Risk Factors for Discharge to Rehab Among Hip Fracture Patients

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Background/Purpose: Length of stay (LOS) is one of the most powerful drivers of cost in hip fracture surgery. One frequent cause of prolonged LOS is delayed transfer to rehabilitation (rehab) centers following surgery for multiple reasons including lack of appropriate discharge planning or availability of rehab beds. Very little data exist exploring potential predictive factors in determining which patients after hip fracture surgery will require rehab services. Using the recently expanded American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database, this is the first national multicenter study to identify risk factors for discharge to rehab for hip fracture patients.

Methods: A prospective cohort of 7808 hip fracture patients from 2005-2011 were identified in the ACS-NSQIP database using CPT codes 27235, 27236, 27244, and 27245, which represent the spectrum of hip fracture surgery. 5615 patients with available discharge information were included in analysis. Rehab destinations included skilled care (SNF), unskilled facility (USF), separate acute care (SAC), and rehab facility (RF). All other patients were discharged home. Using a multivariate logistic regression analysis, we determined odds ratios for 19 potential risk factors including type of procedure, age, medical comorbidities, American Society of Anesthesiologists (ASA) status, operative time, and baseline functional status.

Results: Of the 5615 hip fracture patients in this analysis, 71.0% were discharged to a rehab facility (SNF 44.3%, n = 2489; USF 0.6%, n = 34; SAC 2.0%, n = 112; RF 24.0%, n = 1349), and 29.0% were discharged home. Of the 19 variables analyzed, 6 were found to be significant risk factors for discharge to rehab. Type of hip fracture procedure was not found to significantly increase the risk of going to rehab ($P = 0.66$). Patients over the age of 65 were 4.25 times more likely to be discharged to rehab than those younger than 65, and females were 1.53 more likely to go to rehab than males ($P < 0.001$). Patients who received general anesthesia were 1.68 times more likely to be discharged to rehab than those who received regional and patients with an ASA score greater than 2 were 3.09 times more likely to be discharged to rehab ($P < 0.001$). Patients who had hypertension were 1.61 times more likely to go to rehab, while patients who needed dialysis were 8.74 times more likely ($P < 0.001$). Patients with poorer preinjury functional status were 1.92 times more likely to go to rehab ($P < 0.001$) (Table).

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Risk Factors for Rehabilitation	Odds Ratio	95% Confid. Interval	
General anesthesia*	1.68	1.26	2.26
Age >65*	4.25	3.00	6.03
Female*	1.53	1.14	2.04
Hypertension*	1.61	1.20	2.15
Dialysis†	8.74	1.16	65.94
ASA status (≤2 vs. >2)*	3.09	2.26	4.21
Preinjury functional status*	1.92	1.36	2.72

*$P < 0.001$. †$P < 0.05$.

Conclusion: In a large prospective series of patients with hip fractures, we demonstrate clear risk factors that predict potential postoperative transfer to rehab centers. Orthopaedic surgeons must utilize such predictors in planning for eventual discharge to rehab. In order to decrease LOS in this patient population, early discharge planning is vital and our study offers unique insight.

See pages 99 - 147 for financial disclosure information.