Insurance Status Predicts Patient Safety and Care Quality in the Lumbar Spine Fusion Population

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Introduction

- Lumbar fusion is a common and costly procedure in the United States.
- Reimbursement for surgical procedures is increasingly tied to care quality and patient safety as part of value-based reimbursement programs.
- The incidence of adverse quality events among lumbar fusion patients is unknown using the definition of care quality (named patient safety indicators [PSI]) utilized by the Centers for Medicare and Medicaid Services (CMS).
- Disparities in PSI incidence have been observed across insurance groups in other surgical spine populations.
- The association between insurance status and the incidence of adverse care quality as measured by PSI unknown in lumbar fusion patients

Methods

- Nationwide inpatient sample (NIS) data were queried for all cases of inpatient lumbar fusion from 1998-2011.
- Patients were excluded if "other" or "missing" was listed for primary insurance status and if age was less than eighteen years.
- Incidence of adverse patient safety events (PSI) was determined using publicly available lists of ICD-9-CM diagnosis codes.
- Logistic regression models were used to determine the association between primary payer status (Medicaid/self-pay relative to private insurance) and the incidence of PSI.

Results

- From 1998-2011, 564,930 lumbar fusion procedures were recorded in the NIS.
- The national incidence of PSI was calculated to be 2,445 per 100,000 patient years of observation, or approximately 2.5%
- After adjusting for patient demographics and hospital characteristics, Medicaid/self-pay patients had significantly greater odds of experiencing one or more PSI during the inpatient episode relative to privately insured patients (OR 1.16 95% CI 1.07 – 1.27).

Conclusions

Among patients undergoing inpatient lumbar fusion, insurance status predicts adverse healthcare quality events used to determine hospital reimbursement by CMS. The source of this disparity must be studied to improve the quality of care

Table 2: Effect of Insurance Status on Odds of PSI

	Odds of PSI (Insurance Status Only)	95% CI	Odds of PSI (Insurance Status + Patient Characteristics)	95% CI	Odds of PSI (Insurance Status + Patient and Hospital Characteristics)	95% CI
Medicaid/self-pay	1.43*	1.31 - 1.55	1.20*	1.10 - 1.30	1.16*	1.07 - 1.27
Elective Admission			0.76*	0.69 - 0.84	0.77*	0.69 - 0.84
Age			1.01*	1.0 - 1.02	1.01*	1.0 - 1.02
Female			0.79*	0.74 - 0.83	0.79*	0.75 - 0.84
Blood loss anemia			1.89*	1.56 - 2.28	1.94*	1.61 - 2.34
CHF			2.63*	2.21 - 3.12	2.62*	2.21 - 3.11
Chronic lung disease			1.33*	1.23 - 1.44	1.33*	1.23 - 1.44
Coagulopathy			3.28*	2.9 - 3.7	3.23*	2.87 - 3.64
Deficiency Anemia			1.20*	1.08 - 1.33	1.22*	1.10 - 1.35
Drug abuse			1.49*	1.23 - 1.80	1.46*	1.22 - 1.75
Hypertension			0.84*	0.79 - 0.90	0.85*	0.80 - 0.90
Lymphoma			2.18*	1.55 - 3.07	2.08*	1.49 - 2.90
Electrolyte imbalance			3.82*	3.52 - 4.15	3.78*	3.48 - 4.10
Metastatic cancer			2.51*	2.09 - 3.03	2.34*	1.96 - 2.80
Neurological disorder			1.54*	1.34 - 1.77	1.54*	1.34 - 1.76
Obesity			1.17*	1.07 - 1.29	1.19*	1.08 - 1.30
Paralysis			1.85*	1.59 - 2.17	1.81*	1.56 - 2.11
Peripheral vascular disease			1.52*	1.24 - 1.89	1.52*	1.25 - 1.86
Large hospital size				1.15 - 1.61	1.36*	1.15 - 1.61
Academic Hospital				1.33 - 1.59	1.45*	1.33 - 1.59
Hospital Location						
Midwest				0.62 - 0.83	0.72*	0.62 - 0.83
South				0.67 - 0.88	0.77*	0.67 - 0.88
West				0.64 - 0.87	0.75*	0.64 - 0.87

Table 2: Effect of Insurance Status on Odds of PSI. All results are odds ratios. Comparison of Medicaid/self-pay to private insurance represents the primary analysis. "*" denotes statistical significance at p<0.001. The significant results of three models are displayed: a univariable analysis with insurance status as the sole explanatory variable, a multivariable analysis with insurance status and patient characteristics as explanatory variables, and a multivariable analysis with insurance status and patient and hospital characteristics as explanatory variables. One or more PSI during the inpatient episode served as the outcome variable for all three models. All calculations were performed using SAS version 9.4.