Changes in Intensity and Duration of Walking among Older Adults from In-Patient Geriatric Rehabilitation to Home

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ABSTRACT

Purpose: We compared walking in hospital and on discharge from in-patient geriatric rehabilitation. **Method:** Participants included 28 adults (22 women) with a mean age of 85.4 (SD 6.8) years, ambulating independently with planned discharge to the community. Steps per day, short and long walking bouts, and cadence (steps per minute) were measured using an ActiGraph GT3X+ activity monitor (5 d in hospital, 5 d at home). **Results:** Steps per day did not differ between hospital and home (median difference = 401; 95% CI: -364, 1,215; $p = 0.10$). Long walking bouts (≥ 5 min) were infrequent in both locations (1/d) but lasted longer in hospital. Short walking bouts (≥ 15 s) were more frequent and shorter at home. Daily peak 1-minute cadence and peak 30-minute cadence were greater in hospital. **Conclusions:** Older adults in geriatric rehabilitation take longer walks and walk at faster paces in hospital, and they engage in more frequent, shorter walks at home. Although further research is needed, older adults would benefit from the opportunity to walk at different paces and different distances on discharge. Outpatient rehabilitation or other community-based programmes and initiatives may provide these experiences and appropriate environments to enable individuals to maintain mobility and independent functioning in the long term.

Key Words: accelerometry; exercise; patient discharge; aged; rehabilitation.

RÉSUMÉ

Objectif : comparer la marche à l'hôpital et après le congé d'un centre de réadaptation gériatrique. **Méthodologie :** les chercheurs ont recruté 28 adultes (22 femmes) d'un âge moyen de 85,4 ans (ÉT 6,8 ans), qui déambulaient seuls et qui devaient obtenir leur congé dans la communauté. Ils ont mesuré le nombre de pas par jour, les courtes et longues séances de marche et la cadence (nombre de pas par minute) au moyen d'un moniteur d'activité ActiGraph GT3X+ (cinq jours à l'hôpital, cinq jours à la maison). **Résultats :** le nombre de pas par jour ne différait pas entre l'hôpital et la maison (différence médiane = 401; IC à 95 % : -364, 1 215; $p = 0,10$). Les longues séances ($\geq$ cinq minutes) étaient peu fréquentes aux deux endroits (une par jour), mais plus prolongées à l'hôpital. Les courtes séances (≥ 15 secondes) étaient plus fréquentes et plus brèves à la maison. La cadence de pointe quotidienne au bout d'une minute et de 30 minutes était plus élevée à l'hôpital. **Conclusions :** les aînés en réadaptation gériatrique marchent plus longtemps et plus rapidement à l'hôpital, mais plus souvent et moins longtemps à la maison. Des recherches plus approfondies devront être réalisées, mais les aînés profiteraient d'occasions de marcher à diverses cadences et sur diverses distances après leur congé. La réadaptation en milieu ambulatoire ou d'autres programmes et initiatives communautaires pourraient favoriser ces expériences et fournir des milieux adaptés pour que les aînés conservent leur mobilité et leur autonomie à long terme.

Maintaining mobility is fundamental for older adults to lead active and independent lives.¹ Regular, daily walking plays an important role in maintaining mobility and function,² but this is usually disrupted when older people are hospitalized.^{3,4} Low levels of mobility⁵ and older age⁶ are associated with loss of independence in activities of daily living during and after hospital admission.

Accelerometer-based monitors have been used to objectively measure physical activity and ambulation among hospitalized older adults.^{3,7-10} In studies conducted in Acute Care for the Elderly (ACE) units,^{3,11} people typically take only 330–850 steps per day.^{3,7,9} (In comparison, community-dwelling older adults usually walk 5,605–9,981 steps per day.¹²⁻¹⁴) However, very few studies have

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investigated changes in walking when older adults leave hospital. One study recently reported that older adults who had undergone elective, primary, total hip arthroplasty increased their walking from 235 to 2,563 steps per day over their first 30 days at home.¹⁵ Another study measured ambulation in older adults for 5 days on discharge home from an ACE unit.⁸ Mean daily steps was 3,850 (SD 3,104) in the first week at home, and ambulation during this time was a better predictor of readmission than age, previous functional status, or length of hospital stay.

To allow older adults continued in-patient rehabilitation, they may be transferred from an acute ward to an inpatient Geriatric Assessment and Rehabilitation Unit (GARU) in Canada or a Geriatric Evaluation and Management Unit (GEM) in the United States. The approach to care and the physical environment in a GARU or GEM is similar to that in an ACE unit: Both attempt to foster frequent ambulation, familiarity, and socialization. Patients in geriatric rehabilitation are generally less acutely ill, but they have higher rates of comorbid conditions and lower baseline functioning than those in acute care.¹⁶

Two measures (active time per day and steps per day) represent high-level, aggregate measures of physical activity. The few studies that have quantified activity in patients in geriatric rehabilitation used the outcome of active time per day^{17–19} as opposed to steps per day; this makes it difficult to compare findings with those reported for people in acute care. Further analyses of the intensity and duration of active periods each day can be evaluated when they include cadence (steps per minute) and details of walking bouts. These outcomes have been reported in large population studies^{20,21} and in research with specific patient groups,^{22–25} but they have not been described for patients in geriatric rehabilitation or used to compare hospital and home data.

The primary objective of this study was to estimate the extent to which ambulation in people in geriatric rehabilitation changed after the transition from in-patient rehabilitation to home. On the basis of previous studies conducted with older adults in acute care, we hypothesized that steps per day would increase once individuals went home.^{8,15} A secondary objective was to estimate the extent to which demographic factors and measures of mobility explain walking activity in hospital and at home.

METHODS

Study design

This study used a prospective pre- and post-discharge design. Participants wore an activity monitor for 5 days in hospital and for their first 5 days at home. We collected demographic information and measures of mobility in hospital. We obtained ethical approval from the University of Manitoba Health Research Ethics Board and the

Riverview Health Centre review board. All participants provided written, informed consent.

Setting and participants

We conducted a power equation to determine an appropriate sample size. On the basis of pilot work²⁶ and results reported for acute care,⁸ we projected that it would be clinically important for steps per day to increase by 1,000 or more when participants were discharged home. We estimated that the correlation between steps per day in hospital and at home would be relatively high (approximately 0.80); this yielded a standard deviation of change equal to 1,400 steps. To detect a medium effect size (power = 0.80; α = 0.05), a sample size of 25 participants was needed. To account for approximately 20% attrition, we recruited 32 participants.

This study took place on the geriatric rehabilitation ward at Riverview Health Centre in Winnipeg. The average length of stay on the ward is 42 days, with the majority of patients returning home or to an assisted living facility. The programme admits adults aged 65 years or older who are medically stable and require additional rehabilitation. Patients attend physical therapy twice per day: 45 minutes of circuit exercises in the morning and a 30-minute balance class in the afternoon. On the ward, patients are encouraged to walk as much as possible, including to and from their rehabilitation sessions and to and from the dining room. Individuals ambulating on the ward (with or without a walking aid) who had a minimum score of 25 out of 30 on the Mini-Mental State Examination (MMSE)²⁷ and a planned discharge to the community (house, apartment, or assisted living facility) in the next 2 weeks were eligible to participate. If patients required physical assistance by another person to walk safely or had any acute condition that limited safe participation (e.g., poor circulation, swelling, or an open wound around the ankle), they were not eligible.

Measures

Demographics

We gathered the following information from participants' medical charts: MMSE score, age, Functional Independence Measure (FIM) score,²⁸ current and past medical conditions, and number of medications prescribed in hospital.

Measure of mobility

A physical therapist measured each participant's height and weight and conducted the following tests of capacity for mobility: 10-minute walk test,²⁹ 30-second sit-to-stand test (number of times the participant could move from sitting to standing in 30 s without using the armrests on a chair),³⁰ and the timed-up-and-go (TUG) test (the time it took to stand up from a chair with or without using the armrests, walk forward 3 m, turn around, and return to sitting in the chair).³¹ Two repetitions of the TUG test were performed, and the results from the second were used in our analysis.

Table 1 Participant Characteristics

Variable	Mean (SD)*
Age, y	85.4 (6.8)
FIM score†	95.3 (9.9)
No. of medications†	7.7 (2.5)
Median (IQR) BMI, kg/m ²	24.4 (5.8)
Gait speed in 10-m walk test, m/s	0.6 (0.2)
Median (IQR) timed up-and-go test, s	27.4 (11.4)
Median (IQR) no. of sit-to-stand transitions in 30 s	3 (5)
Median (IQR) no. of days between hospital and home monitoring	13.0 (15.5)

* Unless otherwise indicated.

† Because information was missing from some participants' medical charts, FIM score is reported for 27 participants, and the number of medications is reported for 26 participants. All other variables reflect the data from 28 participants.

Functional Independence Measure = FIM; IQR = inter-quartile range.

Activity monitoring

Participants wore an ActiGraph GT3X+ activity monitor (ActiGraph LLC, Pensacola, FL) during waking hours for 5 days in hospital and for the first 5 days after discharge. Research staff telephoned participants every day after discharge to remind them to wear the activity monitor. Twenty-six participants wore the monitor proximal to the lateral malleolus on the right ankle, and 2 wore it on the left ankle because they had swelling around the right ankle. The GT3X+ is accurate in detecting steps in older adults who walk at slow speeds, including geriatric in-patients, when worn on either ankle and the low-frequency extension (LFE) algorithm is used.^{32,33}

Data analysis

ActiLife, version 6 (ActiGraph LLC, Pensacola, FL) was used to initialize (100 Hz) and download activity data from the GT3X+ devices (LFE filter: 1 s, 15 s, and 60 s epochs [blocks of time]). Non-wear periods were defined as intervals of at least 90 consecutive minutes with zero activity counts (allowing for up to 2 consecutive min of counts; 0–100).³⁴ Minimum valid wear time was 10 hours per day.³⁵

We determined steps per day using the scoring feature in ActiLife. A customized R program, version 3.2.3 (R Foundation for Statistical Computing, Vienna, Austria), detected short and long walking bouts in the 15-second and 60-second epoch files, respectively. We calculated the duration of a short bout by summing the number of consecutive 15-second epochs that contained five or more steps. Long walking bouts required 30 or more steps per 60-second epoch for 5 or more consecutive minutes (with 1 min drop-time allowed below the 30-steps-per-epoch threshold).

We identified peak 1-minute stepping cadence (steps per minute recorded for the highest single minute in a day) and peak 30-minute stepping cadence (average steps per minute recorded for the 30 highest, but not

necessarily consecutive, min in a day) for each day and averaged across valid days.²¹ We also grouped daily step data into the following cadence bands: 1–19, 20–39, 40–59, 60–79, and 80–99 steps per minute.²⁰

Statistical analysis

We conducted all data processing and analyses using Microsoft Excel 2016 (Microsoft Corporation, Redmond, WA) and SigmaPlot, version 11.0 (Systat Software Inc., Hounslow, UK). We checked all data for normality using the Shapiro–Wilk test. Normal data are presented as mean (SD), and non-normal data are presented as median inter-quartile range (IQR). We used paired *t* tests and Wilcoxon signed-rank tests to compare hospital and home data and Spearman rank-order correlations to determine relationships among steps per day, demographic factors, and measures of mobility (null *r* value = 0). We applied a Bonferroni correction to the *p* value for detecting hospital–home differences in each of the six cadence bands ($0.05/6 = p < 0.008$). For all other comparisons, we used $p < 0.05$ for statistical significance.

RESULTS

Table 1 presents participants' characteristics. Although 32 participants entered the study, data from only 28 participants (22 women, 6 men) were included in the analyses. Four participants had incomplete activity data (2 participants wore activity monitors only in hospital, 1 participant did not meet the wear-time threshold at home, and 1 participant was readmitted 2 days after discharge). The reasons for admission to the geriatric rehabilitation ward were fall or fracture ($n = 23$), neurological condition ($n = 4$), and cardiovascular surgery ($n = 1$). Before admission, 18 participants used wheeled walkers, 1 used a straight cane, and 9 did not use a walking aid. On discharge, 26 participants used wheeled walkers to ambulate, 1 used a straight cane, and 1 used a quad cane. The median number of sit-to-stand transitions completed in 30 seconds for the entire group was three. However, 12 participants were unable to rise from the chair even once. The median number of transitions for the 16 participants who were able to perform the movement was 5 (IQR = 4). From our sample, 12 people went home to an apartment or condominium, 9 to a house, and 7 to assisted living. The majority were discharged with home care supports ($n = 25$) and recommendations to attend day hospital ($n = 17$). Twelve individuals who lived in an apartment, condominium, or house lived alone, but almost all participants ($n = 27$) reported that they had family or friends who regularly helped them at home.

We defined a clinically important change as an increase or decrease of 1,000 steps per day at home compared with walking in hospital. On the basis of this definition, there were 10 responders (6 went home to an apartment, 2 to a house, and 2 to assisted living) and 3

Table 2 Activity Monitor Data

Variable	Mean (SD)*		Difference, mean or median (95% CI)	Test statistic	df	p-value
	Hospital	Home				
Median (IQR) wear time/d, h	12.3 (1.4)	12.5 (2.4)	0.1 (−0.72, 1.49)	$Z = 0.763$	–	0.45
Median (IQR) no. of valid wear days	5.0 (0)	5 (0)	0 (0, 0)	$Z = 0.535$	–	0.64
Median (IQR) steps/d	3,456 (1,800)	3,914 (2,581)	401 (−364, 1,215)	$Z = 1.640$	–	0.10
Peak 1-min cadence, steps/min	79 (17)	69 (14)	−10 (−15, −5)	$t = 3.817$	27	<0.01
Peak 30-min cadence, steps/min	52 (15)	45 (14)	−7 (−11, −3)	$t = 3.637$	27	<0.01
Median (IQR) no. of short walking bouts/d	37 (19)	57 (47)	24 (14, 36)	$Z = 3.985$	–	<0.01
Duration of short walking bouts/day, s	84 (17)	61 (13)	−23 (−28, −18)	$t = 0.014$	27	<0.01
Median (IQR) no. of long walking bouts/d	1 (1)	1 (3)	−0.2 (−0.6, 0.2)	$Z = −0.534$	–	0.60
Duration of long walking bouts/d, min	12 (4)	6 (4)	−5 (−7, −3)	$t = 5.705$	27	<0.01
Longest walk in 5 d, min	22 (11)	13 (8)	−10 (−14, −6)	$t = 4.662$	25	<0.01
Longest walk in 5 d, steps	1,157 (789)	758 (585)	−414 (−678, −150)	$t = 3.229$	25	<0.01

*Unless otherwise indicated.

Note: Analyses included paired t tests – normal data expressed as mean (SD) – and Wilcoxon signed-rank tests – non-normal data expressed as median (IQR).

Dash indicates not applicable.

IQR = inter-quartile range.

Table 3 Cadence Bands

Cadence band, steps/min	Median (IQR)		Difference, median (95% CI)	Z	p-value
	Hospital, min/d	Home, min/d			
1–19	224 (7)	227 (81)	11 (−28, 45)	−0.455	0.66
20–39	34 (22)	48 (33)	23 (14, 31)	3.598	<0.001
40–59	17 (11)	9 (17)	−2 (−6, 5)	−0.205	0.85
60–79	8 (6)	3 (9)	−2 (−8, −1)	−2.691	0.007
80–99	0 (3)	0 (1)	0 (−0.4, 0)	−1.670	0.10
≥100	0 (0)	0 (0)	0 (0, 0)	−1.541	0.13

Note: Wilcoxon signed-rank tests were performed. A Bonferroni correction was applied to the p value to detect differences in the six cadence bands ($0.05/6 = p < 0.008$).

IQR = inter-quartile range.

non-responders (2 were discharged to an apartment and 1 to a house). The remaining 15 participants did not show an increase or a decrease of 1,000 steps or more per day. We lacked the power to perform statistical tests, but there were no substantial differences in age, FIM score, number of medications, BMI, TUG test, gait speed, sit-to-stand results, or the time between assessment and discharge home among those participants who increased by 1,000 or more steps per day and those who decreased by 1,000 or more steps per day.

Table 2 details activity monitor data. There were no differences between hospital and home steps per day or the number of long walking bouts per day. However, peak 1-minute cadence and peak 30-minute cadence were greater in hospital than at home. The median number of short walking bouts per day was greater at home than in hospital, but the duration of short walks was, on average, 23 seconds longer in hospital than at home. Similarly, both the daily long walking bouts and the longest walk taken over the 5-day period were greater

in hospital than at home. Although peak cadence values were greater in hospital, our analyses produced few differences in walking by cadence bands (see Table 3). Participants spent an additional 23 minutes per day walking at 20–39 steps per day at home compared with in hospital, whereas they spent an additional 2 minutes per day walking at 60–79 steps per day in hospital compared with at home.

The number of steps per day in hospital was correlated with sit-to-stand transitions ($r_s = 0.43$; $p = 0.02$; 95% CI: 0.06, 0.69), but it was not related to age, number of medications, BMI, gait speed, FIM, or TUG test. Steps per day at home was also correlated with sit-to-stand transitions ($r_s = 0.53$; $p < 0.01$; 95% CI: 0.19, 0.75) and TUG test score ($r_s = −0.42$; $p = 0.03$; 95% CI: −0.68, 0.05), but it was not related to age, number of medications, BMI, gait speed, or FIM scores. The number of steps per day recorded in hospital and at home were moderately correlated ($r_s = 0.59$; $p < 0.01$; 95% CI: 0.26, 0.78).

DISCUSSION

This study is the first to compare steps per day, walking bouts, and cadence data in hospital and on discharge among older adults in geriatric rehabilitation. Contrary to our hypothesis, we found no difference in steps per day in hospital and at home. However, the patterns of walking differed between the two locations. People took longer walks and reached higher peak-cadence levels in hospital, whereas they had more short walking bouts at home. These findings underscore the importance of measuring walking performance among older adults in different settings.

The therapeutic, social, and physical environments in geriatric rehabilitation may encourage patients to walk longer distances at faster paces than at home. There may also be other factors in the home environment that make it difficult for older adults to ambulate (e.g., less space to use walking aids, low furniture without adequate armrests to facilitate standing from sitting). Although individuals discharged to assisted living facilities usually have to walk farther for meals than people living in a house or apartment, only 2 of the 10 participants who increased their walking by 1,000 or more steps per day were discharged to assisted living facilities. Several factors influence walking behaviour on transition back into the community. On the basis of our results, therapists should encourage patients to maintain a similar intensity of activity at home after they are discharged from geriatric rehabilitation and problem-solve with them to determine how and where this can be achieved (e.g., by attending a community programme, finding a location suitable for safe walking, identifying a buddy to walk with).

Participants in our study took substantially more steps per day than those in studies of older adults in acute care (3,456 vs. 330–850 steps/d).^{3,7,9} This is likely related to the emphasis on physical therapy and walking for patients in geriatric rehabilitation. In addition, geriatric rehabilitation patients tend to be less acutely ill and typically spend 6 weeks on the ward progressing with rehabilitation, compared with an average length of stay of less than 1 week in acute care.^{3,7,9} Despite this emphasis on walking during in-patient rehabilitation, these individuals still only achieve about half the daily recommended level of 7,000–10,000 steps per day for healthy, older adults.³⁶

Steps per day was correlated with the ability to complete sit-to-stand transitions and the TUG test, but it was not related to age, medications, BMI, gait speed, or FIM score. This finding underscores the functional relationship between components of the TUG test and walking performance³⁷ as well as the importance of including lower extremity strength and power exercises in rehabilitation programmes for older adults.^{38,39}

Previous work has demonstrated the influence of sampling epoch and bout definition in describing activity

patterns.²⁴ In general, short epochs are recommended to accurately reflect walking among people who are relatively inactive.²⁴ We chose to use 15-second and 60-second epochs to capture short and long walking bouts, respectively. To date, few researchers have analyzed activity bout data for older adults. Some findings have been reported for people with stroke, but definitions of bout differ among studies, making it difficult to compare results.^{22,24,25} Although the ages and diagnoses of participants in those studies, as well as the definitions of walking bout, differed slightly from ours, the cohorts were similar in terms of steps per day and the relative lack of long walking bouts (1–2 bouts/d >300 steps or >5 min in duration).

Participants in our study may have engaged in more short bouts of activity at home because of an increased need to stand and walk for self-care activities and household chores. Engaging in longer bouts of activity may have been more difficult if they did not have the physical space to walk for long distances or if they did not feel comfortable walking in the available space. It is interesting that healthy, younger individuals also infrequently engage in walking bouts during daily life that last more than 3–4 minutes.⁴⁰ However, the consequences of not regularly engaging in continuous activity are more serious in older adults because exercise tolerance levels are closely linked to maintaining independence in daily life.⁴¹

Despite the fact that mean gait speed for our sample was only 0.6 (SD 0.2) metres per second (which suggests limited capacity for ambulation in the community),⁴² the majority of our participants ($n = 21$) were discharged to homes or apartments, and the remainder ($n = 7$) went to assisted living facilities. Gait speeds below 0.6–0.7 metres per second are commonly seen in hospitalized older adults.^{43,44} It is important that therapists recognize the functional implications of limited gait speeds⁴² during both in-patient and outpatient rehabilitation and attempt to address difficulties related to safe ambulation in the community.

We also measured cadence in our study. This is a measure related to gait speed that has been infrequently reported in patient populations. In hospital, participants in our study registered peak 1-minute and peak 30-minute cadence values similar to those collected in people aged 70 years or older in the National Health and Nutrition Examination Survey (NHANES; 79 and 52 steps/min, respectively, compared with NHANES values of 82 and 53 steps/min).²¹ However, peak 1-minute and 30-minute cadence values were significantly lower once people were discharged. Again, this may reflect changes in the physical environment or a reduced emphasis on taking purposeful walks at home.

In terms of analyses of time spent across different cadence bands, we found no differences, except that

participants spent an additional 23 minutes per day walking at 20–39 steps per minute at home and an additional 2 minutes per day walking at 60–79 steps per minute in hospital (see Table 3; Bonferroni correction applied). The amount of time spent in all cadence bands was substantially lower than values reported in NHANES;²⁰ however, NHANES participants were younger (aged ≥ 60 years) than the individuals in our study. The fact that peak-cadence measures were not maintained when patients went home, and that walking at all cadence levels was generally low, is important because self-selected walking speed, daily ambulatory activity, and functional independence are closely related.^{45,46}

Our findings are relevant for several reasons. First, transition periods—in particular, discharge home—are high-risk periods for readmission, emergency department visits, and death among older adults.^{47,48} Understanding functional status and mobility through the transition is important when planning individual care as well as when planning health care services. Therapists should encourage patients to consider the activity levels they attained in hospital and help them determine how they can maintain or improve their mobility after they are home to prevent subsequent decline. Although our findings that walking volume does not decline markedly immediately after discharge may be reassuring, the consequences of taking shorter walks at a slower pace (at home) require further study. We also note that it may be important and relevant for patients to be encouraged to take more frequent short walks in hospital (similar to what people do at home); however, this activity should not be at the expense of taking longer, faster walks. Additional research is needed into models of care to facilitate continued rehabilitation in community settings in the longer term. Despite the fact that these models of care have a long history and a solid evidence base for maintaining functional status and mobility in older adults, they have not yet been universally adopted.^{47,49}

Second, functional status is a very strong predictor of adverse outcomes (including hospital readmission) after discharge.^{50,51} Measuring mobility may be an important ancillary measure for predicting these adverse outcomes and targeting appropriate follow-up. Compared with invasive testing, these measures are not particularly unpleasant, difficult, or expensive, and they may add information to other measures of functional status.

This is the first study to document and compare objectively measured walking between hospital and home among older adults admitted to geriatric rehabilitation. The activity monitor and analysis techniques we used are known to be accurate in detecting steps in older adults who walk at slow speeds,^{32,33} and data were analyzed using different epochs to detect short and long walking bouts.

However, our study had several limitations. First, because we required participants to be cognitively intact,

to have good memory capability (MMSE ≥ 25), and to be able to ambulate independently on the ward, our sample had fewer comorbidities and higher functional status than many patients admitted to geriatric rehabilitation. This may limit the generalizability of our findings. In addition, to make the study feasible and limit the burden on our participants, we monitored them for just 5 days in hospital and at home. Although we attempted to measure walking for 5 days during the last 2 weeks before discharge, some participants' discharge was delayed, and we do not know whether their level of ambulation changed during the weeks between hospital assessment and discharge home. However, of the 11 participants whose discharge was delayed more than 2 weeks, 4 showed an increase in steps per day of more than 1,000 at home compared with hospital, 2 reduced their walking by more than 1,000 steps per day at home, and 5 changed by fewer than 1,000 steps per day.

A final limitation is that because participants wore the monitor for only 5 days at home, we do not know whether speed or duration of walking changed after they had been home for a longer period. Although 19 participants used walking aids at home before admission, all 28 were discharged with a walking aid. We do not know whether everyone consistently used their walking aid at home. Ambulating without a recommended aid could result in slower walking speeds.

CONCLUSION

Patients nearing the end of their stay in geriatric rehabilitation take a similar number of steps per day, compared with walking at home, in the early stages after discharge. However, people tend to take longer walks and walk at a faster pace in hospital; this means that they may find it difficult to continue to improve, or even maintain, exercise tolerance levels after they go home. This finding should be examined in more detail in future studies to determine the trajectory of walking behaviours over a longer time after discharge from a prolonged hospitalization. Older adults who are unable to continue walking at speeds and distances achieved in hospital may demonstrate reduced mobility and have an increased need for assistance with their activities of daily living. Many of these individuals may benefit from continued supervised rehabilitation in the community (e.g., day hospital) or other community-based programmes or initiatives, along with education (for the patient and family) about the importance of trying to facilitate longer bouts of walking at a comfortable pace in safe environments.

KEY MESSAGES

What is already known on this topic

Regular, daily walking plays an important role in maintaining mobility and function. Older adults in acute care take only 10%–20% of the steps per day usually taken in the community, and ambulation on discharge

predicts readmission more than age, previous functional status, or length of hospital stay. Although walking is a focus in geriatric rehabilitation, ambulation levels in hospital and after discharge have not been studied.

What this study adds

Steps per day pre- and post-discharge from geriatric rehabilitation were similar. However, people took longer walks and walked at a faster pace in hospital, and they engaged in more frequent, short walks on discharge home. Participation in outpatient rehabilitation or other community-based programmes that focus on walking safely at faster speeds and for longer distances may help older adults maintain levels of exercise tolerance and mobility after prolonged hospitalization.

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