

## Variations in Hospital Billing for Total Joint Arthroplasty

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**Introduction:** Regional variations in medical practice have been well described, with striking regional differences in Medicare spending also reported. It is not clear, however, if there are variations in hospital charges between regions for patients undergoing total joint arthroplasty.

**Methods:** Data from Centers for Medicare and Medicaid Services (CMS) on Medicare Severity-Diagnosis Related Groups (MS-DRGs) 469 (Major Joint Replacement or Reattachment of Lower Extremity with Major Complicating or Comorbid Condition) and 470 (Major Joint Replacement or Reattachment of Lower Extremity without Major Complicating or Comorbid Condition) for the fiscal year 2011 were analyzed. Institutional average hospital charges were investigated for variation by region (Northeast, Midwest, South and West) and correlation to average CMS reimbursement.

**Results:** Data from 932 hospitals was available for MS-DRG 469 and 2,750 hospitals for MS-DRG 470. Drastic variations in billing between institutions were apparent with a mean average hospital charge nationwide of  $\$59,566 \pm 32,307$  (range,  $\$5,304$ - $321,918$ ). Mean average CMS reimbursement nationwide was  $\$16,583 \pm 5,270$  (range,  $\$9,103$ - $100,018$ ). Statistically significant differences for hospital billing between regions were also found ( $p < 0.001$ ). In an attempt to explain these large variations, correlation between hospital charges and CMS reimbursement was calculated, as CMS reimbursement is corrected for each individual hospital by formula for wage index, cost of living, proportion of low-income care, teaching institution and outlier cases. Little to no correlation between hospital charges and reimbursement was found in some regions and only moderate correlation in others and nationwide ( $p = 0.0001$ ).

**Conclusions:** Extreme variations in hospital charges among individual institutions were found, as were variations in charges between regions. More importantly, these drastic disparities in billing between institutions for similar surgical procedures do not correlate with variations in wage index, cost of living, low-income care, teaching institution and outlier cases.