Twelve-Month Outcome After a First Hospitalization for Affective Psychosis

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**Background:** We studied the 12-month course of illness after a first hospitalization for affective psychosis to identify potential outcome predictors in this rarely studied patient population.

**Methods:** For this study, 109 patients consecutively admitted for their first psychiatric hospitalization for treatment of affective psychosis were recruited. Diagnostic, symptomatic, and functional evaluations were obtained at the index hospitalization and at 2, 6, and 12 months after discharge to assess syndromic, symptomatic, and functional outcome predictors. Factors associated with outcome were identified by means of multivariate analyses.

**Results:** Fifty-six percent of the patients achieved syndromic recovery during the 12-month follow-up. Full treatment compliance was associated with more frequent and rapid syndromic recovery. Full compliance was more common in white patients and in patients without substance abuse. Only 35% of these patients achieved symptomatic recovery during this same 12-month interval, and, similarly, only 35% achieved functional recovery. Symptomatic recovery was delayed in patients with substance abuse and was associated with higher socioeconomic status. Higher socioeconomic status was also associated with functional recovery, as was good premorbid function.

**Conclusions:** Few patients achieved a favorable outcome in the year after a first hospitalization for an affective psychosis. Low socioeconomic status, poor premorbid function, treatment noncompliance, and substance abuse were associated with lower rates or delayed onset of recovery.

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**Psychotic Affective disorders are recognized as distinct categories of affective illness in the recent editions of the Diagnostic and Statistical Manual of Mental Disorders but have been rarely studied. Patients who experience psychosis during affective episodes may be at risk for poor outcome, particularly those with mood-incongruent psychotic symptoms. Since mood-incongruent psychosis has been traditionally associated with schizophrenia, these symptoms may identify a particularly severe form of affective illness more closely related to schizoaffective disorder than mood-congruent psychotic or nonpsychotic affective disorders. Unfortunately, as there are few prospective studies of affective psychosis, factors that affect the course of illness are not well defined.

Clinical characteristics that have been associated with poor outcome in affective illness in general include older age, male sex, minority race, poor premorbid function, mixed affective states, low socioeconomic status (SES), substance abuse, duration of illness, and treatment noncompliance. Whether these characteristics are also outcome predictors in psychotic affective illness remains unclear. Moreover, since these variables are often highly correlated in patient samples, analyses should control for potential interactions, but this has been inconsistently done. Multivariate analyses might clarify these interactions.

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For example, a multivariate approach might identify whether substance abuse contributes to poor outcome directly by influencing symptoms or indirectly by contributing to treatment noncompliance.

Previously, Tohen et al developed operational criteria to differentiate symptomatic, syndromic, and functional recovery. Syndromic recovery refers to the resolution of a specific constellation of symptoms such that diagnostic criteria are no longer met, whereas symptomatic recovery is a measure of improvement in the overall magnitude of psychiatric symptoms. Functional recovery is the return to


SUBJECTS AND METHODS

SUBJECTS

Patients were recruited from consecutive admissions to the University of Cincinnati Hospital, Cincinnati, Ohio, inpatient psychiatric units from October 1992 through May 1995. University of Cincinnati Hospital is a regional tertiary-referral center and a primary care provider. It serves a primarily poor urban population and manages the local indigent acute care unit, although it also provides care to University of Cincinnati students. Most patients are admitted through the Psychiatric Emergency service, which manages approximately 10,000 visits annually.20

Patients were included if they (1) were aged 15 to 45 years; (2) met DSM-III-R criteria for bipolar or major depressive disorders with psychosis; (3) had no previous psychiatric hospitalizations, less than 3 months of previous antipsychotic or mood stabilizer treatment, and less than 6 months of previous antidepressant treatment (verified by interviews with the patient and family members and review of medical records); (4) could communicate in English; (5) resided within the Cincinnati metropolitan area; and (6) could fully understand the study procedures and provide written informed consent. Patients were excluded if psychotic symptoms (1) resulted entirely from acute intoxication or withdrawal from drugs or alcohol as determined by symptom resolution within the expected period of acute intoxication and withdrawal as described previously21; or (2) resulted entirely from a medical illness as determined by medical evaluation.

All new psychiatric admissions were reviewed daily, and a total of 254 potential study subjects were identified, of whom 117 (46.1%) met inclusion and exclusion criteria. Of these, 109 (93.2%) provided written informed consent and are the subjects of this report. Eight patients refused to participate in interviews with the patient and family members and review of medical records; (4) could communicate in English; (5) resided within the Cincinnati metropolitan area; and (6) could fully understand the study procedures and provide written informed consent. Patients were excluded if psychotic symptoms (1) resulted entirely from acute intoxication or withdrawal from drugs or alcohol as determined by symptom resolution within the expected period of acute intoxication and withdrawal as described previously21; or (2) resulted entirely from a medical illness as determined by medical evaluation.

All new psychiatric admissions were reviewed daily, and a total of 254 potential study subjects were identified, of whom 117 (46.1%) met inclusion and exclusion criteria. Of these, 109 (93.2%) provided written informed consent and are the subjects of this report. Eight patients refused to participate in this study or were discharged too rapidly to be recruited. These patients did not significantly differ from the remaining subjects on any demographic variable.

DEMOGRAPHIC VARIABLES

Age, sex, race, educational achievement, and SES (the highest employment level before the onset of symptoms) were recorded. The SES was scored as follows: 0, student; 1, skilled/professional worker; 2, semiskilled manual laborer; and 3, unskilled laborer or unemployed.

DIAGNOSTIC ASSESSMENTS

Axis I psychiatric diagnoses were assessed at the index hospitalization and 12-month follow-up by means of the Structured Clinical Interview for DSM-III-R, Patient Version,22 performed by psychiatrists (S.M.S., P.E.K., S.L.M., and S.A.W.), with good interrater reliability for principal (κ=0.94) and comorbid (κ>0.90) diagnoses.23 In addition, the youngest age that a full affective syndrome could be identified was defined as the age at onset of the affective illness (intraclass correlation coefficient [ICC]=0.90). To complete the Structured Clinical Interview for DSM-III-R, Patient Version (SCID-P), information was obtained from the patient, medical records, clinicians, and family members.

Mood-incongruent psychosis was identified by means of DSM-III-R criteria during the SCID-P. Delusions and hallucinations were considered mood-incongruent if they did not involve manic or depressive themes, eg, thought insertion or nonverbal persecutory delusions.9 If both mood-congruent and mood-incongruent psychotic symptoms were present, the interviewer made a final diagnosis based on the relative severity of each.9

SYMPTOM ASSESSMENT

Symptoms were rated within 3 days of admission by research assistants using the Young Mania Rating Scale (YMRS),23 17-item Hamilton Depression Rating Scale (HAMD),24 Scale for the Assessment of Positive Symptoms (SAPS),23 Scale for the Assessment of Negative Symptoms (SANS),26 and Global Assessment Scale (GAS).27 Raters had established interrater reliability from joint ratings of more than 100 patients with an experienced psychiatric research nurse (K.C.T.) as follows: HAMD total, ICC=0.94; YMRS total, ICC=0.71; SAPS global scores, ICC=0.72 to 0.93; SANS global scores, ICC=0.55 to 0.73; and GAS, ICC=0.73.

PREMORBID ASSESSMENT

Premorbid function was assessed by research assistants using the nine general items from the Premorbid Adjustment Scale (PAS)28 that evaluate ability to live independently outside the nuclear family, form peer relationships, and maintain interest in life’s pursuits. To minimize potential effects of prodromal symptoms, ratings were obtained for the highest level of function in the 3 years ending 6 months before hospitalization during a time when patients believed they were doing well. The PAS yields a score between 0 and 1, with higher scores representing poorer function.

OUTCOME ASSESSMENTS

Follow-up visits were scheduled for 2, 6, and 12 months after discharge, although they actually occurred at means (±SDs) of 2.6±1.1, 6.4±0.9, and 13.6±2.7 months, respectively. The rationale for these intervals is based on work described previously.4,11,29 To assess recovery at each visit, come obscured in chronically ill or multiple-episode samples, where illness chronicity becomes the most robust predictor of outcome.11,14,16 In this sample, we asked the following questions: (1) Does mood-incongruent psychosis predict poor recovery? (2) Do substance abuse and treatment noncompliance independently contribute to poor outcome? (3) Are there different predictors of syndromic, symptomatic, and functional recovery?
CHARACTERISTICS OF THE SAMPLE

Clinical, demographic, and outcome variables are listed in the Table. The 84 patients (77%) who completed the 12-month protocol were used for logistic regression analyses. The 94 patients (86%) who attended at least 1 follow-up visit were used for survival analyses. The recovery curves for these patients are illustrated in Figure 1.

Twenty-five patients failed to complete the study. Thirteen (52%) of these refused further participation, whereas the remaining 12 (48%) could not be located. Although direct follow-up assessments were not possible in these patients, from collateral reports it ap-

interviewers concentrated on change points, times when symptoms or function improved or worsened, corresponding to the methods of the Longitudinal Interval Follow-up Evaluation.29

Symptomatic recovery was defined as 8 contiguous weeks30 during which minimal psychiatric symptoms were present, operationalized as follows: manic syndrome: no longer meeting the DSM-III-R “A” or “B” criteria for a manic episode; depressive syndrome: no longer meeting the DSM-III-R “A” criterion for a major depressive episode; and psychotic syndrome: no longer demonstrating any characteristic symptom of the DSM-III-R “A” criterion for schizophrenia and having fewer than 2 DSM-III-R-defined residual symptoms.2

Sympotmatic recovery was defined as 8 contiguous weeks30 during which minimal psychiatric symptoms were present, operationalized as follows: YMRS total score of 5 or less, HAMD total score of 10 or less,11 SANS global items of 2 or less (mild), SANS global items of 3 or less (mild), and GAS score higher than 60.32 These scores were chosen to correspond to the “residual symptoms or usual self” (1 or 2) ratings of the Longitudinal Interval Follow-up Evaluation29 and may be somewhat higher than asymptomatic ratings used in other studies.

Functional recovery was defined as a return to premorbid levels of function for at least 8 contiguous weeks,30 operationalized as interval PAS scores less than or equal to the premorbid rating on 5 of 7 items (ratings of education and abruptness in the change in work were not included in this definition, since they could not change) and no interval score more than 2 points higher than the premorbid score.

New affective episodes were recorded by identifying switches from different affective states (eg, mania to depression) or by identifying a new episode that occurred after a euthymic period of at least 2 weeks.9 This interval identifies both relapses (return of symptoms after a remission of <8 weeks) and recurrences (return of symptoms after recovery).30 Substance abuse was assessed by reviewing DSM-III-R criteria for alcohol and drug abuse syndromes at each visit. Finally, treatment compliance was defined as follows:17

(1) full compliance: evidence from the patient, clinician, and significant others that medication was taken as prescribed;

(2) partial noncompliance: evidence that some medications were not taken consistently, or that most or all medications were taken intermittently or at dosages lower than prescribed; or

(3) total noncompliance: evidence of complete discontinuation of all psychotropic medication.

To improve validity of the outcome measures, “best-estimate” meetings were held after the completion of the 12-month visits.31 These meetings included at least 2 psychiatrists (S.M.S., J.M.H., or P.E.K.) or a psychiatrist (S.M.S.) and a PhD-level psychologist (K.W.S.), in addition to several research assistants, and involved reviewing all assessments from the index hospitalization and follow-up evaluations, the 12-month diagnostic interview, and any available clinical records. Information from these multiple sources was compared and a consensus among the research team members was obtained for the occurrence and timing of recovery measures, and for ratings of interval substance abuse, affective episodes, and treatment compliance. These best-estimate determinations were used for all analyses. To evaluate the reliability of this process, we repeated best estimates on 20 patients more than 1 month after completion of all subjects, with agreement as follows: syndromic recovery (100%; N=20), symptomatic recovery (100%; N=20), functional recovery (95%; N=19), interval substance abuse (95%; N=19); compliance (90%, N=18); and new affective episode (90%; N=18).

The method for this study (eg, the 8-week duration for recovery, the symptom recovery cutoff scores, and the timing of new affective episodes) was developed from previous studies and expert panel recommendations.4,7,13,15,16,30

RISK FACTORS

From the previous considerations,4,5,9-18 12 risk factors were identified: sex, race, premorbid function, SES, current age, duration of illness (current age minus age at onset), index GAS score, diagnosis (bipolar disorder or major depression), affective state (depressed, mixed, or manic), mood-incongruent psychosis, treatment compliance, and interval substance abuse syndromes. These factors were carefully selected to limit the number of dependent variables.34

STATISTICAL ANALYSIS

Analyses were performed with the Statistical Analysis System for the Personal Computer (SAS Institute Inc, Cary, NC). Logistic regression models including all 12 risk factors were used to identify significant predictors of dichotomous outcome variables (eg, the presence or absence of syndromic recovery). Adjusted odds ratios (ORa) and 95% confidence intervals (CIs) were calculated for dichotomous dependent variables.

Kaplan-Meier survival curves35 were used to estimate the probability of recovery, scored as present at the time that it began, and were compared between groups by the log-rank (Savage) test. Cox proportional hazard regression models were used to assess the effects of the 12 risk factors on the time to the outcome events. All covariates were examined to ensure that they met the proportional hazards assumption for these regression models,34 and none exhibited significant deviance from this assumption. Adjusted hazard ratios (HRa) and 95% CIs were computed for each risk factor, adjusting for all the remaining variables. Other statistical comparisons were performed as necessary for completeness.
Demographic, Clinical, and Outcome Characteristics of 109 Patients at Their First Hospitalization for Affective Psychosis

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Bipolar Disorder (n=53)</th>
<th>Major Depression (n=56)</th>
<th>Total (N=109)</th>
</tr>
</thead>
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<tr>
<td>Age, y</td>
<td>25±6</td>
<td>27±8</td>
<td>26±7</td>
</tr>
<tr>
<td>Age at onset, y</td>
<td>22±7</td>
<td>22±9</td>
<td>22±7</td>
</tr>
<tr>
<td>Male sex</td>
<td>46 (55)</td>
<td>14 (54)</td>
<td>60 (55)</td>
</tr>
<tr>
<td>White race†</td>
<td>37 (45)</td>
<td>5 (19)</td>
<td>42 (39)</td>
</tr>
<tr>
<td>Socioeconomic status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student</td>
<td>19 (23)</td>
<td>5 (19)</td>
<td>24 (22)</td>
</tr>
<tr>
<td>Skilled/professional</td>
<td>15 (18)</td>
<td>4 (15)</td>
<td>19 (17)</td>
</tr>
<tr>
<td>Semiskilled</td>
<td>9 (11)</td>
<td>5 (19)</td>
<td>14 (13)</td>
</tr>
<tr>
<td>Unskilled/unemployed</td>
<td>40 (48)</td>
<td>12 (46)</td>
<td>52 (48)</td>
</tr>
<tr>
<td>Premorbid function rating</td>
<td>0.26±0.16</td>
<td>0.37±0.18</td>
<td>0.28±0.17</td>
</tr>
<tr>
<td>Score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>YMRS</td>
<td>25±11</td>
<td>14±8</td>
<td>23±12</td>
</tr>
<tr>
<td>HAMD</td>
<td>15±8</td>
<td>18±9</td>
<td>15±9</td>
</tr>
<tr>
<td>SAPS</td>
<td>9±4</td>
<td>7±3</td>
<td>9±4</td>
</tr>
<tr>
<td>SANS</td>
<td>8±5</td>
<td>11±5</td>
<td>9±5</td>
</tr>
<tr>
<td>GAS</td>
<td>36±13</td>
<td>40±11</td>
<td>37±12</td>
</tr>
<tr>
<td>Treatment at discharge</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>AD only</td>
<td>5 (6)</td>
<td>2 (8)</td>
<td>7 (6)</td>
</tr>
<tr>
<td>MS only§</td>
<td>16 (19)</td>
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<td>16 (15)</td>
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<tr>
<td>AP only</td>
<td>5 (6)</td>
<td>5 (19)</td>
<td>10 (9)</td>
</tr>
<tr>
<td>AD+AP§</td>
<td>4 (5)</td>
<td>10 (38)</td>
<td>14 (13)</td>
</tr>
<tr>
<td>MS+AP§</td>
<td>47 (57)</td>
<td>2 (8)</td>
<td>49 (45)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (1)</td>
<td>2 (8)</td>
<td>3 (3)</td>
</tr>
<tr>
<td>No medication</td>
<td>5 (6)</td>
<td>5 (19)</td>
<td>10 (9)</td>
</tr>
<tr>
<td>Completed the study</td>
<td>64 (77)</td>
<td>20 (77)</td>
<td>84 (77)</td>
</tr>
<tr>
<td>Interval substance abuse</td>
<td>19 (30)</td>
<td>10 (50)</td>
<td>29 (35)</td>
</tr>
<tr>
<td>Treatment compliance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full compliance</td>
<td>26 (41)</td>
<td>7 (35)</td>
<td>33 (39)</td>
</tr>
<tr>
<td>Partial noncompliance</td>
<td>17 (26)</td>
<td>8 (40)</td>
<td>25 (30)</td>
</tr>
<tr>
<td>Total noncompliance</td>
<td>21 (33)</td>
<td>5 (25)</td>
<td>26 (31)</td>
</tr>
<tr>
<td>Recovery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Syndromic†</td>
<td>39 (61)</td>
<td>8 (40)</td>
<td>47 (56)</td>
</tr>
<tr>
<td>Symptomatic†</td>
<td>25 (39)</td>
<td>4 (20)</td>
<td>29 (35)</td>
</tr>
<tr>
<td>Functional†</td>
<td>23 (36)</td>
<td>6 (30)</td>
<td>29 (35)</td>
</tr>
<tr>
<td>New manic episode¶</td>
<td>30 (47)</td>
<td>1 (5)</td>
<td>31 (37)</td>
</tr>
<tr>
<td>New depressive episode¶</td>
<td>37 (58)</td>
<td>5 (25)</td>
<td>42 (50)</td>
</tr>
</tbody>
</table>

* Data are given as mean±SD and number (percentage) of patients. YMRS indicates Young Mania Rating Scale; HAMD, Hamilton Depression Scale; SAPS, Scale for the Assessment of Positive Symptoms; SANS, Scale for the Assessment of Negative Symptoms; GAS, Global Assessment Scale; AD, antidepressant; MS, mood stabilizer; and AP, antipsychotic.
† No whites were primarily African American (N=47, 92%).
‡ Includes 5 subjects with previous untreated hypomanias, and 1 who switched from mania to psychotic depression at the time of admission.
§ Significant difference between diagnoses. Fisher exact test (2-tailed), P<.05.
¶ Percentages based on the number of 12-month study completers.
¶¶ One additional subject recovered at 2 months who did not complete the study.

Figure 1. Recovery curves of 94 patients followed up for 12 months after a first hospitalization for an affective psychosis. Symptomatic recovery is identified by squares, symptomatic recovery by triangles, and functional recovery by circles. The number of subjects remaining who had not yet achieved recovery and had not dropped out at each 2-month interval are identified below the graph.

TREATMENT AND COMPLIANCE

Diagnostic differences in treatment at discharge were observed (Table; χ²=44.6, df=7, P=.001), although the type of medication prescribed was not associated with any outcome variable. At 12 months, diagnostic differences in current treatment persisted, although they were less pronounced (χ²=17.1, df=7, P=.02). At that time, 23 patients (27%) were receiving no medication.

Logistic regression disclosed that only race (ORa, 2.6; 95% CI, 1.1-6.4; P=.04) and interval substance abuse (ORa, 2.7; 95% CI, 1.1-6.6; P=.03) were associated with compliance. Specifically, whites were more likely to exhibit full compliance (N=19/33, 58%) than nonwhites (N=14/51, 27%); and patients with substance abuse were less likely to achieve full compliance (N=6/29, 21%) than those without (N=27/55, 49%).

SYNDROMIC RECOVERY

Logistic regression showed that only treatment compliance was associated with syndromic recovery (adjusted χ²=4.1, df=1; P=.04). Specifically, 73% (N=24) of patients with full compliance recovered, compared with 54% (N=14) with total noncompliance and 36% (N=9) with partial noncompliance. Cox regression showed that treatment compliance was the only significant risk factor for time to recovery (Figure 2; HRa, 0.6; 95% CI, 0.4-0.95; P=.03). Analysis of the survival curves showed a significant difference only between full compliance and partial noncompliance (log-rank test, χ²=10.3, df=1; P=.001).
adjusted

By definition, everyone who achieved symptomatic recovery (achieved both approximately concurrently. Syndromic recovery at least 1 month previously, with the remainder achieving both approximately concurrently. Syndromic recovery occurred in 27 (93%) patients achieving functional recovery and preceded functional recovery by more than 1 month in 12 (44%). Symptomatic recovery occurred in 20 (69%) patients with functional recovery, preceded functional recovery by more than 1 month in 6 (30%), and occurred more than 1 month later in 3 (15%).

INTERVAL AFFECTIVE EPISODES

New manic episodes were only associated with diagnosis (ORA, 17.8; 95% CI, 1.2-259.7; P = .04). New depressive episodes were not significantly associated with any risk factor.

MIXED VS MANIC BIPOLAR DISORDER

Since mixed states have been associated with outcome, we examined associations between index affective state and recovery in the 60 completers with mixed (N = 21) or manic (N = 39) bipolar disorder. In this subgroup, affective state was not significantly associated with syndromic or symptomatic recovery. However, 11 (52%) of mixed compared with 11 (28%) of manic patients recovered functionally (ORA, 5.6; 95% CI, 1.1-28.6; P = .04).

SYMPTOMS

An exploratory analysis of potential associations between outcome variables and the total scores from the HAMD, YMRS, SANS, and SAPS, and the presence or absence of first-rank symptoms from the SAPS revealed no significant associations.

In this study, only 35% of patients returned to premorbid function or had symptoms resolve 1 year after hospitalization. Only 56% even experienced enduring resolution

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of affective and psychotic syndromes. In contrast, Tohen et al reported syndromic recovery in 82% and functional recovery in 59% of 68 patients with affective psychoses 6 months after the first hospitalization. However, their sample was predominantly upper- and middle-class college-educated patients, and therefore quite different socioeconomically from our patient group. Iacono and Beiser found that 40 (55%) of 73 patients with first-episode affective psychoses recovered by 9 months, although patients with substance abuse were excluded. The differences in outcome among these studies likely reflect the differences in the study populations and provide indirect evidence for the influence of SES and substance abuse on the course of affective psychoses, factors we directly observed to be associated with recovery.

Our findings are consistent with other studies of affective illness. Goldberg et al observed that only 14 (27%) of 51 patients with bipolar disorder were functioning well 2 years after hospitalization. In a study of 73 patients with bipolar disorder, Tohen et al observed that 29 (40%) were unable to work or study 6 months after hospitalization. In a 2-year longitudinal study of more than 80 patients with bipolar disorder, Gitlin et al found that most experienced persistent symptoms, with only 28% achieving good occupational outcome, even though these patients were well educated and aggressively treated. Together, these studies suggest that a substantial proportion of patients with affective illness experience persistent impairment beginning as early as the first hospitalization.

We separated recovery into syndromic, symptomatic, and functional components. Different risk factors were associated with each of these components, supporting this approach. Although the 3 aspects of recovery commonly co-occurred, this was not always true. Moreover, syndromic recovery frequently predated symptomatic and functional recovery as the first step in the recovery process. Symptom resolution commonly predated functional improvement as well, suggesting that recovery proceeds through stages during which different clinical and sociodemographic variables become more or less important. For example, although full treatment compliance may be sufficient to initiate syndromic recovery, additional interventions (eg, psychosocial rehabilitation) may be necessary for symptomatic and functional recovery.

Socioeconomic status was associated with both symptomatic and functional recovery, as students had better outcomes than the remaining groups. The reasons for this are not clear, but the finding may reflect the more extensive support systems available to students through school and school-related peers. Similarly, good premorbid function was associated with functional recovery, again possibly reflecting the importance of premorbid psychosocial supports for reestablishing interpersonal and work or school relationships after an affective psychosis.

Not surprisingly, patients with full treatment compliance were more likely to achieve syndromic recovery than those without it. Notably, patients with total noncompliance had better recovery rates than those with partial noncompliance and nonsignificantly lower rates than those with full compliance. However, most patients who failed to complete the study also stopped all treatment, and many of these appeared to be doing poorly. Thus, those patients with total noncompliance having the worst outcome were underrepresented in the follow-up evaluations, possibly skewing the results toward a more favorable outcome for that patient subgroup.

Only one quarter of nonwhite patients achieved full treatment compliance. Why so few nonwhite patients successfully engaged in outpatient treatment could not be determined, but others have suggested that ethnic differences in the perceived importance of treatment or cultural distance between predominantly white clinicians and nonwhite patients may influence the likelihood of attending outpatient treatment.

Substance abuse appears to worsen outcome through its association with treatment noncompliance, since patients abusing alcohol and other drugs were less likely to adhere to medication regimens. However, substance abuse was also associated with delayed onset of symptomatic remission after adjusting for differences in treatment compliance. Thus, substance abuse appears to have both direct and indirect effects on the course of affective illness.

Mood-incongruent psychosis was not associated with recovery. Previous studies in which mood-incongruent psychosis was associated with outcome did not typically adjust for the sociodemographic variables controlled for in this analysis, however. In previous reports, it was suggested that sociodemographic factors may influence the content of psychotic symptoms, so that when sociodemographic variables are considered, the importance of mood-incongruent symptoms on outcome may become less pronounced. Similarly, diagnosis and affective state were not associated with outcome in these patients, although in the bipolar subgroup, mixed-state patients had better functional outcome than those with mania, in contrast to some previous studies. However, the low rates of recovery in general coupled with the more profound effects of poor SES, substance abuse, and treatment noncompliance may have obscured the effects of diagnosis and state, so this finding should be interpreted cautiously.

Most patients developed at least 1 additional affective episode in the year after hospitalization, consistent with previous studies. Nearly half of the patients with bipolar disorder developed a new manic episode, as did 1 patient with an index diagnosis of major depression. This rate of switch from unipolar depression to bipolar disorder (4%) is similar to that reported by others.

Some limitations should be considered when interpreting these results. First, only hospitalized patients at a single treatment center were studied, so the results may not be generalizable to other treatment settings. Second, the measures of recovery used were similar, but not identical, to those in previous studies, and, to our knowledge, this was the first study to examine functional, symptomatic, and syndromic recovery. This may limit comparisons with some previous studies. Third, although duration of illness was examined in this study, the specific duration of the index episode was not. Index episode duration has been associated with outcome in some previ-
ous studies\(^3\) and may influence premorbid ratings. Finally, medication levels were not obtained as part of this protocol. Therefore, compliance ratings were entirely based on reports from patients, clinicians, and family members, so they may have been biased. However, previous studies that examined plasma medication levels to measure compliance found no higher rates of noncompliance than did studies relying on patient self-report.\(^{42}\) Despite these limitations, these results suggest that a substantial proportion of patients with affective psychoses experience unfavorable outcome even early in the course of the illness.

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REFERENCES