Predicting Readmission to the Psychiatric Hospital in a Managed Care Environment: Implications for Quality Indicators

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Objective: This study examined predictors of hospital readmission to determine whether readmissions can serve as a quality indicator for an inpatient psychiatric service. *Method:* A series of 255 patients consecutively admitted to any of seven psychiatric hospitals in a regional managed care program were followed to determine whether they were readmitted within 6 months of discharge. Case managers assessed patients with the use of a reliable outcome management/decision support system designed for acute psychiatric services. *Results:* Patients with greater impairment in self-care, more severe symptoms, and more persistent illnesses were more likely to be readmitted than other patients. Suicidal patients were less likely to be readmitted. There was no evidence to suggest that poor hospital outcome or premature discharge was associated with readmission either within 30 days or within 6 months. *Conclusions:* Although patients at risk for hospital admission can be identified, it does not appear that the success of the hospital intervention per se influences the likelihood of readmission. Use of readmission rates as quality indicators for hospital care providers is not recommended.

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Development of interest in outcomes and quality indicators has resulted in attempts to identify easy-to-measure indexes that provide program managers, third-party payers, and policy makers with information regarding the functioning of health services (1). While the emphasis on outcomes is seen consensually as a healthy development in the medical care industry, a rush to the use of complex indicators in the absence of an understanding of their meaning might have untoward consequences (2).

One commonly proposed quality indicator for inpatient psychiatric services is readmission (3). Hospital readmission, particularly when it occurs within a relatively short time after a previous discharge, is often seen as a failure of the earlier hospital admission. This presupposes that if appropriate care had been taken in stabilizing the patient's psychiatric status and planning for community treatment, return to the hospital would not have occurred. While the logic of this argument is appealing in its coherence and simplicity, there have been no empirical attempts at understanding whether or not hospital readmission actually represents a failure on the

part of the initial hospitalization. Such documentation is critical, because those who interpret readmission rates must be informed by the meaning of these rates for the hospital care provider and the consuming public. These issues have become particularly important with the dramatic decrease in length of inpatient stays over the last few years and the fears of inadequate patient care that this reduction has generated (4). Feelings abound that health care reform generally and managed health care specifically have lost sight of the patient while focusing on cost containment and reduction.

Although there is a body of research on predictors of readmission (4–9), particularly with regard to individuals served by public-sector mental health services, there are few if any studies that have looked at the relationship of hospital outcome to readmission in a private, managed mental health care program. There are several reasons why such empirical research has not been undertaken. First, it has been difficult to follow individuals after discharge from a psychiatric hospital to determine definitively whether they were readmitted to any psychiatric hospital, since historically consumers have had a great deal of choice regarding hospitals. Second, there has been little research that has empirically assessed the clinical outcome of inpatient psychiatric treatment in general, making a comparison of inpatients' outcomes with hospital readmissions less likely.

In the current climate, understanding the relationship of hospital outcome to readmission is particularly important. With the dramatically shortened lengths of

hospitalization in the present service system, an assessment of the effects of hospitalization must conform to the treatment goals of crisis stabilization rather than longer-term treatment of the psychiatric disorder. The reduction of lengths of stay has resulted in a concern about "quicker but sicker" with regard to psychiatric patients' continuing acute symptoms and need for intensive nursing services at hospital discharge. Thus, it is also important to determine whether premature discharge predicts readmission (4).

This study attempted to determine whether there is evidence to suggest that readmission to a psychiatric hospital is an indicator of the failure of the previous hospital stay. First, by using a large Midwestern managed care program with a stable membership, it was possible to track readmission regardless of the hospital used for the second admission. Second, by using an integrated outcomes management system for acute psychiatric services, it was possible to determine whether ineffective hospital treatment was a determinant, at least in part, of later readmission to a psychiatric inpatient program.

METHOD

Patients consecutively admitted to the seven most highly utilized hospitals within a large regional managed care program were studied. As an adjunct to a large Midwestern teaching hospital (Northwestern Memorial Hospital), this program provides comprehensive mental health services to more than 400,000 covered individuals in the Chicago metropolitan area bounded by Wisconsin on the north, Rockford on the west, Joliet on the south, and Hammond on the east. From one year to the next, about 10% of the membership changes to insurance coverage outside the present managed care program. The study group consisted of 255 persons who were hospitalized for psychiatric problems within the provider network. Each was admitted to one of the aforementioned seven facilities between July 1, 1994, and Feb. 1, 1995. All participants were informed about the nature of the ongoing outcome research within the managed care program, of which this study was one component, and provided written informed consent. The study was reviewed and approved by Northwestern University's institutional review board.

Each patient was assessed by the managed care program's case manager using both the Severity of Psychiatric Illness scale (10–12) and the Acuity of Psychiatric Illness scale (12, 13). The information for this assessment was obtained from an interview with the participating nursing staff at each participating hospital. The Severity of Psychiatric Illness and Acuity of Psychiatric Illness indexes are components of a larger decision support method developed to provide reliable, clinically relevant information to both the care providers and the case managers responsible for determining the necessity of psychiatric hospital admissions. The Severity of Psychiatric Illness scale, a case-mix utilization review tool, is organized according to four dimensions, each embodying several smaller subscales: 1) reasons for admission (including suicide potential, danger to others, and current level of self-care), 2) complications to the psychiatric disorder (including substance abuse/dependence, medical illness, family disruption, vocational impairment, and residential instability), 3) complications to treatment (including resistance to treatment, family involvement, and premorbid level of dysfunction), and 4) severity and persistence of illness (severity of symptoms and premorbid level of dysfunction). Each dimension is rated on a 4-point scale from 0 to 3 with definitions at each level. For the reliability of the Severity of Psychiatric Illness scale ratings among the managed care program case managers, kappa=0.81 for interrater agreement.

The Acuity of Psychiatric Illness scale, an outcome assessment de-

signed for acute psychiatric services, consists of two larger domains encompassing several dimensions: 1) clinical status (including suicidal preoccupation, aggressive outbursts, verbal threats, verbal and physical agitation, reality assessment, judgment, confusion, living situation, and self-report of well-being) and 2) nursing status (including psychiatric status, psychiatric monitoring, medical monitoring, level of self-care, participation in treatment, psychotropic medication, and aftercare plan). The Acuity of Psychiatric Illness assessment has been shown to be a reliable, valid, and efficient means with which to evaluate the outcome of acute psychiatric services and to measure the clinical transitions experienced by patients during service delivery (11, 12). For the reliability of the Acuity of Psychiatric Illness scale ratings among the managed care program case managers, kappa=0.79 for interrater agreement.

Since the Severity of Psychiatric Illness scale was designed to measure more stable, case-mix characteristics, it was completed only upon admission, while the Acuity of Psychiatric Illness scale, an outcome measure that was designed to be sensitive to change in patient status, was administered every 2–3 days at each reauthorization for the duration of the hospital stay. For this study, initial and discharge Acuity of Psychiatric Illness scores were used.

RESULTS

The study group was predominantly female (60.7%). The average age was 30.8 years (range=11–67). Most of the patients were admitted with a primary diagnosis of a major affective disorder (63.5%). Schizophrenia (3.3%), atypical psychosis (4.6%), and adjustment disorders (2.9%) were the next most common disorders. Behavioral disorder diagnoses were used for some younger patients (8.8%); these included conduct disorder (2.1%) and oppositional disorder (1.7%). The only other class of diagnoses used for more than two patients was eating disorders (5.8%).

For this group of patients, the average length of stay was 6.7 days (SD=5.2, range=4–35).

Of the 255 patients included in the study, 45 (17.6%) were readmitted to a hospital during the 6-month follow-along period. Only 18 (7.1%) of the readmissions occurred within 30 days of discharge from the index admission. There were no differences in readmission rates (30 days or 6 months) among hospitals.

There were no differences between readmitted and not-readmitted patients in age or gender. Similarly, there were no diagnostic groups that were more likely to experience readmission.

Clinical Predictors of Readmission

Of the dimensions of the Severity of Psychiatric Illness measure, only impairment in self-care was significantly associated with 30-day readmission (t=2.49, df=253, p<0.02); rapidly readmitted patients had a higher level of self-care impairment. There was also a tendency for patients readmitted within 30 days to have a higher level of medical complications (t=1.84, df=253, p<0.07).

Patients readmitted within 6 months differed from the other patients on a number of dimensions. The readmitted patients had higher levels of severity of symptoms (t=2.42, df=253, p<0.02) and less family involvement (t=2.01, df=253, p<0.05). In addition, they tended

to have greater substance abuse complications (t=1.88, df=253, p<0.06).

Using logistic regression to predict readmission within 1 year, we found that the following dimensions were significant: impairment in self-care (p<0.01), severity of symptoms (p<0.02), suicide potential (p<0.03), and premorbid level of dysfunction (p<0.05). Suicide potential was negatively associated with readmission; all of the other dimensions were positively associated. The model accurately classified 82.9% of the patients.

TABLE 1. Scores on the Acuity of Psychiatric Illness Scale at Index Admission and Discharge of Patients Readmitted and Patients Not Readmitted to a Hospital Within 6 Months

Acuity of Psychiatric Illness Scale	Patients Readmitted (N=45)				Patients Not Readmitted (N=210)			
	Admission		Discharge		Admission		Discharge	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Clinical status score	35.6	28.4	21.1	12.5	27.1	18.9	16.5	10.5
Nursing status score	31.4	12.8	23.8	11.9	30.0	14.4	21.1	12.0
Total score	67.0	32.9	44.9	29.8	57.1	27.9	37.6	25.2

Readmission as a Result of Poor Hospital Outcome

Table 1 shows the Acuity of Psychiatric Illness scale scores at admission and at discharge of the patients who were readmitted and those who were not. While the patients who were readmitted had higher clinical status scores at admission (t=2.54, df=253, p<0.01), there were no differences at discharge in the clinical status, nursing status, or total Acuity of Psychiatric Illness scores. Similarly, there were no differences between the patients readmitted and those not readmitted in terms of change in total acuity scores during the hospital stay.

Readmission as an Effect of Early Discharge

There were no differences in length of stay at the index admission between patients who were later readmitted and those who were not. The average for the entire study group was slightly more than 6 days. However, it is possible that differences in clinical characteristics between readmitted and not-readmitted patients mask any association between length of stay and readmission status. In other words, patients discharged earlier than predicted on the basis of their clinical characteristics might be more likely to be readmitted.

To determine whether patients discharged prematurely (i.e., earlier than predicted by their clinical status) were at greater risk of readmission, a hierarchical multiple regression model was used. In the model, the clinical dimensions of the Severity of Psychiatric Illness scale were used to predict length of stay. Following entry of these variables into the equation, readmission was entered as a dummy variable. If readmission is associated with a shorter length of stay, there should be a significant negative relationship between readmission and the residual length of stay when the clinical characteristics of the patient are controlled for.

The overall regression model was significant (F=4.13, df=10, 241, p<0.0001). The following Severity of Psychiatric Illness dimensions were positively associated with length of stay in the standard regression model: difficulties in self-care (t=2.16, df=251, p<0.03), severity of symptoms (t=2.51, df=251, p<0.02), and residen-

tial instability (t=2.15, df=251, p<0.04). In addition, the following two Severity of Psychiatric Illness dimensions were negatively associated with length of stay: suicide potential (t=–2.17, df=251, p<0.03) and substance abuse complications (t=–2.02, df=251, p<0.05). Contrary to the hypothesis that readmission results from premature hospital discharge, readmission status was not significantly related to length of stay after we controlled for these clinical characteristics.

DISCUSSION

While it is possible to predict which patients are at risk for readmission, it does not appear that poor outcome from the index hospitalization represents one of these risk factors. Rather, patients with more severe and persistent difficulties and with higher levels of impairment in self-care are at greater risk. This finding is consistent with those of other studies predicting readmission (14). Patients hospitalized because they are suicidal appear to be at lower risk for readmission.

There are several interesting implications of the findings of this study. First, at least for the managed care program we studied, readmission to a psychiatric hospital is not a particularly good indicator of the quality of hospital care providers. There is no evidence that readmission results from a poor outcome of an index psychiatric hospital stay. Second, it does not appear that readmission is related to premature discharge. Thus, the shortening of hospital stays under managed care, while it probably increases the number of persons with acute symptoms of mental illness served in the community, does not appear to result in a revolving door model of inpatient care.

Research on public-sector psychiatric hospitalizations has consistently shown that coexisting substance-related disorders are the best predictors of readmission (5, 9). In the present study, substance abuse complications were related to shorter inpatient stays (9) but did not predict readmission. However, unlike some public mental health systems, in the managed care program we studied, there is a standard of care such that the detection of substance-related disorders results in referral to substance abuse treatment programs. The absence of a greater risk of readmission for patients with dual diagnoses in our study group may emphasize the importance of attending to chemical dependency diagnoses

and the false economy in restricting access to these services. More barriers to such cross-referrals may exist in the public mental health service sector (5). These findings suggest that managed care approaches might be useful in the public sector for addressing the discontinuity of care experienced by persons with coexisting psychiatric illness and substance-related disorders.

If readmission is not a quality indicator for hospital care providers, it probably has other meanings within the mental health service system. There are several alternatives. First, readmission to a psychiatric inpatient program may be a reflection of the course of mental illness, since psychiatric disorders vary in their severity, the duration of episodes, and the time between episodes. These patient-specific factors may influence readmission rates. The findings of this study are consistent with this hypothesis.

Second, it is possible that readmission rates reflect general admission policies. It has been reported that higher hospital readmission rates are associated with a higher frequency of inappropriate admissions (10). Thus, rather than indicating a failure of treatment, readmissions might represent a low threshold for hospitalization. In the managed care program in this study, hospitals with the most inappropriate admissions also have had the highest readmission rates. This suggests that readmission might be, at least partially, a function of hospital admission policy per se. Readmission rates might be an indirect indicator of a problem of overadmitting. A more direct quality indicator on this dimension would be an assessment of the medical necessity of all admissions.

Finally, readmission may reflect the quality of community services or support (15, 16). Prevention of readmission is likely the responsibility of the community care provider rather than the psychiatric hospital once the psychiatric hospital has organized an initial aftercare plan in collaboration with the community provider.

Obviously, many questions remain. However, it seems clear that in this study group, the reductions in length of hospital stay have not produced a psychiatric revolving door. Similarly, it does not appear that readmission rates are useful quality indicators for inpatient psychiatric programs. It is noteworthy that the means presented in table 1 demonstrate that psychiatric hospitalization, even for a short period of time, is associated with a significant reduction in acute symptoms of psychiatric illness (clinical status) and reductions in the need for intensive nursing services (nursing status). Thus, more direct measures of outcomes may yield im-

portant findings to identify the role of the psychiatric hospital in the evolving mental health service system. It is not likely that readmission rates can contribute to this task.

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