

Hospital Admission for Schizophrenia and Discharge Against Medical Advice in the United States

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Objective: Hospital discharge against medical advice may leave a patient at risk for adverse health outcomes and/or readmission, yet little is known regarding its occurrence, especially among patients with mental illness. The objective of this study was to discern the prevalence of, and predictive factors for, being discharged against medical advice among hospitalized patients with a primary diagnosis of schizophrenia.

Method: The 2004 US Healthcare Cost and Utilization Project Nationwide Inpatient Sample was used to discern demographic predictors, length of stay, and costs for discharge against medical advice relative to discharge with medical approval. Inpatient discharges from US community hospitals for patients of all ages with *The International Classification of Diseases, 9th Revision, Clinical Modification* diagnostic codes 295.0–295.9 were included. Conditional logistic regression was used to discern factors predictive of discharge against medical advice, and least squares mean analysis was used to examine differences in length of stay and mean cost per day relative to discharge with medical approval. Least squares means were adjusted for age (continuous), sex, race, region, payer, hospital setting, and bed size.

Results: Within the study population, 1.6% of patients admitted for schizophrenia were discharged against medical advice ($n = 3,382/210,722$). Patients discharged against medical advice were significantly more likely to be younger ($OR = 0.985$, 95% CI, 0.982–0.987) and male ($OR = 1.421$, 95% CI, 1.321–1.529). Race was not a significant factor. Mean \pm SE length of stay for discharge against medical advice was 5.0 ± 0.24 days, as compared to 8.7 ± 0.06 days for patients discharged with medical approval ($P < .0001$). Mean cost per day was significantly higher for discharge against medical advice ($\$1,886.02 \pm 49.67$ vs $\$1,565.79 \pm 13.42$, $P < .0001$).

Conclusions: Although the percentage of patients discharged against medical advice was small, the numeric magnitude on a nationwide basis was substantial. The adjusted mean length of stay for discharge against medical advice was significantly reduced, while cost per day was significantly higher. Discharge against medical advice represents a challenge to the provision of care for patients with schizophrenia and may contribute to increased use of primary and specialty outpatient services, rehospitalization rates, morbidity, and mortality.

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In the United States, the average hospital length of stay has declined significantly over the past 2 decades.^{1,2} Discharge from hospital against medical advice, or self-discharge, from US acute care and teaching hospitals has been reported to range from 0.8%–2.2%,^{3–7} with a commonly cited estimate of approximately 1%.^{8–11} Discharge against medical advice is reported to be associated with a reduction in the continuity of care and an increase in use of primary and specialty outpatient services, morbidity, risk for hospital readmission, and mortality^{2,3,6,9,11,12}; yet, little is known regarding those factors predictive of discharge against medical advice.

Schizophrenia is a psychotic disorder that can impair all aspects of a patient's life and carries a high risk of suicide and other life-threatening conditions.^{13–15} Approximately 10% of patients with schizophrenia will die by suicide,¹⁶ and a discharge against medical advice is positively correlated with detrimental health outcomes.^{17,18} The objectives of this study were (1) to discern the prevalence of, and predictive factors for, discharge against medical advice among US patients hospitalized in acute care hospitals with a primary diagnosis of schizophrenia and (2) to contrast hospital length of stay and cost per hospital day for patients discharged against medical advice with that of patients discharged with medical approval in total and by primary payer.

METHOD

Data Source

The 2004 Healthcare Cost and Utilization Project (HCUP) Nationwide Inpatient Sample (NIS) was the database used for this analysis.¹⁹ The NIS is the largest all-payer inpatient care database that is publicly available in the United States and contains charge information on all patients regardless of payer, including persons covered by Medicare, Medicaid, private insurance, and the uninsured, as well as clinical and resource use information typically available from discharge abstracts.

CLINICAL POINTS

- ◆ Discharge from hospital against medical advice is positively correlated with detrimental health outcomes.
- ◆ Patients with schizophrenia who are discharged against medical advice are more likely to be young and male.
- ◆ Discharge against medical advice represents a challenge to the provision of care for patients with schizophrenia due to tension between patients' rights and psychiatrists' duties.

This database is maintained by the US Public Health Service's Agency for Health Care Research and Quality.

The NIS is designed to approximate a 20% sample of US community hospitals defined by the American Hospital Association as "all nonfederal short-term, general and other specialty hospitals, excluding hospital units of institutions."¹⁹ Included among community hospitals are specialty hospitals such as obstetrics and gynecology; ear, nose, and throat; orthopedic; and pediatric institutions. Also included are public hospitals and academic medical centers. Excluded are short-term rehabilitation hospitals, long-term hospitals, psychiatric hospitals, and alcoholism/chemical dependency treatment facilities.

The universe of US community hospitals is divided into strata using 5 hospital characteristics: hospital ownership/control, bed size, teaching status, rural/urban location, and US region. The NIS is a stratified probability sample of hospitals in the frame, with sampling probabilities proportional to the number of US community hospitals in each stratum. The sample for the 2004 NIS was drawn from 1,004 hospitals within the 36 participating HCUP partner states resulting in 8,004,571 patient discharges and 38,661,786 weighted discharges. To facilitate the production of national estimates, both hospital and discharge weights are provided.¹⁹

Data contained in each discharge pertinent to this study included patient demographics; expected source of primary payment; diagnostic profiles based on *The International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM)* coding²⁰; and measures of resource use, including hospital length of stay, total charges, and discharge status. Hospital characteristics were obtained from the American Hospital Association Annual Survey of Hospitals and were merged with each discharge.²¹

Study Population

The study population was selected from all 2004 patient discharges. Study entry criteria were as follows: (1) patients of all ages; (2) an *ICD-9-CM* diagnostic code of 295.0–295.9 indicating schizophrenia as the primary diagnosis; (3) Medicare, Medicaid, or private insurance, inclusive of fee for service or managed care, identified

as the primary source of insurance coverage; and (4) hospitalization of between 1 and 30 days. A cut off of 30 days hospital length of stay was selected so that the sample would be more representative of patients with episodic admissions, rather than those permanently or near continuously hospitalized with this condition. Ninety-three percent of discharges for schizophrenia were found to have a hospital length of stay of between 1 and 30 days. Having applied the above entry criteria, the final sample used for this analysis consisted of 43,733 discharges. After applying sampling weights provided by HCUP to make the sample representative of the US population, the final sample represented 210,722 discharges. The unit of analysis is the hospital stay.

Statistical Analysis

Statistical analyses were conducted using SAS, version 9.1.3.²² Descriptive statistics were used to characterize the study sample in total and by discharge status: those discharged against medical advice as compared to those discharged with medical approval.

Odds ratios (ORs) and 95% confidence intervals (CIs) were generated by conditional logistic regression (using the SAS procedure PROC Logistic) to discern the influence of patient's age (continuous), race (white as compared to nonwhite, inclusive of Hispanics), sex, and primary payer type (Medicare, Medicaid, private insurance) on being discharged against medical advice. Models were also run separately by primary payer.

Using the SAS procedures PROC GLM and PROC SURVEYREG, least squares mean analyses were used to examine the dependent variables hospital length of stay and charge per day by discharge status. Least squares means were adjusted for age (continuous), sex, race, region of country (Northeast, Midwest, South, West), primary payer, hospital setting (rural, urban nonteaching, urban teaching), and hospital bed size (small, medium, large). Models were also run separately by primary payer.

The variable mean charge per day was computed as the ratio of total charges to length of stay. In this data set, total charges refer to the hospital bill (ie, charges) and generally do not include the amount billed for physician services or discounts negotiated by specific payers. These charges

Table 1. Characteristics of Discharges Among Patients Hospitalized Between 1 and 30 Days With a Diagnosis of Schizophrenia in Total and by Discharge Status in 2004^{a,b}

Characteristic	Schizophrenia Discharges (n = 210,722)	Discharged Against Medical Advice (n = 3,382)	Discharged With Medical Approval (n = 207,340)	χ^2 Statistic	P Value
Age, y					
< 20	5,013 (2.4)	53 (1.6)	4,960 (2.4)	221.0	<.0001
20–39	78,904 (37.4)	1,480 (43.8)	77,424 (37.3)		
40–59	104,749 (49.7)	1,739 (51.4)	103,010 (49.7)		
60–79	20,847 (9.9)	110 (3.2)	20,737 (10.0)		
80+	1,209 (0.6)	...	1,209 (0.6)		
Male	120,591 (57.2)	2,265 (67.0)	118,326 (57.1)	133.7	<.0001
Race					
White	110,299 (52.3)	1,697 (49.8)	108,602 (52.4)	6.5	.0106
Nonwhite ^c	100,423 (47.7)	1,685 (50.2)	98,738 (47.6)		
Payer					
Medicare	105,767 (50.2)	1,824 (53.9)	103,943 (50.1)	19.4	<.0001
Medicaid	87,915 (41.7)	1,304 (38.6)	86,611 (41.8)		
Private/HMO	17,040 (8.1)	254 (7.5)	16,786 (8.1)		
Region of country					
Northeast	59,759 (28.4)	709 (21.0)	59,050 (28.5)	648.9	<.0001
Midwest	31,198 (14.8)	259 (7.6)	30,939 (14.9)		
South	71,254 (33.8)	1,045 (30.9)	70,209 (33.9)		
West	48,511 (23.0)	1,369 (40.5)	47,142 (22.7)		
Hospital setting					
Rural	12,609 (6.0)	161 (4.8)	12,448 (6.0)	50.0	<.0001
Urban, nonteaching	114,402 (54.3)	2,037 (60.2)	112,365 (54.2)		
Urban, teaching	83,711 (39.7)	1,184 (35.0)	82,527 (39.8)		
Hospital bed size					
Small	17,537 (8.3)	222 (6.5)	17,315 (8.3)	92.2	<.0001
Medium	46,705 (22.2)	973 (28.8)	45,732 (22.1)		
Large	146,480 (69.5)	2,187 (64.7)	144,293 (69.6)		

^aValues are presented as n (%).^bThe *International Classification of Diseases, 9th Revision, Clinical Modification* codes 295.0–295.9.²⁰^cIncludes Hispanics.

do not necessarily represent the amount reimbursed to the hospital and are not synonymous with costs.¹⁹

RESULTS

Characteristics of the 210,722 hospital discharges for schizophrenia are presented in Table 1, in total and by discharge status. Overall, patients were predominantly male (57.2%), white (52.3%), and had a mean \pm SD age of 42.8 ± 13.3 years. Over half (50.2%) of the study population had Medicare as the primary source of insurance coverage, 41.7% had Medicaid, and only 8.1% reported private insurance. Within the study population, 1.6% of patients were discharged against medical advice (n = 3,382/210,722).

Overall, patients discharged against medical advice were significantly more likely to be younger (OR = 0.985; 95% CI, 0.982–0.987) and male (OR = 1.421; 95% CI, 1.321–1.529), as compared to patients released with medical approval. Race was not a significant factor (Table 2). Separate analyses by primary payer (Medicare, Medicaid, and private insurance) revealed similar results, with younger age and male gender being significant predictors of discharge against medical advice. Among Medicare beneficiaries, being nonwhite was also a

significant predictor for being discharged against medical advice (OR = 1.118; 95% CI, 1.018–1.229).

Table 3 presents the adjusted least squares means for hospital length of stay by discharge status. The overall mean \pm SE length of stay for patients discharged against medical advice was 5.0 ± 0.24 days, as compared to 8.7 ± 0.06 days ($P < .0001$) for patients discharged with medical approval. Separate analyses by primary payer revealed similar statistically significant results. The adjusted mean length of stay for patients discharged against medical advice was reduced by 41.1% for Medicare patients, 45.1% for Medicaid patients, and 39.2% for patients with private insurance, as compared to patients discharged with medical approval.

The overall adjusted mean \pm SE charge per hospital day for patients discharged against medical advice was significantly higher ($P < .0001$) (\$1,886.02 \pm \$49.67), as compared to patients discharged with medical approval (\$1,565.79 \pm \$13.42) (Table 4). Similar increases ($P < .0001$) were discerned within each payer category.

DISCUSSION

Previous studies of psychiatric inpatients hospitalized within psychiatric units have discerned a mean discharge

Table 2. Logistic Regression–Derived Odds Ratios (ORs) and 95% CIs for Factors Predictive of Being Discharged Against Medical Advice Among Patients Hospitalized Between 1 and 30 Days With a Diagnosis of Schizophrenia Overall and by Primary Payer in 2004 (n = 210,722)^a

Variables in Model	Overall OR (95% CI) ^{b,c}	Medicare OR (95% CI) ^{d,e}	Medicaid OR (95% CI) ^{d,f}	Private/HMO OR (95% CI) ^{d,g}
Age (continuous)	0.985 (0.982–0.987) ⁱ	0.977 (0.974–0.981) ⁱ	0.987 (0.982–0.991) ⁱ	0.983 (0.973–0.992) ⁱ
Sex				
Female = 0	1.421 (1.321–1.529) ⁱ	1.349 (1.218–1.494) ⁱ	1.279 (1.140–1.434) ⁱ	2.372 (1.782–3.159)
Male = 1				
Race				
White = 0	1.042 (0.973–1.115)	1.118 (1.018–1.229) ⁱ	1.046 (0.935–1.171)	1.097 (0.853–1.409)
Nonwhite = 1 ^h				

^aThe International Classification of Diseases, 9th Revision, Clinical Modification codes 295.0–295.9.²⁰^bAdjusted for age, sex, race, and payer.^cModel $\chi^2 = 317.67$ with $df = 5$, $P < .0001$.^dAdjusted for age, sex, and race.^eModel $\chi^2 = 197.24$ with $df = 3$, $P < .0001$.^fModel $\chi^2 = 60.32$ with $df = 3$, $P < .0001$.^gModel $\chi^2 = 61.39$ with $df = 3$, $P < .0001$.^hIncludes Hispanics.ⁱ $P \leq .05$.**Table 3. Least Squares Mean Analyses: Hospital Length of Stay by Discharge Status Among Patients Hospitalized Between 1 and 30 Days With a Diagnosis of Schizophrenia Overall and by Primary Payer in 2004 (n = 210,722)^a**

Discharge Status	Overall Days, Mean \pm SE ^{b,c}	Medicare Days, Mean \pm SE ^{b,d}	Medicaid Days, Mean \pm SE ^{b,d}	Private/HMO Days, Mean \pm SE ^{b,d}
Released against medical advice	5.0 \pm 0.24	5.6 \pm 0.33	4.5 \pm 0.38	4.8 \pm 0.83
Released with medical approval	8.7 \pm 0.06	9.5 \pm 0.08	8.2 \pm 0.10	7.9 \pm 0.21

^aThe International Classification of Diseases, 9th Revision, Clinical Modification codes 295.0–295.9.²⁰^b $P < .0001$.^cAdjusted for age, sex, race, region of country, hospital setting, hospital bed size, and payer.^dAdjusted for age, sex, race, region of country, hospital setting, and hospital bed size.**Table 4. Least Squares Mean Analyses: Hospital Charge Per Day by Discharge Status Among Patients Hospitalized Between 1 and 30 Days With a Diagnosis of Schizophrenia Overall and by Primary Payer in 2004 (n = 209,126)^a**

Discharge Status	Total Charge Per Day, Mean \pm SE ^{b,c}	Medicare Charge Per Day, Mean \pm SE ^{b,d}	Medicaid Charge Per Day, Mean \pm SE ^{b,d}	Private/HMO Charge Per Day, Mean \pm SE ^{d,e}
Released against medical advice	\$1,886.02 \pm \$49.67	\$1,938.01 \pm \$78.59	\$1,787.13 \pm \$60.53	\$2,085.35 \pm \$153.60
Released with medical approval	\$1,565.79 \pm \$13.42	\$1,579.09 \pm \$19.06	\$1,526.09 \pm \$15.67	\$1,707.05 \pm \$35.74

^aThe International Classification of Diseases, 9th Revision, Clinical Modification codes 295.0–295.9.²⁰^b $P < .0001$.^cAdjusted for age, sex, race, region of country, hospital setting, hospital bed size, and payer.^dAdjusted for age, sex, race, region of country, hospital setting, and hospital bed size.^e $P = .0129$.

against medical advice rate of approximately 16% across all diagnoses.^{1,23–26} However, small sample sizes and lack of clarity regarding diagnostic classification have limited the generalizability of these studies. Moreover, most of these studies were undertaken prior to the advent of managed care when inpatient length of stays were longer.¹ Over the past 3 decades, the trend in psychiatric patient care has been to shift inpatient treatment away from its traditional *parens patriae* role to short-term stabilization and acute care.^{12,27}

Our research indicates that, among US patients hospitalized in acute care hospitals with a primary diagnosis of schizophrenia in 2004, 1.6% were discharged against medical advice. This prevalence rate is in the range reported for all patients admitted to US acute

care hospitals who subsequently were discharged against medical advice (0.8%–2.2%).^{3–7} Younger age and male sex were found to be predictive of discharge against medical advice in the aggregate and across payer type. These factors have consistently been reported as predictors of hospital discharge against medical advice across a variety of diagnoses and in a number of hospital settings, including community hospitals,^{28–30} teaching hospitals,⁶ and psychiatric units.^{12,31}

Although numerous studies have documented race,¹ especially black race,^{8–10,28} to be a significant predictor of discharge against medical advice, we did not discern a significant difference between whites and nonwhites, inclusive of Hispanics, when examining the entire study population. However, separate

analyses by primary payer indicate that nonwhites enrolled in Medicare were approximately 12% more likely to be discharged against medical advice.

After adjusting for potentially confounding factors, inclusive of age, sex, race, region of the country, hospital setting, hospital bed size, and payer, we found the mean \pm SE hospital length of stay to have been reduced by 3.7 days for patients discharged against medical advice (5.0 ± 0.24 days) as compared to those discharged with medical approval (8.7 ± 0.06 days). Separate analyses by primary payer revealed a similar magnitude of reduction in hospital length of stay (Medicare, 3.9 days; Medicaid, 3.7; private, 3.1). Interestingly, the adjusted mean \pm SE hospital length of stay for patients with private insurance and released with medical approval (7.9 ± 0.21 days) was significantly shorter than that of patients whose primary payer was Medicare (9.5 ± 0.08 days) or Medicaid (8.2 ± 0.10 days).

This finding is in agreement with previous research examining the influence of payer type on hospital length of stay for patients with schizophrenia and may represent a quality-of-care concern.³² If a reduced hospital length of stay has an adverse influence on the care of patients with schizophrenia, then relapse rates and overall costs may actually increase under private insurance programs. On the other hand, if private insurance programs have delivered on the promise of reducing costs while improving the quality and scope of care, then both patients with schizophrenia and society will benefit greatly.

Results stemming from this inquiry indicate the mean charge per hospital day was significantly higher for patients discharged against medical advice relative to patients discharged with medical approval across all patients (\$1,886.02 vs \$1,565.79) and by primary payer. Findings may reflect greater acuity at the time of hospital admission among patients who were ultimately discharged against medical advice,² or a reduction in charges (intensity of care) may have occurred during the latter course of a hospital stay for patients discharged with medical approval.

We acknowledge that factors not recorded in the NIS, inclusive of a clinical measure of severity of illness (at time of hospital admission and/or discharge), level of social support, and access to outpatient mental health services, limit the conclusions that may be drawn from our analyses. Moreover, the NIS did not include patients admitted to psychiatric hospitals or alcoholism/chemical dependency treatment facilities. That said, the empirical findings presented herein provide a basic understanding as to the magnitude of, demographic predictors for, and inpatient cost profile for hospital discharge against medical advice among patients with schizophrenia.

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