

## **Higher Volume Surgeons Have Lower Cost, Readmissions and Mortality After THA**

**William Murphy, MS**, Tony Cheng, MBA, Ben Lin, Dave Terry, MBA, Stephen B. Murphy, MD

**Introduction:** The advent of value-based care has increased the focus on surgeon- and hospital-specific outcomes. However, methods to identify high quality, low cost surgeons are not well developed. The current study seeks to determine whether there is a relationship between surgeon Total Hip Arthroplasty (THA) volume and the outcomes of mortality, readmission, and Medicare expenditure for that surgeon.

**Methods:** We performed a retrospective analysis of Centers for Medicare and Medicaid Services (CMS) Limited Data Set (LDS) on all primary elective THAs performed in the United States (except Maryland) between January 2013 and June 2016 on Medicare patients. This represented 409,844 THAs totaling more than USD \$7.7 billion in direct CMS expenditures. Surgeons were divided into five groups based on annualized volume of CMS elective THAs over the study period. Using regression, we calculated and compared CMS Part A payments over 90-day periods, readmissions, and mortality among the groups. Ninety-day payments and incidences of readmission and mortality were calculated and compared among the groups. For each episode, demographic information, geographic location, and Elixhauser comorbidities were calculated to control for major confounding factors.

**Results:** When compared to the highest volume group, each lower-volume group had increased costs, increased readmission rates, and increased mortality rates in a stepwise fashion. The lowest volume group resulted in 27.20% more CMS payments per case ( $p < 0.001$ ; 95% confidence interval (CI), 26.62%–27.78%), had an increased mortality odds ratio (OR) of 4.69 ( $p < 0.001$ ; 95% CI, 3.99–5.50), and had an increased readmission OR of 1.77 ( $p < 0.001$ ; 95% CI, 1.69–1.85) when compared to the highest volume group.

**Conclusions:** There is a strong association between a surgeon's Medicare volume and lower CMS payments, mortality, and readmissions. Further, the majority of Medicare THA in the US are performed by surgeons who perform more than 10 operations annually.