Hospital fee had the largest contribution (75%) to the total cost of index surgery, followed by readmissions (21%). Surgeon's fee and health care resource utilization had much smaller contributions to total cost. True cost savings can occur through engagement and partnering between hospital and surgeon to decrease hospital fees. Reducing readmission episodes and understanding and reducing modifiable drivers of hospital fees have the potential to decrease total direct cost for elective spine surgery [1].

There exists significant variation in total health care costs for patients who undergo spinal surgery, even within a given DRG. Better characterization of impacts of a bundled payment system in spine surgery is important for understanding the costs of index procedure hospital, physician services, and postoperative care on potential future health care policy decision making [2].

The aim of this study was to analyze how a Current Procedural Terminology (CPT)-based categorization method can predict cost variation in surgical spine procedures.

Summary of background data: Neck and back disorders affect a majority of the adult population and account for tens of billions of dollars in health care spending each year. In the era of bundled payments and value-based reimbursement, it is imperative for surgeons to identify sources of cost variability across surgical spine procedures. Historically, this has been accomplished using Medicare Severity Diagnosis Related Group (MS-DRG) codes, but they utilize an overly simplistic categorization of surgical procedures. The specificity and familiarity of the CPT coding structure makes it a better option for categorizing differences in surgical decision making and technique.

Methods: Hospital billing data for patients undergoing a surgical spine procedure requiring an overnight, in-patient stay was retrospectively collected over 4 fiscal years (2012-2016) from a single health care system. Linear regression analysis was performed to assess the correlation between cost variation and: spine-specific MS-DRG codes; a novel CPT-based categorization method; and the combination of MS-DRG codes and CPT-based categorization.

Results: There were 5020 surgical procedures were analyzed with respect to 16 different MS-DRG codes and 30 distinct CPT-based surgical categories (CSCs). Linear regression results were: MS-DRG $R2 = 0.6545$ ($P < 0.001$); CSC $R2 = 0.5709$ ($P < 0.001$); and $R2 = 0.744$ for the combined MS-DRG and CSC methods ($P < 0.05$). Median difference between the actual and predicted cost for the combined model was -$261.00, compared with -$727.50 for the CSC model and -$478.70 for the MS-DRG model.

Conclusion: Addition of the CPT-based categorization method to MS-DRG coding provides an enhanced method to evaluate the association between predicted and actual cost when using linear regression analysis to assess cost variation in spine surgery.Level of Evidence: 3 [3].

1)
Parker SL, Chotai S, Sivaganesan A, Devin CJ, McGirt MJ. 146 Where Does Potential for True Cost Savings Exist Following Elective Surgery for Degenerative Spine Disease? Neurosurgery. 2015 Aug;62 Suppl 1:213. doi: 10.1227/01.neu.0000467108.45053.ce. PubMed PMID: 26181992.
2)
Ugiliweneza B, Kong M, Nosova K, Huang KT, Babu R, Lad SP, Boakye M. Spinal surgery: variations in health care costs and implications for episode-based bundled payments. Spine (Phila Pa 1976). 2014 Jul 1;39(15):1235-42. doi: 10.1097/BRS.0000000000000378. PubMed PMID: 24831503.
3)
Baum GR, Stricsek G, Kumarasamy MA, Thirunavu V, Esper GJ, Boden SD, Refai D. Current Procedural

Terminology-based Procedure Categorization Enhances Cost Prediction of Medicare Severity Diagnosis Related Group in Spine Surgery. Spine (Phila Pa 1976). 2021 Mar 15;46(6):391-400. doi: 10.1097/BRS.0000000000003801. PMID: 33620184.