Mortality and Locomotion 6 Months After Hospitalization for Hip Fracture
Risk Factors and Risk-Adjusted Hospital Outcomes

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Context  Hip fracture is a common clinical problem that leads to considerable mortality and disability. A need exists for a practical means to monitor and improve outcomes, including function, for patients with hip fracture.

Objectives  To identify and compare the importance of significant prefracture predictors of functional status and mortality at 6 months for patients hospitalized with hip fracture and to compare risk-adjusted outcomes for hospitals providing initial care.

Design  Prospective study with data obtained from medical records and through structured interviews with patients and proxies.

Setting and Participants  A total of 571 adults aged 50 years or older with hip fracture who were admitted to 4 New York, NY, metropolitan hospitals between August 1997 and August 1998.

Main Outcome Measures  In-hospital and 6-month mortality; locomotion at 6 months; and adverse outcomes at 6 months, defined as death or needing assistance to ambulate, compared by hospital, adjusting for patient risk factors.

Results  The in-hospital mortality rate was 1.6%. At 6 months, the mortality rate was 13.5%, and another 12.8% needed total assistance to ambulate. Laboratory values were strong predictors of mortality but were not significantly associated with locomotion. Age and prefracture residence at a nursing home were significant predictors of locomotion ($P = .02$ for both) but were not significantly associated with mortality. Adjustment for baseline characteristics either substantially augmented or diminished interhospital differences in outcomes. Two hospitals had 1 outcome (functional status or mortality) that was significantly worse than the overall mean while the other outcome was nonsignificantly better than average.

Conclusions  Mortality and functional status ideally should be considered both together and individually to distinguish effects limited to one or the other outcome. Hospital performance for these 2 measures may differ substantially after adjustment, probably because different processes of care are important to each outcome.

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of clinical problems; however, much of this research has focused on risk-adjusted mortality or complications. In recent years, measures of patient functional outcomes have been proposed as a means to assess the effectiveness and quality of care, but the research on risk-adjusted functional outcomes is limited. For many clinical problems, using functional outcomes in this way has been complicated by the possibly delayed impact of medical care on functional outcomes and the difficulty of identifying an appropriate time period for assessing baseline function in patients with chronic conditions. These issues are less of a problem for patients with hip fracture.7 For hip fracture, studies have identified the patient factors related to the recovery of functional status or mortality.2,5-31 However, the vast majority of these studies have considered function or mortality independently, and none has reported on how risk-adjusted outcomes could be obtained to assess the effectiveness or quality of care.

The objectives of this study are (1) to develop and test statistical models that identify significant risk factors for 6-month mortality and compromised functional status for patients with hip fracture; (2) to examine alternative ways for risk-adjusting the outcomes of function and mortality for a clinical problem for which both outcomes are clearly important and neither can be meaningfully ignored; and (3) to compare the risk-adjusted outcomes by the hospital providing initial care.

METHODS

Subjects

Patients hospitalized for hip fracture between August 1997 and August 1998 in 4 hospitals in the New York metropolitan area were eligible for the study. Exclusions consisted of patients who were younger than 50 years; whose fracture occurred as an inpatient; who were transferred from another hospital; or who sustained concurrent major internal injuries, pathological fractures, fractures not limited to the pelvis or acetabulum, fractures 2 cm or more below the trochanter, bilateral hip fractures, prior surgery on the same hip, or previous ipsilateral hip fracture.

A total of 804 patients with hip fracture were admitted to the 4 hospitals. Of these patients, 650 (81%) met the eligibility criteria, and 571 (88%) of those patients gave informed consent for participation in the study.

Data Collection

A variety of patient characteristics and risk factors were collected from medical records and patient or proxy interviews during and after hospitalization for hip fracture. Information obtained through these interviews included the patient’s functional status and type of residence prior to the fracture, as well as whether the patient suffered from dementia or had a paid helper in his/her home prior to the fracture. Medical records were used to capture comorbid conditions, vital signs, laboratory value indicators, demographics, and the presence of dementia.

After discharge from the hospital, functional status information was obtained by interviewers at 6 months. For cognitively compromised patients, alternate respondents who were most familiar with the patient (usually a spouse or close relative) were identified and interviewed to obtain information about the patient’s functional status before and after the fracture. Prior studies indicate that proxies can provide reliable estimates for the areas of physical function measured in this study.30,32,33

Patient Characteristics and Predictors of Outcome

The independent variables that were explored in the study included demographic measures (age, sex, race), prefracture locomotion, reliance on help from others prior to fracture (nursing home residence, paid helper at home), dementia, presence of chronic medical conditions, physiological function, type of fracture/displacement (femoral neck/displaced, femoral neck/ nondisplaced, intertrochanteric), and type of procedure (hemiarthroplasty, internal fixation). Prefracture locomotion was measured by eliciting information for the locomotion subscale of the Functional Independence Measure (FIM)23-26 relative to function just prior to the fracture.

The impact of chronic conditions was measured by modifying the RAND morbidity score27 to tailor the relative importance of each condition to outcomes for patients with hip fracture (available from the authors on request). Also, a modified APACHE (Acute Physiology and Chronic Health Evaluation) score29 (without Glasgow Coma Scale, which was not considered relevant for patients with hip fracture) was used to capture the impact of patients’ vital signs, laboratory studies, and mental status on outcomes.

Outcome Measures

There were 3 outcomes of interest in the study, each measured at 6 months following hospitalization: mortality, locomotion, and adverse outcome (defined as mortality or needing total assistance to ambulate).

Locomotion (ability to walk and climb stairs) was measured using a modified version of the locomotion subscale of the FIM, which rates the patient’s independence in traveling 45 m (150 ft) walking or in a wheelchair and in going up and down 12 to 14 stairs.23-26 Each of the measures in the locomotion subscale (walking, climbing stairs) is scored from 1 to 7, with 1 indicating a patient requiring total assistance and 7 indicating a completely independent patient. Thus, the total locomotion score ranges from 2 to 14, with higher scores being indicative of better functioning. “Needling total assistance to ambulate,” which is part of one of the outcome measures used in the study, was defined as needing total assistance from another person to walk 45 m (150 ft).

Data Analysis

The relationships between several available patient risk factors and each of the outcomes were examined using χ² tests. Patient risk factors, which were collected at admission based on patient status prior to the fracture, included age,
sex, race, functional status (locomotion subscale of FIM), dementia, admission from a nursing home, paid helper required to care for the patient, modified APACHE score, and modified RAND comorbidity score. Next, relationships between the entire group of risk factors and the outcome measures were explored. For postfracture locomotion, the relationship with the group of patient risk factors was examined using a multiple linear regression model, with locomotion subscale at 6 months as the dependent variable. Fit of the model was assessed using the $R^2$ value, and the significance of each independent variable was assessed using the t statistic for the variable. The model included only patients who were alive at 6 months. For the 2 binary outcome measures, the multivariate relationship with patient risk factors was examined using multiple logistic regression models. The binary dependent variable was the presence or absence of the outcome, and the independent variables were the same ones used in the linear regression models above. Model fit was assessed using the C statistic to measure each model’s discrimination, and the Hosmer-Lemeshow statistic was used to measure its calibration. A proportional hazards model that predicts time until death was also used and yielded results that were very similar to those of the logistic regression model. Independent variables used in all of the models included those mentioned above in the univariate analyses. Age, locomotion subscale, modified RAND comorbidity score, and modified APACHE score were treated as continuous variables. A quadratic term was tested for age, but it proved not to be significant. Also, age categories were used in lieu of a continuous measure, but they yielded a worse model fit (eg, $R^2$ value for the linear regression models) than the linear term for age. Interactions between age and sex were also tested and were found not to be statistically significant. Use of long-term care services was treated as a variable with 3 categories (admission from a nursing home, paid helper required to care for the patient at home prior to the fracture, and all other [the reference category]).

The next stage of the data analyses consisted of adding an indicator (dummy) variable for 3 of the 4 hospitals to each of the statistical models described above. This was done to assess the performance of each hospital with regard to each outcome measure after adjusting for differences in patient severity of illness prior to the hip fracture. The hospital dummy variables were coded using effects rather than reference coding so that each hospital’s performance could be compared with the overall average performance rather than the performance of an arbitrarily chosen reference hospital. P values were used to identify the significance of each hospital’s deviation from the overall average performance, and the correspondence of each hospital’s performance across all outcome measures was examined. Statistical significance was set at $P<.05$.

In an effort to explore the reasons for outcome differences among hospitals, we explored whether the differences could be explained by choice of discharge destination or type of surgical procedure. We first added discharge destination (home, nursing home, acute rehabilitation hospital) to the statistical models to determine if destination was a significant predictor of each of the 3 outcomes, and to determine if interhospital outcome variations would be diminished when controlling for discharge destination. When we proceeded to examine the effect of surgical procedure, we found that internal fixation was used for nearly all (95%) of intertrochanteric fractures. Also, displaced femoral neck fractures were usually (90% of the time) treated with arthroplasty, and nondisplaced femoral neck fractures were almost always treated with internal fixation. Consequently, it was impossible to include both the fracture characteristics and type of surgery in the models because there was not sufficient variation in the choice of treatment. To examine the significance of fracture type/procedure type, we designated intertrochanteric fracture as the reference category and defined femoral neck fracture/internal fixation and femoral neck fracture/ hemiarthroplasty as indicator variables in the models. Statistical analyses were conducted with SAS version 6.12 (SAS Inc, Cary, NC).

**RESULTS**

**Relationship Between Individual Patient Risk Factors and Outcomes**

The in-hospital mortality rate was 1.6%, the 6-month mortality rate was 13.5%, and the 6-month adverse outcome (dead or needing total assistance to ambulate) was 26.3%. Of the patients who died within 6 months after admission, the percentages who died each month were 20%, 10%, 20%, 17%, 13%, and 20%, respectively. The mean locomotion score at 6 months for survivors was 8.06 (SD=4.01).

**Table 1** presents the relative frequencies of patient risk factors and their bi variate relationships with the 3 outcome measures. Of the patients with hip fracture in the study, 81% were women and 92% were white; prior to the fracture, 12% resided in a nursing home, 36% had a paid helper in the home, and 25% had dementia. Significant risk factors for mortality were race, presence of dementia, type of fracture/displacement, use of long-term care services, pre fracture function, RAND score, and APACHE score. All of those risk factors were also significantly related to adverse outcome except sex, the APACHE score, and type of fracture/displacement. Locomotion scores were significantly different by use of long-term care services, dementia, type of fracture/displacement, function, comorbidity, RAND score, and age.

**Prediction of Outcomes**

**Table 2** presents the results of a linear regression model that predicts the FIM locomotion subscale on the basis of several prefracture patient risk factors. The $R^2$ value was .38 and the only significant predictors of postfracture locomotion were prefracture locomotion...
Table 1. Hip Fracture: Baseline Patient Characteristics and Their Relationship to Outcomes*

<table>
<thead>
<tr>
<th>Patient Characteristic (Categorical Measure)</th>
<th>Mortality</th>
<th>Adverse Outcome</th>
<th>Locomotion†</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Patients, No. (%)</td>
<td>Rate at 6 mo, %</td>
<td>P Value</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>106 (18.6)</td>
<td>18.87</td>
<td>.07</td>
</tr>
<tr>
<td>Female</td>
<td>465 (81.4)</td>
<td>12.26</td>
<td></td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>525 (91.9)</td>
<td>12.57</td>
<td>.03</td>
</tr>
<tr>
<td>Other</td>
<td>46 (8.1)</td>
<td>23.91</td>
<td></td>
</tr>
<tr>
<td><strong>Use of long-term care services</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nursing home</td>
<td>67 (11.7)</td>
<td>23.88</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Paid helper in home</td>
<td>207 (36.3)</td>
<td>12.10</td>
<td>.02</td>
</tr>
<tr>
<td>Neither of the above</td>
<td>297 (52.0)</td>
<td>6.73</td>
<td></td>
</tr>
<tr>
<td><strong>Dementia</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>141 (24.7)</td>
<td>24.11</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>No</td>
<td>430 (75.3)</td>
<td>10.00</td>
<td></td>
</tr>
<tr>
<td><strong>Type of fracture/procedure</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Femoral neck/hemiarthroplasty</td>
<td>186 (32.6)</td>
<td>17.20</td>
<td>.05</td>
</tr>
<tr>
<td>Femoral neck/internal fixation</td>
<td>93 (16.3)</td>
<td>6.45</td>
<td></td>
</tr>
<tr>
<td>Intertrochanteric</td>
<td>292 (51.1)</td>
<td>13.36</td>
<td></td>
</tr>
<tr>
<td><strong>Age, y</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;75</td>
<td>106 (18.6)</td>
<td>9.43</td>
<td>.14</td>
</tr>
<tr>
<td>75-84</td>
<td>218 (38.2)</td>
<td>11.93</td>
<td></td>
</tr>
<tr>
<td>≥85</td>
<td>247 (43.3)</td>
<td>16.60</td>
<td></td>
</tr>
<tr>
<td><strong>RAND comorbidity score</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-1</td>
<td>215 (37.7)</td>
<td>8.4</td>
<td></td>
</tr>
<tr>
<td>2-3</td>
<td>183 (32.1)</td>
<td>12.6</td>
<td>.02</td>
</tr>
<tr>
<td>4-15</td>
<td>173 (30.3)</td>
<td>20.8</td>
<td></td>
</tr>
<tr>
<td><strong>APACHE score</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-2</td>
<td>297 (52.0)</td>
<td>11.1</td>
<td>.02</td>
</tr>
<tr>
<td>3-5</td>
<td>208 (36.4)</td>
<td>13.5</td>
<td></td>
</tr>
<tr>
<td>6-12</td>
<td>66 (11.6)</td>
<td>24.2</td>
<td></td>
</tr>
<tr>
<td><strong>Prefracture locomotion</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independent or used device</td>
<td>281 (49.2)</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>Used personal assistance</td>
<td>180 (30.8)</td>
<td>11.9</td>
<td>.24</td>
</tr>
</tbody>
</table>

*APACHE indicates Acute Physiology and Chronic Health Evaluation.
†Locomotion score ranges from 2 to 14, with higher scores representing better functioning.

(\(P<.01\)), age (\(P=.02\)), and whether patients had resided in a nursing home prior to the fracture (\(P=.02\)).

Table 3 presents the results of a logistic regression model that predicts mortality at 6 months and adverse outcome using the same patient risk factors that were examined in Table 2. The fit of the logistic regression model for mortality was good, with a \(c\) statistic of 0.770 and a \(P\) value for the Hosmer-Lemeshow test of .18. As indicated in Table 2, lower prefracture locomotion, higher modified APACHE score, and paid helper at home prior to the fracture were significantly related to higher mortality at 6 months at the .05 level. The fit of the logistic regression model that predicts adverse outcome (mortality or needing total assistance to ambulate at 6 months) was even better, with a \(c\) statistic of 0.813 and a Hosmer-Lemeshow \(P\) value of .13. The adverse outcome rate at 6 months was 26.3%, with 13.5% of the patients having died and another 12.8% needing total assistance to ambulate. The same 3 patient risk factors as in the mortality model (prefracture locomotion, paid helper at home prior to the fracture, and modified APACHE score) were significant, and dementia was also significantly associated with the outcome.

Outcomes by Hospital

Table 4 presents the unadjusted difference between each hospital's performance and the overall performance as well as the results after adjusting for differences in patient prefracture characteristics by adding indicator variables for the hospitals to the statistical models in Table 2 and Table 3.

Adjustment for baseline patient characteristics either substantially augmented or diminished interhospital differences in outcomes for each of the 4 hospitals. Also, some hospitals performed markedly different with respect to functional status and mortal-

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The combined outcome of death or needing total assistance to ambulate at the end of 6 months demonstrated more accentuated outcomes, with patients in hospital D having significantly lower adjusted odds of dying (OR, 0.34; 95% CI, 0.16-0.72; \( P = .005 \)) and patients in hospital A having an OR of an adverse outcome that remained significant (OR, 2.59; 95% CI, 1.55-4.34; \( P < .001 \)). Without adjustment, the ORs for hospitals D and A were also significant. Hospital B had significantly higher odds before adjustment, but they were no longer significant after adjustment.

When the discharge destination variables were added to the set of independent variables in Table 4 (not shown in the table), the results remained essentially the same for death and the combined outcome of death or needing total assistance to ambulate. For example, the mortality ORs for the 4 hospitals were 1.92 vs 1.83, 1.43 vs 1.21, 0.88 vs 1.04, and 0.42 vs 0.47, respectively. Additionally, the new variables “discharge to acute rehabilitation” and “discharge to nursing home” did not yield significantly different outcomes than “discharge to home.” For locomotion status at 6 months, “discharge to a nursing home” proved to be associated with significantly lower FIM scores than the reference (discharge to home). “Discharge to acute rehabilitation” and “discharge to home” did not have significantly different results from one another. Also, hospital C no longer had significantly lower locomotion status after 6 months after controlling for discharge destination. Thus, hospital C’s locomotion results may be partially explained by the tendency of hospital C to discharge a high percentage of its patients to nursing homes (81% vs 45% for the other hospitals combined). In the case of procedure/fracture type, these variables were not significantly associated with any of the 3 outcomes after controlling for preoperative severity of illness and had no effect on the interhospital differences among these outcomes.

**COMMENT**

We developed statistical models for predicting functional status and mortality, both separately and together, for pa-

### Table 4. Hip Fracture: Comparison of Unadjusted and Risk-Adjusted Outcomes by Hospital at 6 Months*

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Risk</th>
<th>Increase/Decrease in Function</th>
<th>( P ) Value</th>
<th>OR (95% CI) for Mortality ( P ) Value</th>
<th>OR (95% CI) for Adverse Event ( P ) Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Adjusted</td>
<td>0.19</td>
<td>.58</td>
<td>1.92 (1.04-3.57)</td>
<td>.04</td>
</tr>
<tr>
<td></td>
<td>Unadjusted</td>
<td>0.37</td>
<td>.37</td>
<td>1.51 (0.86-2.65)</td>
<td>.15</td>
</tr>
<tr>
<td>B</td>
<td>Adjusted</td>
<td>-0.07</td>
<td>.81</td>
<td>1.43 (0.89-2.30)</td>
<td>.14</td>
</tr>
<tr>
<td></td>
<td>Unadjusted</td>
<td>-0.73</td>
<td>.03</td>
<td>1.84 (1.18-2.87)</td>
<td>.007</td>
</tr>
<tr>
<td>C</td>
<td>Adjusted</td>
<td>-0.69</td>
<td>.005</td>
<td>0.88 (0.53-1.44)</td>
<td>.60</td>
</tr>
<tr>
<td></td>
<td>Unadjusted</td>
<td>-0.88</td>
<td>.003</td>
<td>0.97 (0.62-1.52)</td>
<td>.89</td>
</tr>
<tr>
<td>D</td>
<td>Adjusted</td>
<td>0.56</td>
<td>.11</td>
<td>0.42 (0.16-1.07)</td>
<td>.07</td>
</tr>
<tr>
<td></td>
<td>Unadjusted</td>
<td>1.23</td>
<td>.005</td>
<td>0.37 (0.15-0.91)</td>
<td>.03</td>
</tr>
</tbody>
</table>

*OR indicates odds ratio; CI, confidence interval.
tients with hip fracture. These models were then used to assess hospital outcomes. In the study, patients with hip fracture who were admitted to 4 New York metropolitan hospitals were similar to patients in other studies that were more national in scope. For example, compared with the study by Carson et al involving 20 hospitals in 4 regions of the United States, our patient sample included 81.4% women (vs 78.4%), 46.9% were 80 to 89 years old (vs 43.1%), 91.9% were white (vs 86.5%), 24.7% had dementia (vs 26.1%), and 47.6% had cardiovascular disease (vs 43.1%).

The findings of the study are important in 2 respects. First, significant patient risk factors were identified for 3 outcomes (mortality, functional status, and a combination of the 2; death or needing total assistance to ambulate), and statistical models based on these risk factors were then used to report risk-adjusted hospital outcomes for hip fracture. In fact, for all 3 of the performance measures, there was at least 1 hospital with significantly high or low unadjusted outcomes that did not prove to be statistically significant after adjustment for differences in patient severity of illness. Thus, the study demonstrates that there is a need to risk-adjust when assessing hospital outcomes for hip fracture.

Second, with respect to hospital performance, our study demonstrates that performance on one outcome is not necessarily related to performance on another. As indicated, 1 hospital had a significantly higher risk-adjusted mortality rate but not a significantly worse risk-adjusted functional status. Another hospital had a significantly worse risk-adjusted functional status but not a significantly higher risk-adjusted mortality rate. This indicates that both mortality and functional status measures are needed to adequately assess hospital performance, and that the processes of care that are associated with lower mortality rates are not identical to the processes associated with better functional status.

There are several possible explanations for the hospital-specific results that we observed. The hospitals in our study differed in the baseline characteristics of the patients that were admitted, and it is possible that our models did not fully adjust for differences in these patient characteristics. Our analyses, however, included all the major variables that have been shown in the literature to be associated with poor functional outcomes in hip fracture. Consistent with these other reports, our study found that low levels of function prior to the fracture and older age are predictive of poor postfracture functioning.3,6,13,15,37 and the presence of compromised vital signs low levels of prefracture function are predictive of postfracture mortality.3,16-28 Further, the fit of the prediction models was consistent with that of other multivariate outcome models that have been developed for clinical problems. For these reasons, we do not believe that residual unaccounted differences in the patient populations are a major explanation for the observed hospital differences.

We believe that the differences in outcomes may reflect differences, in part, in the inpatient and postacute care services received by these patients. In the inpatient acute care of these patients, interventions (supported by evidence that ranges from randomized trials to expert opinion) are available to prevent or treat many of the common complications encountered in these patients, including thrombophlebitis, wound infection, urinary tract infections, urinary retention, pressure ulcers, cardiac complications, and delirium. After the acute hospital episode, the typical patient with hip fracture continues to receive postacute rehabilitation services for several weeks in skilled nursing facilities, acute rehabilitation units, home health care programs, or a combination of these, and the hospital to which a patient is initially admitted may have considerable influence on the type of postacute services that are made available. As an example, the percentage of patients discharged to acute rehabilitation facilities varied from 6% to 80% among the 4 study hospitals, and patients with hip fracture who were treated in the 2 hospitals discharging the largest proportion of patients to acute rehabilitation facilities (80% and 50%) also had higher, but not significantly higher, levels of locomotion at 6 months than patients discharged from the other 2 study hospitals where a much smaller proportion were discharged to this care setting (10% and 6%). Also, we found that the hospital that had significantly lower risk-adjusted locomotion status in this study had a much higher percentage of patients discharged to nursing homes, and when discharge destination was included in the risk-adjustment process, the hospital no longer had a statistically different locomotion status than other hospitals.

This suggests that the hospital’s practice of discharging a high percentage of patients to nursing homes was associated with the lower locomotion of its patients 6 months after discharge. However, these data do not provide definitive evidence of less effectiveness of discharges to nursing homes relative to acute rehabilitation facilities or home. For example, we were not able to determine reliably at the time of hospital discharge whether a patient was sent to a traditional type of nursing home unit or to a subacute type of unit, nor were we able to determine the patient’s ambulatory status on admission to the postacute facility. Our study also did not have sufficient detail about the lengths and nature of postacute rehabilitation sessions. Thus, the information we have on postdischarge rehabilitation is incomplete and limited in detail.

Our findings have implications for ongoing efforts by providers, accrediting agencies, employers, and other parties to better understand and improve outcomes of health care. Specifically, we believe that greater attention needs to be paid, not only to preventing hip fracture, but also to preventing the mortality and morbidity that results once a patient has fractured a hip—an issue that has not been on the quality improvement agenda of most health care organizations. Hip fractures are common, costly, and have serious health consequences. With changes in the financing and delivery of care in the last 2 decades, this is a clinical problem where care is becoming increasingly fragmented among different settings (hospital, nurs-
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Acknowledgment: We acknowledge the invaluable contributions of our colleagues at the Mount Sinai Medical Center, New York, NY (Christine Cassell, MD, Dempsey Springfield, MD, Arthur Aflues, MD, Cam- berly of subcapital hip fractures. J Am Geriatr Soc. 1997;45:288-294.

Koval KJ, Skovron ML, Aharonoff GB, et al. Ambulatory ability after hip fracture surgery: the effect of early surgery only on mortality. Thus, in re- search, as well as in the management of the 350000 cases of hip fracture annually in the United States, there is a need for collaborative efforts to provide inter- ventions known to be effective, to coordinate the care provided, and to expand the knowledge base of how survival and functional outcomes can be improved.


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