

Hospital Total Joint Arthroplasty Case-Mix Burden and Patient Flows in the Era of Payment Reform: Impact on Resource Utilization Among New York State Hospitals

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Introduction: Alternative payment models have been increasingly adopted in orthopedic surgery; mainly bundled payments in total joint arthroplasty (TJA). Concerns persist regarding unintended consequences, such as the selection of healthier TJA candidates. We aimed to study potential selection in terms of: 1) trends in patient comorbidity burden; and 2) the association with costs.

Methods: This retrospective cohort study used 2011 and 2016 New York SPARCS data, including all hip and knee arthroplasties (n=36,365). The main effect of interest was patient comorbidity burden estimated by the Charlson-Deyo Index. The main outcomes were cost and non-home discharge. Hospitals were categorized into those with either an increased, stable (with 5% buffer), or decreased percentage of patients with comorbidities (Charlson-Deyo>0) between 2011-2016. Mixed-effects models measured the association between Charlson-Deyo Index and outcomes by hospital comorbidity categorization. Odds ratios and 95% confidence intervals are reported.

Results: Overall, 46 (n=8,810), 39 (n=16,300) and 67 (n=11,255) hospitals were categorized into the increased, stable and decreased comorbidity burden categories, respectively. Hospitals with decreased patient comorbidity were generally those with a lower annual TJA volume (median: 481) compared to those with increased (median: 558) or stable patient comorbidity (median: 726, p<0.0001). Adjusting for relevant covariates, we found that increased patient comorbidity was associated with increased costs (maximum 22% CI 19%-25%, p<0.0001). However, this effect was moderated in hospitals with increased comorbidity burden. Similarly, increased patient comorbidity was associated with increased odds (maximum OR 3.06 CI 2.59-3.61, p<0.0001) of institutional post-acute care discharge. This effect was weakest in hospitals with increased patient comorbidity.

Conclusions: The majority of hospitals studied saw a decrease in TJA patient comorbidity burden, which may be suggestive of patient selection. Our findings also suggest that a redistribution of comorbid patients to select hospitals could be beneficial, as these hospitals may be better equipped to care for them.