

Predictors of Delay for Time to Surgery in Geriatric Hip Fractures:**Results and Outcomes**

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Purpose: It has been shown that a delay to definitive hip fracture surgery can be detrimental to the patient's overall outcome. The purpose of this study was to identify specific variables associated with a delayed time to surgery (>48 hours from admission) for geriatric hip fractures. Additionally, we sought to determine if the delay contributed to associated in-hospital complications such as delirium, or other medical complications.

Methods: This was an IRB-approved retrospective review of all hip fracture patients admitted over a 7-year time period (July 2004 thru December 2011). Inclusion criteria included 60 years or older, hip fracture as a result of a fall (minor trauma only), and the patients underwent surgical repair of the fracture at our institution. Data collection included patient demographics, the primary admitting service, medical comorbidities, American Society of Anesthesiologists (ASA) status, all admission laboratory values, and preoperative cardiac clearance and subsequent cardiac testing if obtained. Additionally, date of admission, time to surgery, and discharge date were recorded with respect to the actual day of the week. Charlson Comorbidity Index (CCI) was calculated and statistical analysis performed to determine significant variables associated with a delay in time to surgery

Results: 638 patients qualified and 321 met the inclusion criteria for complete review. 115 patients (35.83%) were male and 206 (64.17%) were female. Average age was 79.3 years (range, 60-98). 173 patients (53.9%) had surgery within 48 hours of admission and 148 (46.1%) had surgery more than 48 hours after admission (delayed time-to-surgery). Bivariate analysis demonstrated significance with: late week or weekend admission, admitting service other than the dedicated orthopaedic/geriatric service, an increased CCI, an increased ASA status, a creatinine level >1.2 mg/dL, and the presence of *any* preoperative cardiac tests were all significant in predicting a delayed time to surgery (>48 hours). Multivariate analysis adjusted for confounders determined that: admission near or on the weekend ($P = 0.012$, odds ratio [OR] = 2.013, 95% confidence interval [CI] 1.168-3.468), having an ASA status of 4 ($P = 0.002$, OR = 5.094, 95% CI 1.813-14.315), and the presence of *any* preoperative cardiac tests ($P < 0.001$, OR = 3.040, 95% CI 1.701-5.432) significantly predicted a delay to surgery. Changing hospital service before surgery and preoperative hemoglobin <10 g/dL demonstrated near significance for predicting delay. A delay of greater than 48 hours was a significant predictor for postoperative delirium ($P = 0.049$, OR = 1.856, 95% CI 1.003-3.437), which also significantly increased hospital stay. In-house mortality overall was not significant (2.4%).

Conclusion: Our results emphasize the importance of carefully weighing the effects of routine preoperative cardiac testing on time to surgery against any minimal perceived benefits so that postoperative complications, including postoperative delirium, may be avoided. Expediting preoperative cardiac testing may prove beneficial. Efficient clearance

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by a dedicated combined orthopaedic/geriatric service helps limit delays. Strategies to increase weekend operating room volume may help decrease delays and sequelae that occur as a result of late week/weekend admission.

Variable	OR (95% CI)	P Value
Weekend admission	2.013 (1.168-3.468)	0.012
Any preoperative cardiac tests	3.040 (1.701-5.432)	<0.001
ASA status 4 compared to ASA status 2	5.094 (1.813-14.315)	0.002