

ORIGINAL ARTICLE

Comparison of Discharge Functional Status After Rehabilitation in Skilled Nursing, Home Health, and Medical Rehabilitation Settings for Patients After Hip Fracture Repair



Trudy Mallinson, PhD, OTR/L,^{a,b} Anne Deutsch, PhD, CRRN,^{b,c,d,e}
Jillian Bateman, OTD, OTR/L,^d Hsiang-Yi Tseng, MA, OTR/L,^d Larry Manheim, PhD,^{b,e}
Orit Almagor, MA,^{b,e} Allen W. Heinemann, PhD, ABPP^{b,d,e}

From the ^aDivision of Occupational Science and Occupational Therapy, University of Southern California, Los Angeles, CA; ^bDepartment of Physical Medicine and Rehabilitation, Feinberg School of Medicine, Northwestern University, Chicago, IL; ^cRTI International, Waltham, MA; ^dRehabilitation Institute of Chicago, Chicago, IL; and ^eCenter for Healthcare Studies, Northwestern University, Chicago, IL.

Abstract

Objective: To examine differences in rehabilitation outcomes across 3 post-acute care (PAC) rehabilitation settings for patients after hip fracture repair.

Design: Prospective, observational cohort study.

Setting: Six skilled nursing facilities (SNFs), 4 inpatient rehabilitation facilities (IRFs), and 8 home health agencies (HHAs) in 10 states.

Participants: Patients (N=181) receiving PAC rehabilitation following hip fracture with internal fixation (n=116) or total hip replacement (n=64), or no surgical intervention (n=1).

Interventions: Not applicable.

Main Outcome Measure: Self-care and mobility status at PAC discharge measured by the Inpatient Rehabilitation Facility Patient Assessment Instrument.

Results: IRF and HHA patients had lower self-care function at discharge relative to SNF patients controlling for patient characteristics, severity, comorbidities, and services. Adding length of stay (LOS) resulted in nonsignificant differences between IRFs and SNFs. In contrast, there was no setting-specific advantage in discharge mobility for patients with or without the addition of LOS. The average LOS of HHA patients was 2 weeks longer than that of SNF patients, whose average LOS was 9 days longer than that of IRF patients (average, 15d). IRF and SNF patients received about the same total minutes of therapy over their PAC stays (~2100min on average), whereas HHA patients received only approximately 25% as many minutes.

Conclusions: Setting-specific effects varied depending on whether self-care or mobility was the outcome of focus. It remains unclear to what extent rehabilitation intensity or natural recovery effects changes in functional status for patients with hip fracture. This study points to important directions for PAC setting comparative effectiveness studies in the future, including uniform measurement, limited consensus on factors affecting recovery, accounting for selection bias, and using end-point data collection that is at the same follow-up time periods for all settings.

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Hip fracture is a common and serious event among older adults. There were more than 264,000 hospital discharges for hip fractures among adults 65 years and older in 2007¹; 13.5% died within 6 months and 12.8% needed total assistance.² Although hip fracture rates and subsequent mortality are declining in the United States,^{3,4} levels of disability remain high.⁵ Patients with hip fracture are high users of post-acute care (PAC) services. In 2008, 95.4% of those receiving hip or femur procedures (exclusive of

joint replacement procedures) received PAC services.⁶ On average, patients made 3.5 care transitions among PAC providers after acute hospital discharge.⁷ Yet evidence supporting which PAC rehabilitation services maximize functional outcomes for which patients following hip fracture repair remains limited.

Where patients with hip fracture receive rehabilitation services depends on multiple factors including the availability of providers, hospital relations, bed availability, physician referral patterns, patient preferences, and availability of family support.⁸ Most patients with hip fracture have access to skilled nursing facility (SNF) and home health agency (HHA) services, and many live in areas with access to inpatient rehabilitation facilities (IRFs).⁹ All PAC settings provide rehabilitation services but with varying therapy intensity and degrees of medical support.

There is limited evidence regarding the comparative effectiveness of PAC settings for these patients. Studies completed before the implementation of the Prospective Payment System found no advantage for patients with hip fracture admitted to IRFs versus SNFs in function at discharge¹⁰ or the number of daily activities recovered at 6 months¹¹ but did find an advantage for IRF and HHA patients compared with SNF patients for function at 6 weeks postdischarge.¹²

Studies are also equivocal after the implementation of PAC Prospective Payment System. Munin et al¹³⁻¹⁵ reported an advantage in recovery of function for patients admitted to IRFs versus SNFs. However, 2 of these studies were small and conducted at a single provider. A study using Medicare data⁸ found an advantage for SNF patients compared with IRF patients for mortality and return to the community but did not examine functional status. An analysis of patients with a joint replacement following hip fracture¹⁶ compared function over the entire PAC episode for patients who initiated care in an IRF or SNF; investigators found a disadvantage for all SNF-initiated and IRF+SNF patterns of services versus IRF+HHA. However, this study did not examine episodes that started with HHA.

This study builds on previous research by examining changes in self-care and mobility following rehabilitation across 3 PAC settings and includes geographically diverse providers. The goal was to examine differences in outcomes across 3 PAC settings for patients with hip fracture. Study questions were as follows:

1. How do patients with hip fracture vary on key demographic and clinical factors at admission across PAC settings?
2. How are self-care and mobility function at discharge related to the type of PAC provider, after controlling for patient demographic, function, and clinical characteristics at baseline, and time from surgery?

Methods

Study design

We recruited 4 IRFs, 6 SNFs, and 8 HHAs for this prospective cohort study. We recruited patients from December 2005 through

List of abbreviations:

HHA	home health agency
IRF	inpatient rehabilitation facility
LOS	length of stay
OT	occupational therapy
PAC	post-acute care
SNF	skilled nursing facility

March 2010. The institutional review boards of Northwestern University and each of the providers approved the study. A study nurse obtained consent from patients; next of kin or a legally authorized representative provided consent for patients with cognitive impairments. We described the facilities, patient selection, and data collection procedures in an earlier report.¹⁷

Facilities

We recruited facilities from Listserv postings and referrals from colleagues. Facilities were mostly in Eastern and Midwestern regions. We sought facilities that had sufficient volume to complete data collection in a timely manner.

Patient selection

Eligibility criteria were as follows: 1) admission to PAC following surgery for a hip fracture including both open-reduction internal fixation or total joint replacement, 2) age 65 years or older, 3) Medicare fee-for-service as the primary insurance, 4) admission directly from an acute care hospital, and 5) receipt of rehabilitation services including at least physical therapy or occupational therapy (OT). Two additional criteria—6) receipt of PAC services since acute care hospital discharge and 7) Medicare managed care as a primary payer—were also added to facilitate patient recruitment. Our revised criteria included HHA patients who received care at an IRF or SNF after acute care discharge. We recruited 191 patients. Two patients were excluded because of incorrect procedures, and 8 subjects were readmitted to acute care for more than 48 hours (SNF:5; HHA:3). A final sample of 181 patients is reported (SNF:69; IRF:78; HHA:34).

Patient characteristics

We extracted information on demographics (sex, race, and age), social support (marital status, living location, and living situation), time from surgery, type of surgical repair, number of comorbidities, and bowel and bladder continence. We documented specific comorbidities that may affect patients' ability to engage in and benefit from rehabilitation, specifically, obesity, visual impairment, anemia,¹⁸ diabetes,¹⁹ pressure ulcers,²⁰ mood disorders,²¹ and cognitive skills (short- and long-term memory, daily decision making) using the Minimum Data Set 2.0 items. We recoded memory items dichotomously, indicating the presence or absence of memory problems. We also dichotomized decision making and bowel and bladder continence as independent or not. Nurses extracted up to 10 comorbidities from the medical record.

Therapy measures

Nurses documented the PAC length of stay (LOS), the number of minutes of each therapy documented in the medical record, and discharge destination. We calculated days from surgery as the number of days from acute hospital admission to PAC admission. We collected data on the receipt of OT, physical therapy, speech language pathology, psychology, and other disciplines. *Number of therapy days* is the number of days a patient received therapy from that discipline. *Total therapy minutes* is the sum of therapy minutes received from all disciplines. *Discipline intensity* is defined as discipline-specific therapy minutes divided by the number of days on which that therapy occurred. We calculated an

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