

Relationship Between the Charlson Comorbidity Index and Cost of Treating Geriatric Hip Fractures: Implications for Bundled Payment

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Background/Purpose: In the last decade, the incidence of hip fractures has dramatically increased, largely due to an aging population. With current costs of treating a hip fracture on the rise, a bundled payment system has been proposed to contain costs by paying hospitals and physicians a single amount for the treatment of a single injury. Prolonged hospital length of stay (LOS) has been identified as a major driver for costs in hip fracture surgery, but few studies have investigated potential predictors of LOS in patients with these injuries. The Charlson Comorbidity Index (CCI), a validated predictor of mortality based on comorbidities, succinctly summarizes a patient's overall health status with a score ranging from 0 (no risk) to 35 (severe risk). The purpose of our study was to assess if a patient's CCI score could be utilized as a tool to predict LOS in geriatric hip fracture patients.

Methods: Through a retrospective chart analysis, patients over 60 years of age presenting with a low-energy hip fracture to a Level I trauma center from January 2000 to December 2009 were identified. Types of surgery included total hip arthroplasty (THA), hemiarthroplasty (hemi), cephalomedullary nailing (CMN), open reduction and internal fixation (ORIF), or closed reduction and percutaneous pinning (CRPP). Data were collected on LOS, age, gender, and comorbid conditions, from which the CCI was calculated. Linear regression analysis was used to evaluate statistical significance of the impact of surgery type on LOS, after controlling for age, gender, and CCI score. Inpatient financial services provided the estimated cost of an inpatient stay (\$4530/night).

Results: Of the 720 charts reviewed, 615 patients met inclusion criteria and were included in analysis. After controlling for age, gender, American Society of Anesthesiologists score, body mass index (BMI), race, smoking status, and anesthesia type with linear regression analysis, patients with an increased CCI score had a statistically significant increased LOS ($P = 0.014$). Compared to patients with a CCI of 0, patients with a CCI score of 1 stayed an average of 0.7 days longer and incurred \$4303.50 more in costs. Patients with a CCI score of 2, on average, had an increased LOS of 1.92 days compared to a patient with a CCI of 0, and incurred \$8697.60 in additional costs.

Conclusion: This is the first study to demonstrate the value of using CCI as a predictor for LOS in geriatric hip patients. The higher CCI scores were shown to correlate with prolonged LOS following treatment for a hip fracture, and subsequently higher hospital costs. This study suggests that the CCI score may be utilized as a valuable tool to predict resource utilization in patients with geriatric hip fractures.

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Figure 1: Mean length of stay per CCI

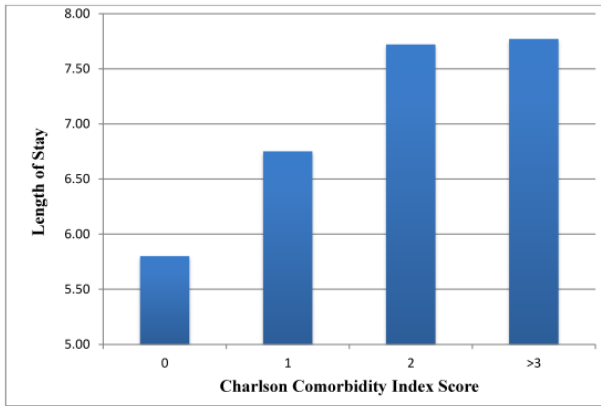


Figure 2: Mean cost of stay per CCI



The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.