The Effect of Timing During the Academic Year and Resident PGY-Level on Complication Rates after Lower Extremity Orthopaedic Trauma Surgery

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Purpose: The “July effect” is the hypothetical increase in morbidity and mortality associated with the education of newly entering resident physicians in their training program. The association between resident involvement and surgical complication rates following orthopaedic trauma surgery has not yet been investigated. The purpose of this study was to investigate any potential “July effect” in lower extremity orthopaedic trauma surgery by evaluating post-operative complications, as well as compare complication rates between junior and senior residents throughout the academic year.

Methods: Patients who underwent operative fixation for hip fractures (CPT 27235, 27244, 27245 or 27236), or operative fixation of femoral or tibial shaft fractures (CPT 27506, 27507, 27758, or 27759) from 2005-2012 were identified in the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database. Complication rates were assessed for all residents (n= 1851), and then separately for junior residents (PGY1, 2 or 3) (n=587) and senior residents (PGY4,5, or 6)(n=1264). These complication rates were then separated by academic quarter in order to evaluate for a “July effect”, and trended to investigate if they change throughout the academic year. Outcome measures included the composite variables of serious adverse events, any adverse events, and surgical complications.

Results: The serious adverse event rate post-operatively was 10.9% during the first academic quarter and 11.4% during the remainder of the year (P=0.8025). The any adverse event rate was 18.6% during the first academic quarter compared to 17.8% for the remainder of the year (P=0.7113). During the first academic quarter the rate of any adverse event was higher among senior level residents compared to junior level residents, 20.6% and 11.8% respectively (P=0.0375).

Conclusion: When evaluating composite complication rates among junior and senior residents throughout the academic year has found no “July effect” in resident-level lower extremity orthopaedic trauma surgery. There was a higher complication rate for senior residents compared to junior residents during the first two academic quarters. Our findings highlight the overall safety of orthopaedic residency training throughout the academic year, though senior residents may benefit from more oversight earlier in the year.