

**Hip Fracture Treatment at Orthopaedic Teaching Hospitals: Better Care at a Lower Cost**

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**Background/Purpose:** Recently, attention has been directed towards the seemingly high cost of academic medical centers compared to community hospitals for certain procedures. Few studies have examined the effect of teaching hospital status on outcomes for patients with operative hip fractures. None have excluded hospitals without orthopaedic residents from the teaching hospital designation. The purpose of this study is to examine the effect of orthopaedic teaching hospital (OTH) status, in particular, on hospital quality measures and mortality while controlling for potential confounding factors.

**Methods:** All isolated hip fractures admitted to a New York State hospital from 2000 to 2011 were queried from an electronic administrative database (SPARCS). Patients less than 55 years of age, those transferred from outside hospitals, and nonoperative cases were excluded. Charlson comorbidity index (CCI) was calculated to assess comorbidity burden. All orthopaedic residency programs in New York State were contacted to determine the specific hospitals that hosted orthopaedic surgery residents during the study period. These were designated as orthopaedic teaching hospitals. Multivariate, backwards-stepwise linear and logistic regression analyses were performed to determine how orthopaedic teaching hospital designation impacts in-hospital mortality, length of stay (LOS), and total hospital charges. Age, gender, race, CCI, insurance status, fracture type, trauma level, and hospital bed size were controlled for in the multivariate analysis.  $P < 0.05$  was considered significant. Means are reported with  $\pm 1$  standard deviation.

**Results:** Of the 161,080 isolated hip fractures that met inclusion criteria, 57,208 were treated at OTH and 103,872 were treated at nonteaching hospitals (NTH). Univariate analysis shows that mean total hospital charges were higher at OTH ( $\$40,443 \pm \$45,753$ ) than NTH ( $\$31,430 \pm \$29,512$ ) ( $P < 0.0001$ ), LOS was shorter at OTH ( $7.99 \pm 9.6$  days) compared to NTH ( $8.09 \pm 7.7$  days) ( $P < 0.017$ ) and mortality was lower in OTH (3.0%) compared to NTH (3.7%). In the multivariate total charges analysis, in addition to demographic differences, we identified total hospital beds as a significant confounding variable. For every 100 hospital beds, total charges increased 9.8% (odds ratio [OR] = 1.098,  $P < 0.001$ ). Without controlling for hospital beds, OTH designation increases costs 19.9% (OR = 1.199,  $P < 0.000001$ ). However, when controlling for the number of hospital beds, OTH status decreases costs by 4.5% (OR = 0.957,  $P < 0.001$ ). Additionally, multivariate analysis found that OTH status decreased LOS by 9.1% and mortality by 24%, confirming the univariate trends.

**Conclusion:** While OTH may appear to have higher hospital charges for operative hip fractures, this is because they tend to be larger hospitals, which is an independent risk factor for increased charges. When controlling for hospital bed number, OTH status is associated with lower hospital charges, LOS, and lower in-hospital mortality. With the Affordable Care Act incentivizing hospital consolidation, these data suggest that increasing investment in graduate medical education programs at larger hospitals may be one strategy to achieve higher quality care at a lower cost.