Drivers of 90-day Cost After Anterior Cervical Discectomy and Fusion for Degenerative Disease

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Introduction

Under the Affordable Care Act, the bundling of payments for elective spine surgery is imminent. Variability in costs associated with the 90-day global period will affect neurosurgeons' ability to stay solvent. We therefore set out to determine the drivers of variability in 90-day cost for elective anterior cervical discectomy and fusion (ACDF).

Methods

A total of 445 patients undergoing elective ACDF were included in the study. Hospital discharge and billing records were collected in a prospective web-based registry. Total cost during the 90-day global period was derived from the diagnosis-related group (DRG) code (hospital fee), CPT code (surgeon fee), visits to providers (such chiropractors, PT, and OT), ER visits, readmissions, imaging, and medications. All cost data were adjusted based on Medicare national allowable payment amounts. Univariate (Figures 1 and 2) and multivariate linear regression modeling was performed for total 90-day cost which incorporated an array of pre-operative, operative and post-operative variables.

Results

The mean 90-day direct cost was \$17685 ± \$5731 (median \$16,394; range \$9,494 to \$62,590). In a multivariate linear regression model, the duration of surgery, number of levels, length of stay, history of anticoagulant use, post-discharge resource utilization (imaging), complications, and readmissions were significant contributors to cost. The regression equation is as follows: total cost = \$6309 + \$1494 (number of levels) + \$32 (length of surgery in min) + \$5796 (preoperative anticoagulation) + \$2263 (length of stay) + \$4890 (complications) + \$9344 (readmission) + \$758 (each x-ray post-discharge). The model performance as measured by R-squared was 0.601.

Conclusions

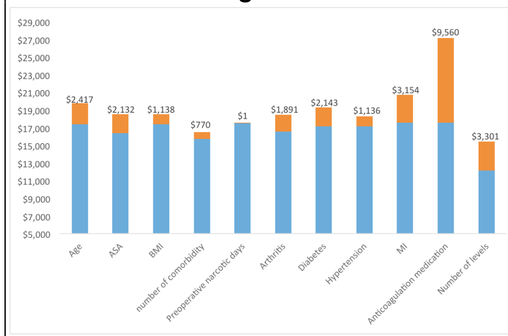
We present a model which highlights drivers of 90-day cost following elective ACDF. Our model explains 60% of the variation in cost. Risk adjustment, based on factors included in our model, must be a key component of bundled payment initiatives if they are to be sustainable and effective in the long-term.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the relevance of variation in 90-day cost to bundled payments for ACDF; 2) Identify drivers of variation in ACDF-related costs; and 3) Explain how exactly those drivers directly influence 90-day costs.

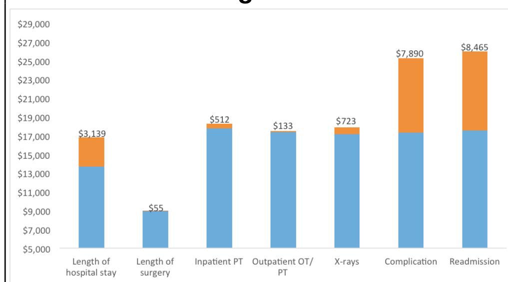
References

Figure 1



A visual representation of pre-operative drivers of 90-day cost associated with elective ACDF.

Figure 2



A visual representation of significant operative and post-operative drivers of 90-day cost associated with elective ACDF.