	17 (18)	40 (42)
Two-wheeled walker	1 (1)	2 (2)	58 (61)	13 (14)	10 (11)
Pick-up frame	1 (1)	1 (1)	0 (0)	0 (0)	0 (0)
Three-wheeled walker	0 (0)	0 (0)	1 (1)	2 (2)	2 (2)
Gutter frame	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)
Tray mobile	0 (0)	0 (0)	0 (0)	1 (1)	0 (0)

There was no association between those participants who were cognitively impaired (MMS 24) and inappropriate walking aid use indoors (χ^2 (1) 0.229, p 0. 3), or outdoors (χ^2 (1) 1.177, p 0.28). Similarly, age, gender, type of surgery, type of fracture, and number of co-morbid medical conditions were not associated with inappropriate walking aid use at months.

Most participants (n 82, 8 %) were not aware of any goals set by the physiotherapist on discharge from the inpatient setting related to progression of their walking aid and ambulation. When goals were established and could be recalled by the participants they included such things as •aim to get onto a walking stick•four-wheeled walker as soon as possible• (n 5), •use the prescribed aid until safe to trial a walking stick indoors• (n 3), and •use until reviewed by the surgeon• (n 1). According to 89 (94%) participants a review time had not been set by the physiotherapist who prescribed the walking aid, and 58 (1%) were not aware of how long they should continue to use the prescribed walking aid. Of the 37 (39%) participants who stated that they were aware of how long they should use the prescribed aid, the most common responses were •assuming for life• (n 12) or •assuming for weeks•3 months because that is the length of the loan period• (n 11).

' or only 1 (17%) participants, the decision to change a walking aid was based on the recommendation of a physiotherapist. Many participants made the decision to change the aid themselves, citing reasons such as •walking• confidence has improved• (n 28), •doesn•t feel that the aid is required anymore• (n 7), •prefer one (walking aid) over another• or •find one (walking aid) easier to use• (n 10). Others (n 10, 11%) based their decision to change the aid on the recommendation of people other than physiotherapists, including a family member, a care worker at a residential care facility, a community nurse, or an orthopaedic surgeon. The research physiotherapist reported that 25 (32%) of the 79 participants who changed their aid began using an inappropriate walking aid or using it incorrectly. easons for concern included that the aid was too high (n 9) or too low (n 2), that mobility was unsafe (n 7), that the aid was being used incorrectly (in the wrong hand or the wrong way around, n 3), and that the aid was inappropriate (n 4: difficulty turning two-wheeled walker, antalgic gait leading to an increase in hip pain, push down brakes too difficult for patient to understand, use of a tray mobile instead of a walking aid).

Discussion

In this sample we found that a high proportion of hip fracture patients are discharged from hospital on a walking aid without a clear understanding of when to change aids and are not returning to their pre-morbid walking aid by six months after their fracture. There was a lack of walking aid review by a physiotherapist throughout this period and a high number of participants were making their own decisions about what walking aid was most appropriate for their use. This may have contributed to a third of participants using walking aids deemed as inappropriate by the research physiotherapist. This study also identifies that when participants are managing to return to their pre-morbid walking aid, it does not always mean that it has been done so appropriately and safely. What is most concerning is that the population studied was already at a high risk of falls, with all participants having sustained a fall related fracture, and inappropriate walking aid selection, and incorrect walking aid use, may lead to an increased risk of falls (Bateni and Maki 2005, Campbell et al 1981, Charron et al 1995, Graafmans et al 2003, Koval et al 1995, Liu et al 2009, Mahoney et al 1994).

The strict exclusion criteria of the I T ACTIV trial meant that only 23% of all patients admitted to the recruitment sites were eligible for participation in the study. The main reason for exclusion from this study was residence in an aged care facility, thus the results are not generalisable to those settings. However, the authors believe that the findings are applicable to older people who live in community settings following hip fracture. Of the 23% who were eligible, 5 % did consent, meaning that even if those participants who did not consent had perfect walking aid prescription, a substantial proportion of the cohort would still have been using an inappropriate aid, putting them at risk.

The results suggest that scheduling of formal follow up by a physiotherapist might be appropriate for hip fracture patients on discharge from hospital. A high proportion of participants (32%) were observed not only to make inappropriate choices of walking aid, but also to use the walking aid in an unsafe manner. The nature of misuse of walking aids observed in the study (ie, inappropriate aids or inappropriate non-use of aids) could be expected to further compromise balance and increase the potential for falls. • articipants often assumed inaccurately that, because hired equipment had a specified loan period, this directly correlated with the amount of time that they would be required to use the walking aid. When participants could remember goals that had been specified by the physiotherapist, the goals were non-specific and relied on judgments about safety, which may have been difficult for patients to make without discussion with a physiotherapist, eg, •use until safe to trial a walking stick• or •use until able to walk unaided•. When participants made the decision to change their walking aid, it was often not on the advice of a physiotherapist and in most instances was based on their own opinions. Social stigmas attached to ageing, disability, and medical device use may have powerful in uences on older persons• decisions to accept or reject mobility aids (Liu et al 2009). Self-made decisions about walking aid use may be heavily in uenced by factors other than physical needs.

Most (82%) participants changed their walking aid at some stage in the first six months after discharge and on average this occurred after approximately eight weeks. This is consistent with a prospective study on the outcomes of 120 community-dwelling women after hip fracture (Williams et al 1994a, Williams et al 1994b). In this study, mobility recovery continued during the first 14 weeks after fracture with the most rapid change occurring between two and eight weeks. A physiotherapist should have reviewed participants• mobility over this period, and certainly beyond the first six weeks after discharge. et, nearly 94% of participants reported that no review date had been scheduled and, as it currently stands in South Australia, most rehabilitation ceases within six weeks post fracture, which is short of what would appear to be the optimum mobility review period.

Some limitations of this study are acknowledged. The study participants were enrolled in a randomised trial and therefore may not have been a representative sample of hip fracture patients. However, it is likely that we recruited patients with sufficient cognitive ability and social supports

to allow participation in a clinical trial. Therefore, our results are likely to underestimate the misuse of walking aids by patients discharged from hospitals after hip fracture. ' urther underestimation may have occurred due to the exclusion of non- nglish speaking people. They are potentially at greater risk of not receiving clear instructions regarding walking aid prescription and use, due to communication barriers between patients and therapists. Another limitation is that the findings around whether goals had been established or if education on walking aid use had been provided relied heavily on recall by the participant. • ossibly physiotherapists did put plans in place and explained to participants how to progress their walking aids, but participants could not recall this having occurred. egardless, this highlights the need for follow up, because even if participants did receive the information during their admission, this study shows that they are unlikely to retain this information after discharge.

Also, it cannot be ignored that half of the observed participants in this study were receiving an additional intense exercise intervention as part of a clinical trial. Although reviewing and progressing the walking aids of individual participants was not the primary aim of the research physiotherapist, it is possible that the physiotherapist was more proactive with the intervention group than the control group in providing advice and education regarding walking aid use. This could have in uenced the length of time until a participant changed their walking aid, or the appropriateness of walking aid use. However, this would be expected to have had a positive effect on walking aid use.

In conclusion, follow up by physiotherapists of walking aid use in the early recovery phase of hip fracture is limited and walking aid misuse is common in the first six months of recovery. A high proportion of older patients make decisions about their walking aid use without input from physiotherapists and this was observed in conjunction with a relatively high proportion of inappropriate walking aid use. This is particularly concerning given that up to 53% of people who have suffered a hip fracture will fall again in the subsequent six months (Shumway-Cook et al 2005). We would urge physiotherapists to consider organising a review of walking aid use and mobility following discharge. A future study looking at the effect of walking aid prescription on reducing falls should also be a priority. ■

eAddenda: Appendix 1 available at www.Jo•.physiotherapy.asn.au

Ethics: The ' linders Clinical esearch thics Committee approved this study esearch Application 110•0 7. All participants provided written informed consent before data collection began.

Support: This work was supported by a grant from the ational Health and Medical esearch Council 42 758 and a ational Health and Medical esearch Council • riority • ublic Health esearch Scholarship grant I 480484 to ST.

Acknowledgements: We are grateful to the participants who agreed to take part in the I T ACTIV trial and to the research assistants and staff who assisted in data collection at all of the recruitment sites.

Competing interests: one declared.

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