

Insurance status influences the rates of reportable quality metrics in brain tumor patients: a Nationwide Inpatient Sample Study

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Introduction

In 2010, the Patient Protection and Affordable Care Act was passed to expand health insurance, narrow healthcare disparities, and improve health care quality in the United States. The Agency for Healthcare Research and Quality (AHRQ) patient safety indicators (PSIs) and the Centers for Medicare and Medicaid Services (CMS) hospitalacquired conditions (HACs) are now tracked quality metrics. The effects of insurance on the incidence of PSIs and HACs were analyzed using the Nationwide Inpatient Sample (NIS) for brain tumor patients.

Table 1: Patient Demographics by Insurance Type

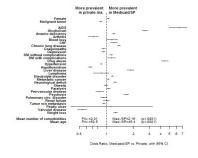
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Administracy with topol					
Emograf	28,80 (12.8%)	124,347,714752	40,000 (17,0%)	HU2HHMO	10.000
Uqual	90H (917G	45,784 (21,8%)	1581(3129)	8/30 (SUN)	4.631
Date	100,000,000,000	4040000	16,879 (22,870)	60708/00000	-0.000
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Yorking	104,ME	130,000	16,000 pt 26,0	16,514,653%	10.000
Hospital Nov. a Ch. Egyd					
bed	553.40 (26.75)	25345	7,966	21,950 (1,950	
Moleum	113,6H (26,7%)	0.941 (25.0%)	25/H (26/E)	4000,0000	-0.000
Logic	575,504 655,500	91,000	78,860 (76.7%)	27,40,74.00	
Respiral Regions					
Northwell	(16.412 (11.7%)	15,147 (51.7%)	0000	4UN(0.N)	
Midwell	104,994 (22,8%)	35,561 (23,1%)	30,807 (30,9%)	32,60 (23,60)	16.000
Seeh	20,00	90(2107.25)	25,985 (42,4%)	33,98 (44%)	
Yes	194,94 (21,75)	40,276 (374%)	90(3)(9.70)	40%(0140)	

†p-values are the results between comparison of Medicaid/Self-pay to Private Insurance. Note significant difference in emergent admissions and comorbidity score amongst Medicaid/self-pay.

Methods

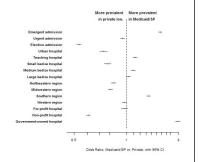
The NIS was gueried for all hospitalizations between 2002 and 2011 involving patients with brain tumors. Because of the confounding age restriction with Medicare, comparisons were made between Medicaid/self-pay and private insurance. To determine which factors contributed to HACs and PSIs, odds ratios were calculated for each risk factor. Logistic regression models were used to assess the effect of payer status on individual PSIs, HACs, and patient outcomes when controlling for covariates.

Figure 1: Patient Factors
Associated with Insurance
Status



Odds Ratio Plot demonstrating patients had more comorbidities in the Medicaid/self-pay populations than private insurance (p<0.0001).

Figure 2: Hospital Factors Associated with Insurance Status



Odds Ratio Plot demonstrating hospital factors and admission type associated with each primary payer status. Note that Medicaid/self-pay populations were more likely to experience emergent admissions and have care at a teaching hospital and government funded facilities.

Table 2: Outcomes by Insurance Type

	Overall n=548,727; (%population)	Medicare n=240,006 (43.7%)	Medicaid / Self- pay n=84,814 (15.5%)	Private insurance n=223,907 (40.8%)	p-value
Total PSIs: n (% of pts)	113,797 (20,7%)	54,670 (22.8%)	17,426 (20.6%)	41,701 (18.6%)	< 0.0001
Total HACs: n (% of pts)	15,810 (2.9%)	9,677 (4.0%)	1,887 (2.2%)	4,256 (1.9%)	< 0.0001
Length of Stay mean ± SD	6.4 ±7.8	6.6 ± 7.2	7.3 ± 10.2	5.9 ± 7.2	< 0.0001
Poor Outcomes n (% of pts)	129,396 (23.5%)	77,947 (38.7%)	15,069 (21,3%)	36,380 (19.4%)	< 0.0001
Mortality n (% of pts)	40,760	18,729 (7,8%)	6,214 (7,3%)	15,817 (7,1%)	< 0.0001

Univariate Analysis of Overall Reults and Outcomes by Primary Payer Status. Estimated national incidence are given as percentage. †p-values with significance defined as p<0.00238.

Results

Medicaid/self-pay patients had a higher PSI and HAC incidence compared with private insurance patients. The greater incidence of PSIs and HACs correlated with increased length of stay, worse discharge outcomes, and increased in-hospital mortality. Many factors, including premorbid hospital conditions, worsened neurologic deficit on admission, and access to care contribute to the greater incidence.

Table 3: Multivariate ANalyses of Outcomes by Payer Status

Total PSIs: (Controlling Patient Factors Only)	Medicaid/self-pay has 8.2% more PSIs than Private (95% Cl=[5.00%, 11.5%], p<0.0001)			
Total PSIs: (Controlling Patient + Hospital Factors)	Medicaid/self-pay and Private not statistically different (95% Cl=[-0.02%, 6.53%], p=0.0618)			
Total HACs: (Controlling Patient Factors Only)	Medicaid/self-pay has 12.3% more HACs than Private (95% Cl=[6.18%, 23.8%], p=0.0005)			
Total BACs: (Controlling Patient + Hospital Factors)	Medicaid/self-pay and Private not statistically different (95% Cir-[-2.83, 16.0] pr0.185)			
Length of Stay (Controlling Patient Factors Only)	Mean 0.8 days longer for Medicaid/self-pay (95% CI+(0.651, 0.907), p<0.0001).			
Length of Stay (Controlling Patient + Hospital Factors)	Mean 0.7 days longer for Medicaid/self-pay (95% Ci+(0.500, 0.849), p=0.0001)			
Poor Outcomes (Controlling Patient Factors Only)	Medicaid/Self-pay 1.3 times the odds of poor outcome (95% Cl+(1,24, 1,34), p=0,0001)			
Peer Outcomes (Controlling Patient + Hospital Factors)	Medicaid/Self-pay 1.2 times the odds of poor outcome (95% Cl=[1.15, 1.25], p=0.0001).			
Mortality (Controlling Patient Factors Only)	Medicaid/Self-pay 1.04 times the odds of death (95% Cl+[1.01, 1.08], p+0.012)			
Mortality (Controlling Patient + Hospital Factors)	Medicaid and private are not significantly different (95% CL=[7, 7], p=00.463)			

Patient factors include Elixhauser comorbidities, tumor grade, age and gender found in Figure 1.

Hospital factors include hospital type and admission type found in Figure 2. †p-values represent the controlled comparison of Medicaid/self-pay with private insurance. Significance defined as p<0.00238.

Conclusions

Variability exists in the incidence of PSIs and HACs in brain tumor patients based on insurance status. The cause of these differences should be studied prospectively to begin the process of improving quality metrics in vulnerable patient populations.

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