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After completing this CME activity, participants should be able to:

• Assess the usefulness of the Brief Psychiatric Rating Scale-Anchored as a diagnostic tool.

Statement of Need and Purpose

Rating scales can be efficient, timesaving tools to aid in the diagnosis and treatment of psychiatric illness, but are often underused in clinical practice. This CME activity was designed to meet the needs of physicians who have requested information on the diagnosis and treatment of psychiatric illnesses. There are no prerequisites for participation in this CME activity.

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Faculty Disclosure

In the spirit of full disclosure and in compliance with all ACCME Essential Areas and Policies, the faculty for this CME activity were asked to complete a full disclosure statement. The information received is as follows:

Drs. Averill, Hopko, and Varner, Ms. Greenlee, and Mr. Small have no significant commercial relationships to disclose relative to the presentation.

Disclosure of Off-Label Usage

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Use of the Brief Psychiatric Rating Scale to Facilitate Differential Diagnosis at Acute Inpatient Admission

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Background: The advent of managed care has necessitated strategies for quickly and accurately diagnosing psychiatric disorders. The aim of the present study was to ascertain whether the Brief Psychiatric Rating Scale-Anchored (BPRS-A) would be a useful adjunct to more traditional diagnostic strategies at acute inpatient admission.

Method: Using a sample of 207 inpatients admitted during an 8-month index period, we examined the utility of the BPRS-A in predicting whether patients were more likely to be diagnosed with schizophrenia, bipolar disorder, or major depression (DSM-IV).

Results: Discriminant function analyses were used to correctly predict 68%, 60%, and 74% of patients diagnosed with schizophrenia, bipolar disorder, and major depression, respectively. The main predictors of diagnostic category, in descending order, were BPRS-A depressed mood item, BPRS-A positive symptoms scale, BPRS-A excitement item, BPRS-A guilt feelings item, BPRS-A mannerisms and posturing item, and number of previous episodes.

Conclusion: As efforts are directed toward continuous quality improvement within mental health settings, an emphasis must be placed on improving the efficiency and accuracy of diagnostic procedures. The BPRS-A shows promise as a time-efficient assessment instrument that may be useful in facilitating differential diagnosis at inpatient admission and may increase the likelihood that efficacious prerelease interventions and appropriate aftercare services are implemented. (J Clin Psychiatry 2001;62:304–312)

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he origination and expansion of the managed behav-ioral health care industry have resulted in significant changes in the provision of mental health services. The impact of managed care is quite extensive, ranging from widespread effects in the training and practice of clinical practitioners¹⁻³ to significant reductions in duration of treatment in both inpatient and outpatient settings.^{4,5} A problematic outgrowth of these changes has been an increased focus on time-limited treatment and cost-containment mechanisms that may negatively affect treatment efficacy.^{6,7} Moreover, within the field of mental health, the application of continuous quality improvement (CQI) has lagged behind its application within other health care services.8 To address these problems, researchers should focus on those factors that may increase the efficacy of time-limited mental health care and simultaneously improve the accountability of mental health providers.

Only recently has a movement toward the application of CQI within an inpatient mental health setting been initiated.⁹ In general, CQI refers to the application of scientific methodology as it relates to improvement of coordination of care among health care providers and the provision of health care services. Based on this paradigm, problems related to quality of care are not a function of employee characteristics (e.g., effort, skill level), but rather of the way their work is organized.⁹ Accordingly, the primary objectives of CQI involve (1) the application of problem-solving techniques to improve treatment outcome; (2) systematic monitoring, evaluation, and improvement with regard to the efficiency of work procedures; and (3) the implementation of a plan to address problems and better enable an organization to achieve its goals.

Consistent with the CQI philosophy, the present study was designed to focus on quality improvement within the Harris County Psychiatric Center (HCPC), an inpatient mental health setting located in Houston, Tex. Specifically, the objective was to make progress toward improving the quality of initial diagnostic assessment procedures to expedite implementation of an appropriate treatment intervention.^{10,11} This research was prompted by a problem that is perhaps common to many inpatient mental health facilities: the barriers that may prevent medical staff from making a time-efficient and accurate diagnosis. Among these obstacles are an unwillingness (e.g., involuntary patients) or inability of patients to communicate psychiatric symptoms effectively to medical personnel.¹² Additionally, clinical presentations often are complex enough that initial diagnostic impressions may be quite different from those that are made following more extensive assessment and observation. For example, data collected over a 1-year index period at HCPC (N = 5248; September 1998 through August 1999) revealed that 9% and 13% of patients received a discharge diagnosis of psychotic disorder not otherwise specified (NOS) and major depression, respectively. These figures are compared with admission diagnoses (over the same time period) showing that 30% and 25% of patients were admitted with diagnoses of psychotic disorder NOS and major depression, respectively. Indeed, researchers have shown that failure to respond to treatment may in part be a function of inaccurate diagnosis.¹³ The problem is made even more complex when 40% of patients are presenting with their first episode, when a psychiatric history may not be available.

Given the importance of psychiatric diagnosis in guiding treatment intervention, together with the necessity to diagnose psychopathology in a time-limited manner, the need arises to identify assessment strategies that may facilitate this process. These strategies traditionally have included diagnostic interviews, review of preexisting medical records, information obtained from a third party, and psychological assessment. With regard to the latter approach, a number of assessment instruments have demonstrated clinical utility within an inpatient setting. Included in this list are the Structured Clinical Interview for DSM-III-R¹⁴ and the Anxiety Disorders Interview Schedule for DSM-IV.¹⁵ In spite of the excellent psychometric properties of structured interviews, they may be impractical as inpatient screening instruments for 2 reasons: they either take a significant amount of time to administer or are unique to specific diagnoses.

In response to these limitations, clinician-based rating scales frequently have been used to systematically assess for psychiatric illness. One instrument that has been utilized in this capacity is the Brief Psychiatric Rating Scale (BPRS).^{16,17} This clinician-rated instrument was created as an efficient broad-spectrum measure that can be used routinely and repetitively as a reliable and valid indicator of psychiatric symptoms and has been used extensively in

inpatient psychiatric settings.^{18–20} In spite of its widespread use, the BPRS has been applied primarily as an outcome measure to examine the efficacy of treatment interventions.^{21–23} For the purpose of the present study, it was conceivable that the BPRS would provide a substantive amount of information to facilitate clinical decision making in a time-efficient manner.

To examine the utility of the BPRS-Anchored (BPRS-A) in improving the quality of diagnostic assessment, we focused on evaluating the usefulness of this measure among patients with severe mental illness. Indeed, individuals with schizophrenia or other psychoses tend to be hospitalized with greater frequency than individuals manifesting other psychiatric illness.²⁴⁻²⁶ There also is evidence to suggest that individuals with nonaffective psychosis, bipolar disorder, and major depression are among the heaviest users of outpatient services.^{27,28} Given this extensive service utilization, the prevalence of these conditions,²⁹ and associated difficulties in differential diagnosis,^{30,31} emphasis must be placed on continued exploration of factors that may differentiate among these diagnostic categories. Accomplishing this goal may result in improved diagnostic strategies, more comprehensive treatment, and reduced rates of hospital readmission. Indeed, early detection of psychotic disorders, such as schizophrenia, has been shown to greatly increase the likelihood of a favorable long-term outcome and relapse prevention.32

There is a significant overlap in the clinical presentation of schizophrenia, bipolar disorder, and major depression. Symptoms including negative affect, delusions, and difficulty concentrating may be experienced commonly among patients with each of these diagnoses.³³ To address this issue, researchers have begun to examine factors that may distinguish among these individuals. For example, a significant research effort has been dedicated toward brain imaging studies that have found differential brain function among diagnostic groups.^{34,35} A potentially more practical finding, as it relates to clinical diagnosis, is the notion that negative symptoms appear to be a more prominent feature of schizophrenia than either major depression or bipolar disorder.³⁶ Investigations of this latter sort are relatively limited, particularly with regard to the sensitivity of psychological assessment instruments in facilitating differential diagnosis. Given the relative cost- and timeeffectiveness of brief psychological assessment, we argue that there is an urgent need to further explicate differential symptom patterns that may be recognized using clinician-based rating instruments. The present study was designed to examine the utility of the BPRS-A as an adjunct to more traditional diagnostic assessment strategies at acute psychiatric inpatient admission. Our objective was to establish (1) whether the BPRS-A could be used to facilitate the process of differential diagnosis in an acute inpatient setting, thereby assisting in more rapid treatment decisions, and (2) whether this instrument would be sensitive to treatment intervention provided within this context.

METHOD

Participants

The sample consisted of 207 patients hospitalized during an index period of 8 months (February through September 1999) at the HCPC, a university-affiliated 250-bed acute-treatment psychiatric hospital that serves the greater Houston, Tex., metropolitan area. The hospital provides most of the indigent care in Harris County, providing brief psychiatric services (i.e., in 1999, mean = 10.1 days) to individuals with serious mental illness.

Randomization procedures consisted of including every fourth inpatient admitted during the study period. Using this method, although data were collected from 289 patients, only individuals who received a primary discharge diagnosis of schizophrenia, bipolar disorder, or major depression $(DSM-IV)^{15}$ were included in the study (N = 207). Within these diagnostic categories, there was some heterogeneity among patients. In the schizophrenic group (N = 75), specific diagnoses were as follows: paranoid type (N = 41), undifferentiated type (N = 26), disorganized type (N = 7), and catatonic type (N = 1). In the bipolar disorder group (N = 67), specific diagnoses were as follows: bipolar I, most recent episode manic with psychotic features (N = 27); bipolar I, most recent episode manic (N = 13); bipolar I, most recent episode depressed (N = 8); bipolar I, most recent episode depressed with psychotic features (N = 7); bipolar I, most recent episode mixed (N = 5); bipolar NOS (N = 5); and bipolar II (N = 2). In the major depression group (N = 65), specific diagnoses were as follows: major depression, recurrent, with psychotic features (N = 24); major depression, recurrent (N = 23); major depression, single episode (N = 6); major depression, single episode, with psychotic features (N = 5); and depression NOS (N = 7).

The sample consisted of 110 men (53%) and 97 women (47%), with a mean \pm SD age of 36.7 \pm 10.2 years. Ethnic distribution consisted of 97 African American (47%), 75 white (36%), 30 Hispanic (15%), and 5 Asian American (2%) patients. Marital status was as follows: 128 single (62%), 33 divorced (16%), 22 separated (11%), 20 married (10%), 2 widowed (1%), and 2 unknown (1%). The

mean ± SD number of lifetime admissions for patients was 4.4 ± 4.9 , and the mean length of stay of the current episode was 9.8 ± 6.3 days. These data are consistent with HCPC patient demographic data (N = 5248) collected over a 1-year index period (September 1998-August 1999). These data revealed that men comprise 55% of HCPC admissions (women = 45%). Mean age at admission was 34.6 years. Ethnic distribution was as follows: 43% African American, 39% white, 15% Hispanic, and 2% Asian American. The marital status of patients consisted of 63% single, 15% divorced, 11% married, 6% separated, 3% widowed, and 2% unknown. The mean length of stay was 10.1 days. Given the similarities across data sets, our sample was assessed to generalize to the more extensive HCPC population. Demographic data by diagnostic group are presented in Table 1.

Measures

The BPRS-A³⁷ is a clinician-based rating instrument consisting of 18 items that describe various manifestations of psychopathology. Items, or areas of pathology, are rated on a 7-point scale ranging from "not present" to "very severe," and behavior examples, or anchors, are provided for each item's rating options. Consistent with previous research,³⁸ item responses were weighted from 1 to 7. Reliability and validity of the BPRS have been well documented across studies.¹⁶⁻¹⁸ Recently, psychometric analysis has supported the application of 4 factor-derived dimensions of the BPRS-A in acute inpatient settings (D. Lachar, Ph.D.; S. E. Bailley, Ph.D.; A. Espadas, M.A.; et al., manuscript submitted, 2000). These 4 scales are described in Table 2: resistance (noncompliance and agitation), positive symptoms (hallucinations and unusual thoughts), negative symptoms (blunted affect and emotional withdrawal), and psychological discomfort (internalizing symptoms such as depression and anxiety). Adequate interrater reliability and scale validity have been established for these BPRS-A dimensions (D. Lachar, Ph.D.; S. E. Bailley, Ph.D.; A. Espadas, M.A.; et al., manuscript submitted, 2000).

Procedure

The BPRS-A was administered by 1 of 16 attending psychiatrists within 48 hours of patient admission. Because the scale items are fundamental constructs of psychopathology, no formal training on the BPRS-A was provided to attending psychiatrists. The instrument was designed with reference to the psychiatric elements of a routine mental status/psychiatric interview.¹⁸ Despite the absence of formal training on this measure, adequate reliability estimates for admission BPRS-A total score ratings

Table 1. Summary of	of Patien	t Dem	ographi	cs ^a			
	Schizop (N =	Bipo Disor (N =	olar der 67)	Maj Deprez (N =	Major Depression (N = 65)		
Variable	Ν	%	Ν	%	Ν	%	
Gender							
Male	49	65	35	52	26	40	
Female	26	35	32	48	39	60	
Ethnicity							
White	18	24	31	46	26	40	
African American	47	63	23	34	27	42	
Hispanic	8	11	10	15	12	18	
Asian American	2	3	3	4	0	0	
Marital status							
Single	57	76	41	61	30	46	
Married	3	4	8	12	9	14	
Divorced	7	9	12	18	14	22	
Widowed	0	0	0	0	2	3	
Separated	6	8	6	9	10	15	
Unknown	2	3	0	0	0	0	
HCPC episodes							
1	17	23	15	22	35	54	
2	8	11	14	21	13	20	
3	4	5	12	18	9	14	
4	7	9	3	4	2	3	
5–7	17	23	9	13	4	6	
> 7	22	29	14	21	2	3	
	Mean	SD	Mean	SD	Mean	SD	
Total HCPC episodes	6.2	6.4	4.5	4.1	2.2	2.3	
Length of stay, mo	10.3	5.8	9.8	6.1	9.1	7.0	
Age v	37.7	10.8	36.2	94	367	10.3	
^a Abbreviation: HCPC	= Harris (County	Psychiat	ric Ce	enter (Hou	ston,	

 $(\alpha = .76; N = 1556)$ and interrater reliability across attending psychiatrists ($\alpha = .70$) have been demonstrated within the context of HCPC.38 Moreover, although medical staff other than attending psychiatrists were not involved in the present study, recent research has demonstrated that other medical personnel (e.g., psychiatric nurses) may be trained to administer the BPRS-A reliably.23 Following the administration of the BPRS-A, ratings were entered into a database. Admission ratings were not available for reference at the time of patient discharge. In the majority of cases, the same attending psychiatrist completed both the admission and discharge BPRS-A. Due to HCPC policy that includes psychiatrist cross-coverage, in some cases the discharge BPRS-A was completed by a different psychiatrist. Patients were assigned to various units within the hospital and were therefore subject to different treatment teams. However, similar medications and therapeutic services were available across units. Additionally, the medical records of the 207 patients were audited for demographic information and data regarding history of hospitalization.

Table 2. Item Composition of Factor Scales of the Brief Psychiatric Rating Scale-Anchored					
Resistance	Negative symptoms				
Uncooperativeness	Blunted affect				
Hostility	Emotional withdrawal				
Excitement	Motor retardation				
Grandiosity					
Positive symptoms	Psychological discomfort				
Unusual thought content	Anxiety				
Conceptual disorganization	Somatic concern				
Hallucinatory behavior	Guilt feelings				
Suspiciousness	Tension				
Disorientation	Depressive mood				

Data Analysis

To examine potential differences among diagnostic groups, categorical data (i.e., demographic data) were analyzed using chi-square analyses. Fisher exact tests were used as follow-up analyses on significant chi-square results. Total and scale scores for admission BPRS-A ratings were calculated using item weights of 1 to 7. To determine whether clinician ratings differed across diagnostic groups, BPRS-A total and scale scores were examined using 1-way analyses of variance (ANOVAs), with diagnostic group as the independent variable. To assess potential group differences on a more specific level, additional individual BPRS-A item analyses were conducted across diagnostic groups.³⁹ A repeated-measures ANOVA was used to compare BPRS-A admission and discharge scores to determine the utility of the BPRS-A as a measure of treatment efficacy. For all statistically significant ANOVA results, Tukey honestly significant difference tests were used as post hoc analyses. Finally, stepwise multiple discriminant function analyses were used to determine the relative power of the BPRS-A and demographic and hospitalization variables in predicting diagnostic group membership.

RESULTS

Demographic Variables

Chi-square analyses revealed a significant effect for gender ($\chi^2 = 9.00$, df = 2, p < .05). Fisher exact tests indicated that men were more likely to be diagnosed with schizophrenia ($\chi^2 = 7.02$, df = 1, p < .01), whereas women were more likely to be diagnosed with major depression ($\chi^2 = 6.57$, df = 1, p < .01). Gender differences in the bipolar group were not significant. Chi-square analyses also indicated a significant effect for ethnicity ($\chi^2 = 16.10$, df = 6, p < .05). White patients were more likely to be diagnosed with bipolar disorder ($\chi^2 = 6.53$, df = 3, p < .01), whereas African Americans were more likely to be diagnosed with bipolar disorder ($\chi^2 = 6.53$, df = 3, p < .01), whereas African Americans were more likely to be diagnosed with bipolar disorder ($\chi^2 = 6.53$, df = 3, p < .01), whereas African Americans were more likely to be diagnosed with bipolar disorder ($\chi^2 = 6.53$, df = 3, p < .01), whereas African Americans were more likely to be diagnosed with bipolar disorder ($\chi^2 = 6.53$, df = 3, p < .01), whereas African Americans were more likely to be diagnosed with bipolar disorder ($\chi^2 = 6.53$, df = 3, p < .01), whereas African Americans were more likely to be diagnosed with bipolar disorder ($\chi^2 = 6.53$, df = 3, p < .01),

Table 3. Relation of BPRS-A Admission Ratings to DSM-IV Diagnostic Group^a

Schizoj	ohrenia	Bipolar Disorder		Major Depression			
Mean	SD	Mean	SD	Mean	SD	F	p Value
12.9	7.4	14.1	7.9	7.8	5.7	14.93	<.001
18.9	7.6	16.2	9.8	11.4	7.0	14.87	< .001
9.6	5.2	8.3	6.6	8.6	5.0	1.09	.34
14.2	7.9	16.4	9.6	17.5	6.7	2.85	.06
58.5	25.8	61.4	45.3	46.8	19.5	3.95	< .05
: BPRS	-A = B	rief Psy	/chiat	ric Rati	ng Sc	ale-Anc	hored.
	Schizo <u>j</u> Mean 12.9 18.9 9.6 14.2 58.5 :: BPRS	Schizophrenia Mean SD 12.9 7.4 18.9 7.6 9.6 5.2 14.2 7.9 58.5 25.8 :: BPRS-A = B	Schizophrenia Bipo Disor Mean SD Mean 12.9 7.4 14.1 18.9 7.6 16.2 9.6 5.2 8.3 14.2 7.9 16.4 58.5 25.8 61.4 :: BPRS-A = Brief Psy Brief Psy	Schizophrenia Bipolar Disorder Mean SD Mean SD 12.9 7.4 14.1 7.9 18.9 7.6 16.2 9.8 9.6 5.2 8.3 6.6 14.2 7.9 16.4 9.6 58.5 25.8 61.4 45.3 :: BPRS-A = Brief Psychiat Brief Psychiat	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Schizophrenia Mean SD Bipolar Disorder Mean SD Major Depression Mean SD 12.9 7.4 14.1 7.9 7.8 5.7 18.9 7.6 16.2 9.8 11.4 7.0 9.6 5.2 8.3 6.6 8.6 5.0 14.2 7.9 16.4 9.6 17.5 6.7 58.5 25.8 61.4 45.3 46.8 19.5 :: BPRS-A = Brief Psychiatric Rating Sci 5.2 5.2 5.3 5.2 5.3	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $

nosed with schizophrenia ($\chi^2 = 10.76$, df = 3, p < .001). In general, inpatients were more likely to be single than to have a marital history ($\chi^2 = 13.16$, df = 3, p < .001). Across diagnostic groups, individuals with schizophrenia were more likely to be single ($\chi^2 = 10.00$, df = 1, p < .001), whereas individuals with major depression were more likely to have a marital history ($\chi^2 = 9.87$, df = 1, p < .001). Marital differences among bipolar patients were not significant. A 1-way ANOVA also revealed no significant differences as a function of age.

Hospitalization Variables

Number of previous episodes differed as a function of diagnostic group (F = 12.60, df = 2,204; p < .01). Post hoc analyses revealed that individuals who were diagnosed with either bipolar disorder or schizophrenia had more lifetime admissions than individuals diagnosed with major depression. Possibly attributable to a ceiling effect that is primarily a result of managed care limitations, hospital length of stay did not differ as a function of diagnostic group.

Clinician Ratings

BPRS-A admission ratings also differed as a function of diagnostic group. As indicated in Table 3, patients who were diagnosed with schizophrenia or bipolar disorder had higher scores on both the resistance and positive symptoms scales compared with those individuals diagnosed with major depression. Interestingly, individuals diagnosed with bipolar disorder had the highest BPRS-A total scores, with a statistically significant difference between those patients and individuals with major depression. On the psychological discomfort scale, there was a trend toward patients with major depression being rated as exhibiting more psychological discomfort, although this trend was not statistically significant. Finally, there were

	[1]		[2] Bipolar		[3 Maj] jor	
	Schizophrenia		Disor	Disorder		ssion	Group
Item	Mean	SD	Mean	SD	Mean	SD	Differences
Somatic concern	2.6	1.9	3.1	2.2	2.5	1.5	None
Anxiety	3.3	1.9	3.7	2.0	3.6	1.7	None
Emotional	3.8	2.0	3.0	2.3	2.8	1.9	1 > 3
Conceptual disorganization	4.3	2.0	3.6	2.3	2.2	1.8	1 and $2 > 3$
Guilt feelings	2.0	1.9	2.3	2.2	3.1	1.9	3 > 1
Tension	3.8	1.9	3.8	2.1	3.5	1.8	None
Mannerisms and posturing	2.9	2.1	2.4	2.3	1.6	1.4	1 and $2 > 3$
Grandiosity	2.6	2.1	3.3	2.3	1.6	1.4	1 and $2 > 3$
Depressive mood	2.5	2.0	3.4	2.4	4.8	1.8	3 > 2 > 1
Hostility	3.7	2.2	3.5	2.3	2.4	1.9	1 and $2 > 3$
Suspiciousness	4.3	2.0	3.4	2.3	2.6	1.9	1 > 2 and 3
Hallucinatory behavior	3.8	2.2	3.2	2.3	2.8	2.0	1 > 3
Motor retardation	2.4	2.0	2.5	2.3	2.7	1.7	None
Uncooperativeness	3.7	2.3	3.4	2.3	2.0	1.7	1 and $2 > 3$
Unusual thought content	4.3	2.0	3.8	2.3	2.3	1.9	1 and $2 > 3$
Blunted affect	3.4	2.1	2.8	2.3	3.1	2.0	None
Excitement	3.0	2.2	3.9	2.3	1.8	1.5	2 > 1 > 3
Disorientation	2.3	1.9	2.3	2.3	1.5	1.2	1 and 2 > 3
^a Abbreviation: BPRS-A = Brief Psychiatric Rating Scale-Anchored. Each item is rated on a 7-point scale ranging from 1 ("not present" or "not observed") to 7 ("very severe")							

no significant differences on the negative symptom scale as a function of diagnostic group.

BPRS-A Item Analyses

Individual item analyses were conducted across the BPRS-A items to examine group differences on a more specific level. Results of these analyses are presented in Table 4. As indicated, both schizophrenic and bipolar patients were given higher ratings than patients with major depression on 7 of the 18 BPRS-A items. These items were conceptual disorganization, mannerisms and posturing, grandiosity, hostility, uncooperativeness, unusual thought content, and disorientation. Three items differentiated between schizophrenic and depressed patients. Individuals with schizophrenia were rated as being more withdrawn emotionally and exhibiting more hallucinatory behavior. Conversely, individuals with major depression were rated as expressing more guilt than individuals with schizophrenia. Patients with bipolar disorder did not differ from individuals in the other 2 diagnostic groups on these 3 dimensions. Patients with schizophrenia were assessed as being more suspicious than patients with either bipolar disorder or major depression. Differences among

diagnostic groups were most evident on the depressed mood and excitement items. On the depressed mood dimension, progressively higher depression ratings were given to patients with schizophrenia, bipolar disorder, and major depression, respectively. On the excitement dimension, progressively higher excitement ratings were given to patients with depression, schizophrenia, and bipolar disorder, respectively. Finally, there were no group differences on 5 dimensions: somatic concern, anxiety, tension, motor retardation, and blunted affect.

BPRS-A Change Scores

When BPRS-A admission and discharge scores were examined across the entire sample, the BPRS-A was a useful measure of treatment outcome. Both BPRS-A ratings were collected for 198 of the 207 patients. BPRS-A ratings decreased significantly from admission (mean \pm SD = 56.6 \pm 32.6) to discharge (mean = 28.3 \pm 15.4); (F = 201.25, df = 1,197; p < .001). When difference scores were compared across diagnostic categories, although there were no statistically significant differences among the depressed (mean = 21.8 \pm 17.0), schizophrenic (mean = 29.2 \pm 20.7), and bipolar groups (mean = 33.2 \pm 40.2), these values approached significance (F = 2.69, df = 2,195; p = .07).

Discriminant Function Analyses

The final stage of data analyses involved examining the classificatory power of the 3 sets of predictor variables (i.e., demographics, BPRS-A scale and total scores, and BPRS-A item scores) through several stepwise discriminant function analyses. In the first analysis, demographic and hospitalization characteristics that differentiated among diagnostic groups in univariate analyses were entered (gender, white/not white, single/marital history, number of previous episodes). Number of previous episodes and marital history were retained in the analysis (F = 8.52, df = 4,406; p < .001). Results revealed 56%, 30%, and 52% classification accuracy, respectively, for schizophrenic, bipolar, and depressed groups. Overall, classification accuracy was 46%.

For the BPRS-A data, total admission score was entered first into a discriminant analysis (F = 3.95, df = 2,204; p < .05). This single variable predicted 12%, 25%, and 72% classification accuracy, respectively, for schizo-phrenic, bipolar, and depressed patients. Overall, classification accuracy was 35%. When the 4 factor scales were entered as possible predictors, the resistance, positive symptoms, and psychological discomfort scales were retained in the discriminant function (F = 18.40, df = 6,404; p < .0001). In contrast, neither the BPRS-A total score nor

the negative symptoms scale predicted significant unique variance. Applying the resulting BPRS-A equation, classification accuracy improved to 56%, 57%, and 69%, respectively, for schizophrenic, bipolar, and depressed patients. Overall, classification accuracy was 60%.

When only BPRS-A item scores were entered into a discriminant analysis (F = 13.83, df = 12,398; p < .01), the depressed mood, conceptual disorganization, excitement, emotional withdrawal, guilt feelings, and mannerisms and posturing items were included in the analysis (in descending order of importance). Using this equation, classification accuracy improved to 61%, 60%, and 72%, respectively, for schizophrenic, bipolar, and depressed patients. Overall, classification accuracy was 64%.

A final discriminant function analysis was conducted that included demographic, hospitalization, and BPRS-A variables (i.e., total score, scale score, item score) that had been identified as contributing to outcome prediction in the previous discriminant analyses. Variables retained in this final stepwise analysis, in descending order of importance, were BPRS-A depressed mood item, BPRS-A positive symptoms scale, BPRS-A excitement item, BPRS-A guilt feelings item, BPRS-A mannerisms and posturing item, and number of previous episodes (F = 14.85, df = 12,398; p < .0001). Using this equation, classification accuracy was 68%, 60%, and 74%, respectively, for schizophrenic, bipolar, and depressed patients. Overall, classification accuracy was 67%. These data are presented in Table 5. In order to test the discriminatory power of this classification when compared to chance, we utilized the Press Q statistic suggested by Hair et al.⁴⁰ Using this model, the prediction accuracy of this final discriminant function (67%) is considered statistically significant (Press Q = 106.52, p < .001).

DISCUSSION

The advent of managed care has dramatically altered the provision of inpatient mental health services. Specifically, increased demand for time-limited treatment has accentuated the importance of identifying assessment strategies that are both efficient and precise and that aid in providing brief quality care. In addition to decreased inpatient length of stay, one factor that may negatively affect accurate differential diagnosis (and related treatment planning) is shared symptom presentation across pathologic disorders. To address these issues, it is important to engage in CQI that may improve the efficiency and accuracy of assessment procedures conducted within an inpatient mental health environment. The present study was

Table 5. Accuracy of Diagnostic Group Classification as Determined by Discriminant Function Analysis ^a							
	Classified Diagnosis, N (%)						
Actual DSM-IV Diagnosis	1	2	3				
1. Schizophrenia (N = 75)	51 (68.0)	15 (20.0)	9 (12.0)				
2. Bipolar disorder ($N = 67$)	15 (22.4)	40 (59.7)	12 (17.9)				
3. Major depression $(N = 65)$	5 (7.7)	12 (18.5)	48 (73.8)				
^a Overall, 67.1% of "grouped"	cases were cla	assified corre	ctly.				

designed to examine the utility of the BPRS-A as an instrument that may facilitate the process of differential diagnosis and simultaneously be useful in measuring treatment outcome. To accomplish these objectives, we studied the associations among demographic and hospitalization variables and clinician-based ratings as they relate to differentiating among 3 prominent diagnostic groups. Utilizing 6 predictor variables, discriminant function analysis enabled us to accurately predict patient diagnosis in 67% of patients diagnosed with schizophrenia, bipolar disorder, or major depression.

Based on our analyses, demographic variables such as ethnicity and marital status may provide potentially useful information with regard to predicting diagnostic group membership. Specifically, among patients presenting to an inpatient setting, being single and African American and having never married seem to increase the likelihood that the patient may be diagnosed with schizophrenia. Moreover, female patients that have a marital history appear more likely to be diagnosed with major depression. White individuals appeared more likely to be diagnosed with bipolar disorder. The finding that African Americans are more likely to be diagnosed with schizophrenia has been documented previously.⁴¹ Although the relation between schizophrenia and ethnicity is confounded by socioeconomic status, evidence supporting the notion that being African American per se increases risk for developing schizophrenia remains equivocal.42

The positive relation between being single and receiving a diagnosis of schizophrenia is perceived as a function of the relatedness between schizophrenia and social skill deficits.^{43,44} Consistent with theories regarding the relation between adequate social support and mental health, being married or having a marital history seems to act as a buffer against the need for extended hospitalization.⁴⁵ Among individuals diagnosed with depression, however, an inverse relation was observed; compared with other diagnostic groups, depressed inpatients were more likely to be married or have previously been married. This finding is at least partially attributable to the notion that depression may be a less severe psychiatric condition than either schizophrenia or bipolar disorder. As such, individuals with depression may be less impaired by deficits in social functioning and may be more capable of forming intimate relationships. A second explanation is that being married does not necessarily result in positive affect, as maladaptive relationships may be an important precipitant of depression.⁴⁶ Finally, and perhaps the most parsimonious explanation in the present sample, is the finding that although 54% of the patients with major depression had a marital history, only 14% were married currently. The relationship cessation (i.e., divorce, separation, or being widowed) experienced by the remaining 40% of these patients certainly may have contributed to the onset of their depressive episodes.

The examination of hospitalization variables revealed that patients diagnosed with either schizophrenia or bipolar disorder were more likely to have had a higher frequency of previous inpatient admissions. This finding is probably attributable to the interrelatedness among demographic factors such as lower socioeconomic status and psychiatric factors such as severity of mental illness. Moreover, as indicated in previous research, for a subset of patients admitted to HCPC (i.e., psychotic patients), the brief length of stay mandated by managed care may be insufficient to treat psychiatric illness adequately (D. R. H.; D. Lachar, Ph.D.; S. E. Bailley, Ph.D.; et al., manuscript submitted, 2000). Accordingly, one may speculate that individuals with major depression may be less affected by these limitations than individuals with more severe mental illness. Future research should explore this hypothesis.

More pertinent than either demographic variables or hospitalization variables, BPRS-A clinical rating at admission was supported strongly as a predictor of diagnostic group membership, with bipolar individuals receiving higher BPRS-A total scores. This finding is particularly notable considering the possible utility of incorporating this clinician-rated measure at admission when patient cooperation often is questionable. For example, given the acuity of patients presenting to inpatient mental health facilities and stringent admission criteria (e.g., threat to self or others), clinician ratings may be especially valuable when a patient is admitted and is unable (e.g., is psychotic) or unwilling (e.g., was admitted involuntarily) to communicate psychiatric symptoms. A more significant finding, perhaps, was the added utility of examining BPRS-A ratings within the context of the 4 factor-derived scale dimensions. Specifically, discriminant function analyses indicated that the resistance, positive symptoms, and psychological discomfort scales are more useful than the

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BPRS-A total score in predicting patient diagnosis. Specifically, increased resistance and positive symptoms are useful in distinguishing individuals with schizophrenia and bipolar disorder from patients with major depression. Although this pattern of results elucidates the utility of the BPRS-A as a supplement to more traditional assessment strategies, these summary scores may not adequately suffice in capturing distinctions among diagnostic groups. As presented earlier, the more specific level of individual item analysis allows for a greater level of specificity in describing results. Compared with BPRS-A total and scale scores, item analysis accounted for a greater proportion of variance in predicting diagnostic group.

Overall, the results suggest that the BPRS-A may play a useful role as it relates to COI within inpatient mental health settings. First, the BPRS-A appears to be a useful adjunct to traditional strategies in facilitating accurate differential diagnosis. Second, the BPRS-A is an instrument that appears to be a useful measure of treatment outcome. Third, the cost- and time-efficient nature of the BPRS-A make it a viable option in the era of managed care. Fourth, although further research is necessary to explore the hypothesis, it is conceivable that medical personnel other than attending psychiatrists may be trained to administer the BPRS-A reliably, perhaps increasing the efficiency of diagnostic screening procedures at acute inpatient admission. Although we are not advocating the replacement of more traditional assessment strategies with BPRS-A interpretation, this instrument shows promise as a supplement when overlapping symptoms complicate differential diagnosis. It appears that the BPRS-A items of depressed mood, excitement, guilt feelings, and mannerisms and posturing may be particularly useful in this process. The BPRS-A positive symptoms scale and number of previous episodes also contribute to understanding distinctions among diagnostic groups. The importance of these findings is highlighted on the basis that this knowledge ultimately may serve to facilitate more accurate admission diagnosis, prerelease interventions, and appropriate aftercare services.

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- 2. Type or print the registration information in the spaces provided, and complete the evaluation.
- 3. Send the Registration Form along with a check, money order, or credit card payment in the amount of \$10 to the address or fax number listed on the Registration Form.

1. Which of the following is not a BPRS-A scale?

- a. Resistance
- b. Positive symptoms
- c. Psychosis
- d. Psychological discomfort

2. In the study, males were more likely to be diagnosed with:

- a. Schizophrenia
- b. Bipolar disorder
- c. Major depression
- d. Panic disorder

3. In the study, females were more likely to be diagnosed with:

- a. Schizophrenia
- b. Bipolar disorder
- c. Major depression
- d. Panic disorder

4. White patients were more likely to be diagnosed with:

- a. Schizophrenia
- b. Bipolar disorder
- c. Major depression
- d. Panic disorder

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- 5. African American patients were more likely to be diagnosed with:
 - a. Schizophrenia
 - b. Bipolar disorder
 - c. Major depression
 - d. Hypertension
- 6. According to this study, patients with a diagnosis of _____ had fewer lifetime admissions.
 - a. Bipolar disorder
 - b. Anxiety disorder
 - c. Major depression
 - d. Schizophrenia
- 7. Individuals diagnosed with _____ had the highest BPRS-A total scores.
 - a. Major depression
 - b. Panic disorder
 - c. Schizophrenia
 - d. Bipolar disorder
- 8. On the BPRS-A items, individuals with schizophrenia and bipolar disorder had higher scores than individuals with major depression on all of the following, *except*:
 - a. Disorientation
 - b. Unusual thought content
 - c. Grandiosity
 - d. Blunted affect

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