

ACS COT Residents Trauma Papers Competition Title Page

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Title of the Abstract: Length of Stay and Trauma Center Finances: A Disparity of Payer Source

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LENGTH OF STAY AND TRAUMA CENTER FINANCES: A DISPARITY OF PAYER SOURCE

Background: Inpatient trauma care in the United States is characterized by an economically unfavorable combination of high hospital costs and a relatively underinsured patient population. In an effort to reduce costs, hospitals often focus efforts on reducing length of stay. In fact, it is common for hospitals to benchmark length of stay for individual patients, irrespective of payer source, against the geometric length of stay (GMLOS) as predicted by the assigned diagnosis-related group (DRG) used by the Centers for Medicare and Medicaid Services. However, the relationship between payer source, length of stay, and profit or loss remains unclear. The objective of this study was to evaluate the impact of exceeding GMLOS on hospital profit/loss with respect to payer source.

Methods: Hospital finance reports for trauma patients admitted to a level 1 trauma center between July 1, 2016 and June 30, 2019 were merged with our trauma registry. Patients without a payer source were excluded from analysis. Contribution margin for each patient (revenue less variable cost of care) was used as a measure of profit. A case complexity score was created by summing variables reflecting the presence or absence of injury and treatment aspects of each case. One point was assigned for each consulting specialty area, each complication, for penetrating injuries, and for surgical cases. Categorical injury severity scores were assigned as follows: scores less than 8 were assigned 1 point, scores between 8-15 2 points, and ISS scores of 16 or greater were assigned 3 points.

Contribution margin was regressed on hospital length of stay, consultation by clinical specialty, DRG type (surgical vs medical), DRG version (33 – 36), injury severity score (ISS <9, 9-15, 16+), patient complications, positive illicit drug or alcohol screen, discharge disposition, and exceeding GMLOS to determine significant predictors of profitability. Frequency of exceeding GMLOS was compared among patients according to payer source.

Results: Our cohort included 2,449 cases. The distribution of payers was Medicaid (54.6%), Medicare (24.0%), Commercial (21.4%). 35% (n=867) of the cases we studied exceeded the GMLOS (Commercial 36.6%, Medicaid 31.2%, Medicare 44.2%). The proportion of cases with a positive contribution margin was highest among commercial payers followed by Medicare and then Medicaid (Figure 1) and the median contribution margin was positive for commercial payers (\$16,913) and negative for Medicaid (-\$8,979) and Medicare (-\$2,145) cases. Adjusted multivariate modeling demonstrated that exceeding the GMLOS was not associated with achieving a positive contribution margin for commercial payers (P=.203) but was negatively associated with positive contribution margin for Medicaid (P<.001) and Medicare (P<.001) payers and is visualized using the scatterplot in Figure 2A. The opposite trend emerged when case severity score was plotted against contribution margin (Figure 2B) with a positive and moderate association for commercial payers (r=.48) and a weak association for both Medicaid (r=.13) and Medicare (r=.27) suggesting hospitals are more profitable given complex cases for commercial payers but less so for Medicaid and Medicare payers.

Conclusion: Although benchmarking actual length of stay against predicted GMLOS has become a standard hospital metric regardless of payer source, its importance to hospital reimbursement is markedly different for Medicaid and Medicare patients as compared with the commercially insured. Excessive length of stay occurs more frequently among Medicaid and Medicare patients and contributes to financial losses, while the contribution

margins from the commercially insured are relatively insulated from excessive length of stay. Discharge planning that prioritizes placement of Medicaid and Medicare patients over the commercially insured may provide an opportunity to limit financial losses at level 1 trauma centers.

Figure 1. Summary of contribution margin and payer mix.

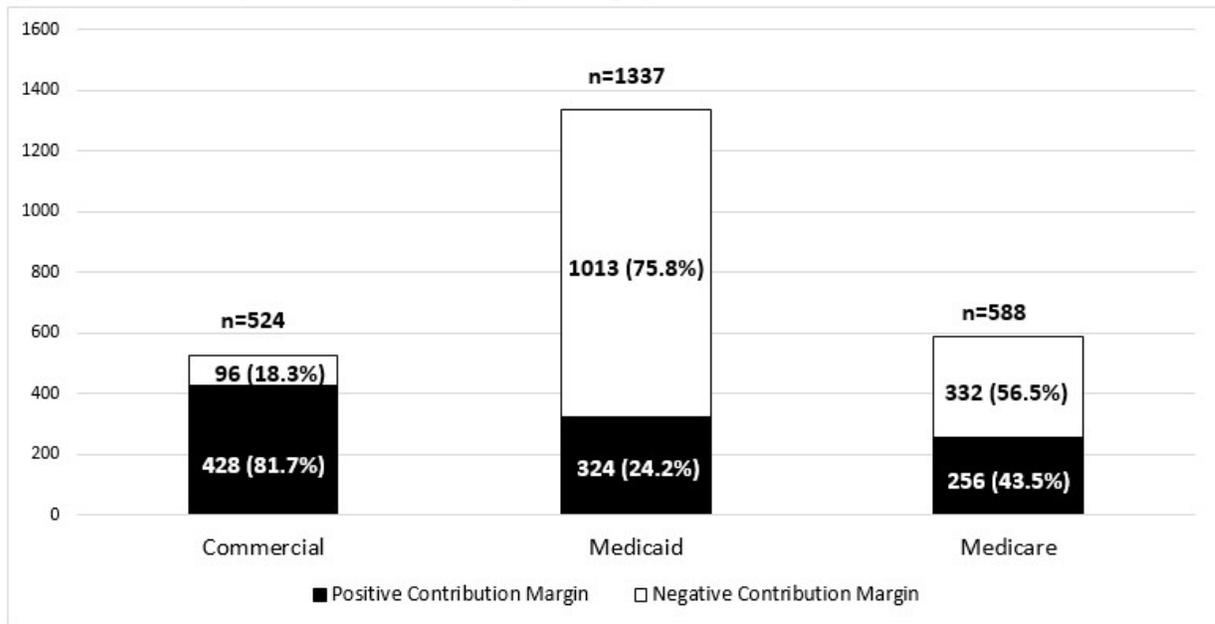


Figure 2. Association between contribution margin within geometric length of stay (left) and case complexity score (right).

