Racial Disparity in the Pharmacological Management of Schizophrenia

by Julie Kreyenbuhl, Julie M. Zito, Robert W. Buchanan, Karen L. Soeken, and Anthony F. Lehman

Abstract

This study investigated racial differences in the prescription of psychopharmacologic treatments to individuals with schizophrenia. Data were derived from a patient survey and medical record review for 344 persons with schizophrenia recruited from outpatient psychiatric facilities in two States in the Schizophrenia Patient Outcomes Research Team study. African-Americans were three times more likely to receive depot antipsychotic medications (odds ratio [OR]: 2.91; 95% confidence interval [CI]: 1.68-5.01) and 76 percent less likely to receive new-generation antipsychotic medications (OR: 0.24; 95% CI: 0.12-0.46), compared to their Caucasian counterparts. Chlorpromazine-equivalent antipsychotic dosages did not differ significantly between African-American and Caucasian patients. Compared to Caucasians, a larger proportion of African-Americans received antiparkinsonian medications (63% vs. 48%, \( \chi^2 = 7.01; df = 1; p = 0.008 \)), but African-Americans were less than half as likely to receive adjunctive psychopharmacologic treatments (OR: 0.43; 95% CI: 0.27-0.71). Pronounced racial variations in the psychopharmacologic management of schizophrenia in typical clinical practice settings were observed and persisted when analyses were adjusted for selected patient demographic and clinical characteristics. A prospective, longitudinal evaluation is warranted to determine whether the observed patterns of prescribing are associated with poorer therapeutic outcomes in minority patients.

Keywords: Prescribing patterns, antipsychotic medications, schizophrenia, race.


Schizophrenia is an often severe and disabling mental disorder that affects approximately 1 percent of the world’s population. Because schizophrenia is a chronic condition that can lead to significant and enduring impairment, the costs to individuals and society in terms of human suffering, loss of productivity, and economic burden have been substantial (Carpenter and Buchanan 1995). As such, many treatments aimed at reducing symptoms and rehabilitative interventions aimed at minimizing functional impairments have been investigated and used. In terms of symptom reduction, antipsychotic medications and other adjunctive pharmacotherapies (e.g., antidepressants, anxiolytics, mood stabilizers) have become the mainstay of treatment for the disorder.

Very few studies have investigated whether individuals of dissimilar racial or ethnic backgrounds respond differentially to medications prescribed for the treatment of schizophrenia, and the studies’ findings have been mixed. The results of a recent study comparing response to antipsychotic medications among three ethnic groups (black, mixed descent, white) showed significant differences among the groups in reductions in psychotic symptoms (Emsley et al. 2002), but these findings are not supported by earlier reports (Strickland et al. 1991; Lin and Poland 1995; Lin et al. 1995; Frackiewicz et al. 1997). Furthermore, the few studies (Midha et al. 1988a, 1988b) that have compared African-American and Caucasian patients with respect to pharmacokinetic properties of antipsychotic medications have found no differences between the groups. Some evidence does suggest that up to one-third of African-Americans possess genetic polymorphisms of the enzymes that metabolize most psychopharmacologic agents, resulting in slowed metabolism and the likelihood of enhanced adverse drug effects (Lin and Poland 1995; Lin et al. 1995; Frackiewicz et al. 1997), but the clinical significance of these metabolic differences has not been tested empirically.

However, racial disparities in the prescription of psychopharmacologic medications for individuals with schiz-
schizophrenia have been observed. For example, African-American individuals are more likely to be prescribed long-acting injectable formulations of antipsychotic medications (Price et al. 1985; Chen et al. 1991; Glazer et al. 1994; Chung et al. 1995; Citrome et al. 1996; Segal et al. 1996; Walkup et al. 2000; Kuno and Rothbard 2002). Furthermore, a recent analysis of 1995 Medicaid administrative data demonstrated that African-American patients with schizophrenia were less likely to be prescribed the new-generation antipsychotic medications clozapine and risperidone (Kuno and Rothbard 2002). This finding was not explained by selected factors that may influence prescription decisions, including patient demographic characteristics (age, gender, receipt of Supplemental Security Income) and patterns of service use (psychiatric services, substance abuse services, medical services, prior prescription of long-acting injectable antipsychotic medications).

Because all of the patients in this study were continuously enrolled in the Medicaid program, it is also unlikely that disparities in socioeconomic status or insurance coverage could explain the prescription patterns. These observations are supported by a study in 13 Department of Veterans Affairs (VA) medical centers in which Caucasian veterans with schizophrenia were more likely than those of other racial backgrounds to be prescribed risperidone or olanzapine (Owen et al. 2001). The findings from this study could not be explained by differences in the racial groups in terms of age, gender, marital status, or VA facility where treatment was received. Several studies have also shown that African-American persons with schizophrenia are often prescribed higher antipsychotic dosages relative to Caucasians (Glazer et al. 1994; Chung et al. 1995; Segal et al. 1996; Walkup et al. 2000; Valenstein et al. 2001). In addition, Glazer et al. (1994) observed that African-American outpatients were less likely than Caucasian outpatients to receive adjunctive psychopharmacologic treatments (lithium, antianxiety medications, antidepressants), but the generalizability of these findings from a single treatment setting is largely unknown.

Although a few previous reports have accounted for demographic factors other than race and service use characteristics that may influence prescription decisions, most reports have not investigated the influence of other factors, including psychiatric symptoms, medication side effects, and substance abuse. Therefore, a study was undertaken to overcome these limitations and to further examine the extent of racial differences in the prescription of antipsychotic medications, as well as adjunctive psychotherapeutic medications, among a sample of patients with schizophrenia receiving care in typical outpatient psychiatric treatment settings in two States between 1994 and 1996. We hypothesized that a larger proportion of African-American individuals would be prescribed depot antipsychotic agents, higher antipsychotic medication dosages, and fewer adjunctive medications, relative to Caucasians. We further hypothesized that a smaller proportion of African-Americans than Caucasians would be prescribed new-generation antipsychotic medications.

### Research Methods

#### Overview and Sampling.

The Schizophrenia Patient Outcomes Research Team (PORT) study was initiated to evaluate variations in treatment patterns for persons with schizophrenia and the implications of these variations. To investigate these patterns, a cross-sectional patient survey of individuals with schizophrenia receiving care in a midwestern State and a southern State was conducted. The sampling strategy for this survey is described in detail elsewhere (Lehman et al. 1998). In brief, inpatient and outpatient treatment facilities in urban and rural locales within the States were randomly selected and recruited for participation in the PORT study. Within each provider organization, patients who met eligibility criteria were randomly selected from treatment rosters to be interviewed. To be eligible, participants had to have a current diagnosis of schizophrenia or schizoaffective disorder, be English speaking, be at least 18 years of age, be legally competent, and live within the community sampled. After receiving a complete description of the study, all subjects provided written informed consent to be interviewed and permit a review of their medical records.

The data for the present study were derived from subjects recruited from outpatient treatment facilities only. A total of 1,017 outpatients met the initial eligibility criteria for participation in the PORT study, and 584 (57%) agreed to have their names released to the study. Thirty-four of these patients were subsequently deemed ineligible for the interview (20 were considered incapable, 6 resided outside of the geographic area, and 8 died prior to recruitment). Exactly 550 potential subjects remained, and 440 (43% of 1,017) completed the interview. Of the 110 that did not complete the interview, 78 individuals refused, 18 could not be located, and 14 were not interviewed for miscellaneous other reasons. All patient interviews were conducted between December 1994 and March 1996.

#### Inclusion/Exclusion Criteria.

The data for this study are a subset of the original outpatient sampling frame from the PORT study. Because pharmacological treatments for older persons with schizophrenia are likely to vary from those of the average patient, persons greater than 64 years of age (n = 34) were excluded. Also, patients without a confirmed diagnosis of schizophrenia or schizoaffective disorder in the medical record (n = 27) were not included. Individuals with racial or ethnic backgrounds other than African-American or Caucasian were excluded (n = 17), and an additional 18 persons with invalid medication data.
were also not included. Thus, 78 percent (n = 344) of the 440 individuals who were receiving treatment in outpatient facilities and who completed the PORT Mental Health Survey were included in the present study.

Data Collection Instruments. The PORT Mental Health Survey was administered during a 90-minute face-to-face interview. The survey instrument consisted of 11 sections, including demographics, social and family relationships, living arrangements, daily activities and functioning, employment, financial resources, legal issues, health status, service use, patient knowledge, and life satisfaction. The current medical records of survey respondents were also reviewed to supplement the survey information. Abstracted information included the patient's psychiatric and medical histories, health services utilization, treatment plan, medications, and family contacts and services.

Measures. African-American and Caucasian subjects were compared in terms of demographic and clinical characteristics, psychiatric symptoms and medication side effects, functioning and satisfaction, and selected medication prescribing patterns. The demographic characteristics examined were age, gender, years of education, marital status, State of residence, locale of residence (rural vs. urban), and type of treatment facility (public vs. private). Preliminary analyses revealed that the vast majority of all patients received care from public facilities. Therefore, this factor was retained for descriptive purposes only, given the potential for small cell sizes in multivariate analyses.

Among the clinical characteristics, each subject's diagnosis (schizophrenia vs. schizoaffective disorder) was ascertained from the medical record abstraction. The number of years with a diagnosis of schizophrenia was calculated by subtracting the self-reported age at first visit with a mental health professional from the patient's age at survey interview. Recent psychiatric hospitalization was characterized as a dichotomous variable indicating whether a person did or did not have a psychiatric hospitalization in the past year, as documented in the medical record. An individual was classified as having a current substance abuse problem if he or she met one or more criteria for current alcohol abuse or current drug abuse. The criteria for current alcohol abuse were (1) self-reported participation in a methadone maintenance program; (2) documentation of two or more of the following additional indicators of current drug abuse: self-reported use of illicit drugs at least once in the past month; a score of greater than 2 on the Drug CAGE scale (Ewing 1984; Midanik et al. 1998); self-reported attendance at Narcotics Anonymous meetings in the past year; or documentation of drug abuse counseling in the medical record. An individual was classified as having a medical comorbidity based on self-reported current diagnosis of hypertension, a heart condition, or a seizure disorder. These medical conditions were chosen because of the potential for adverse drug-disease interactions.

In terms of symptoms, a modification of the psychotism subscale of the Symptom Checklist-90 (SCL-90), Revised Version (Derogatis et al. 1973) was used as a measure of self-reported psychotic symptoms. A study evaluating the construct validity of the various dimensions of the SCL-90 revealed problems with the items of the psychotism construct (Derogatis and Cleary 1977). Thus, only four items from this construct (the idea that someone else can control your thoughts; hearing voices that other people do not hear; other people being aware of your private thoughts; having thoughts that are not your own), along with two items from the paranoid ideation construct (feeling that most people cannot be trusted; feeling that you are watched or talked about by others), were chosen for the modified psychotism scale. In addition, the depression subscale of the SCL-90 was used as a measure of self-reported depressive symptoms; no modifications were made to this 13-item scale. For both scales, a higher score represented a higher level of symptoms. Cronbach's alpha (Carmines and Zeller 1979) was calculated to assess the internal consistency of these scales for the study sample. Cronbach's alpha exceeded 0.80 for both scales. In terms of medication side effects, subjects reported the frequency of eight different symptoms (i.e., drowsiness, restlessness, sluggishness, shaking, blurred vision or dry mouth, interference with concentration or memory, sexual dysfunction, weight gain). The frequency of each symptom was rated on a 3-point scale ranging from "none of the time" to "most of the time," and an overall score was calculated as the mean response per item answered. A higher score represented a greater burden of medication side effects.

Within the patient survey, measures of social functioning and general life satisfaction derived from Lehman's Quality of Life Interview (Lehman 1983) were utilized. For both scales, a higher score represented a higher level of functioning or satisfaction. Cronbach's alpha exceeded 0.70 for both scales. Employment status (employed vs. not employed) was characterized based upon patient self-report. Satisfaction with medications was assessed by responses to two interview questions: (1) "Overall, how much do you think your medication has..."
helped you?” (2) “How much does your medication prevent you from getting sick?” Responses to both questions were rated on a three-point scale ranging from “not at all” to “a lot,” and an overall score was calculated as the mean response per item answered. A higher score represented increased satisfaction with medications.

Information on all psychotropic medications prescribed for each subject was obtained from the medical record. Each of the pharmacotherapy variables was operationally defined by examining medications prescribed on a scheduled basis; medications to be administered on an “as needed” basis were excluded. Seven African-American individuals (5%) and five Caucasian patients (2%) did not receive antipsychotic medications and were not included in the antipsychotic medication analyses.

The type of antipsychotic medication prescribed was dichotomized as use of “only conventional” versus “any new-generation” antipsychotic medications. Conventional antipsychotics prescribed during the PORT study included chlorpromazine, fluphenazine, haloperidol, loxapine, mesoridazine, molindone, perphenazine, thioridazine, thiothixene, and trifluoperazine. New-generation antipsychotic medications prescribed during the PORT study included clozapine and risperidone. If a subject was prescribed both a conventional and a new-generation antipsychotic medication, he or she was classified in the “any new-generation” category.

The route of administration of the antipsychotic medication was dichotomized as use of “only oral” versus “any depot” (long-acting injectable) antipsychotic formulation. The agents available as depot formulations are fluphenazine and haloperidol decanoate, which are also available as oral agents. A person who received both an oral and a depot antipsychotic medication was classified in the “any depot” category.

The average daily dose (ADD) of the antipsychotic medication was calculated by multiplying the strength of the medication by the number of daily doses of the drug. To allow for comparisons of dosages among antipsychotic medications, a patient’s ADD was converted to chlorpromazine equivalents (CPZ-EQ), or the approximate dose equivalent based on a standard dose of 100 mg of chlorpromazine (Zito 1994). The doses of clozapine and risperidone equivalent to 100 mg of chlorpromazine were 50 mg and 1 mg, respectively, and were estimated from the dosages used in the clinical trials demonstrating efficacy in positive symptom reduction (Kane et al. 1988; Marder and Meibach 1994). If a person received a depot antipsychotic medication, the following conversion rules were used: (1) 25 mg of fluphenazine decanoate administered every 3 weeks is equivalent to 665 CPZ-EQ mg per day; and (2) 50 mg of haloperidol decanoate administered every 4 weeks is equivalent to 5 mg of oral haloperidol per day. The fluphenazine decanoate conversion was developed by consensus of the New York State Office of Mental Health Committee on Psychotherapeutics upon review of the available literature. The clinical experience reported to the Committee did not agree with the limited information that was used to create an earlier oral-depot conversion (Schoeller and Levine 1976). Consequently, a conversion reflecting practice experience proposed by Kane was adopted (Zito 1994). The haloperidol decanoate conversion was taken from the manufacturer’s recommendation of a decanoate dosage that is 10 to 20 times the daily dose of oral haloperidol (Haldol Decanoate 2001). If a subject received more than one antipsychotic medication in terms of type or route of administration, the CPZ-EQ doses per antipsychotic were summed.

The use of adjunctive psychopharmacologic medications was also examined. The following medications within each class were prescribed in the PORT study: (1) antidepressants: amitriptyline, amoxapine, buproprion, clomipramine, desipramine, doxepin, fluoxetine, fluvoxamine, imipramine, maprotiline, nortriptyline, paroxetin, sertraline, trazodone, and venlafaxine; (2) anxiolytic/hypnotics: alprazolam, buspiron, chloral hydrate, clonazepam, clorazepate, diazepam, flurazepam, hydroxyzine, lorazepam, oxazepam, and temazepam; and (3) mood stabilizers: carbamazepine, lithium, and valproate. Adjunctive psychotherapeutic medications were dichotomized as use of one or more adjunctive medications versus no use of adjunctive medications. The extent of use of antiparkinsonian medications (amantadine, benztropine, diphenhydramine, trihexyphenidyl) for the prevention or treatment of the extrapyramidal side effects of antipsychotic medications was also described and compared between the study groups.

Analytic Plan. Univariate statistics were used to evaluate the differences between the African-American and Caucasian subjects in terms of demographic and clinical characteristics. For categorical variables, chi-square analyses were used to evaluate differences among proportions; if the expected cell counts were less than five in more than 20 percent of the cells, Fisher’s exact test was used. For continuous variables, Student’s t tests were used to compare mean differences. In the case of heterogeneity of variances with unequal group sizes, a correction was applied. Age, gender, and additional demographic and clinical characteristics found to differ significantly at alpha < 0.05 between the African-American and Caucasian subjects in univariate analyses were included as covariates in subsequent multivariate regression models.

Multiple logistic regression analyses, adjusted for covariates, were used to evaluate the relationships between race and patterns of pharmacotherapy operationalized as binary outcome measures (e.g., type of antipsychotic medication). Adjusted odds ratios for each
predictor variable and a 95 percent confidence interval were estimated from \( \exp(b) \) and \( \exp(b \pm 1.96 \text{ standard error } [b] ) \), where \( b \) is the estimated logistic regression coefficient for the given predictor. In addition, multiple linear regression analysis, adjusted for covariates, was used to evaluate the relationship between race and antipsychotic ADD, a continuous outcome measure. None of the two-way interactions between race and each covariate were found to be significant in preliminary univariate analyses, and therefore they were not included in the final regression models. All statistical tests were 2-tailed, and the level of significance was defined as 0.05.

### Results

In Table 1, the African-American and Caucasian patients are compared in terms of selected demographic and clinical characteristics. With respect to demographic factors, the African-American individuals were older than the Caucasian patients \( (t = 2.17; df = 342; p = 0.03) \). In addition, relative to Caucasian individuals, a smaller proportion of the African-American patients were sampled from State A \( (63\% \text{ vs. } 51\%; \chi^2 = 4.93; df = 1; p = 0.03) \) and a larger proportion of African-American patients were receiving care within a public psychiatric facility \( (85\% \text{ vs. } 94\%; \chi^2 = 6.29; df = 1; p = 0.01) \).
In terms of clinical characteristics, a smaller proportion of African-Americans were diagnosed with schizoaffective disorder as opposed to schizophrenia, compared to Caucasians (16% vs. 27%; $\chi^2 = 5.69; df = 1; p = 0.01$). In addition, a significantly larger proportion of African-Americans reported a current diagnosis of high blood pressure, a heart condition, or a seizure disorder, relative to Caucasians (30% vs. 16%; $\chi^2 = 9.04; df = 1; p = 0.003$). The African-American and Caucasian samples were similar in terms of psychiatric symptomatology and medication side effects, social and occupational functioning, and quality of life/satisfaction (table 1).

Several differences were observed between the study groups with respect to patterns of pharmacological treatment for schizophrenia. A larger proportion of African-American patients received depot injection antipsychotic medications relative to Caucasian patients (40% vs. 18%; $\chi^2 = 20.71; df = 1; p = 0.001$). Specifically, African-American individuals were three times more likely to receive a depot antipsychotic medication than Caucasians (odds ratio [OR]: 2.91; 95% confidence interval [CI]: 1.68–5.01). The relationship persisted when the analysis was adjusted for demographic and clinical covariates (table 2). Of note, similar proportions of African-American and Caucasian patients who received depot antipsychotic medications received an oral antipsychotic medication concurrently (31% and 36%, respectively). In addition, subjects residing in State A and those with one or more medical comorbidities were more likely to receive depot medications, relative to subjects from State B and those without comorbid medical conditions, respectively (table 2).

Conversely, a smaller proportion of African-American patients were prescribed new-generation antipsychotic medications compared to their Caucasian counterparts (14% vs. 37%; $\chi^2 = 20.26; df = 1; p = 0.001$). This observation is accounted for in large part by the 6-fold difference in the prescription of clozapine between the African-Americans and Caucasians (3% vs. 19%; $\chi^2 = 17.53; df = 1; p = 0.001$); the rate of prescription of risperidone did not differ significantly between the two groups (11% vs. 18%; $\chi^2 = 3.35; df = 1; p = 0.067$). As shown in table 3, logistic regression analysis revealed that African-American individuals were 76 percent less likely to receive a new-generation antipsychotic medication compared to Caucasians, when age, gender, education, State of residence, diagnosis, and medical comorbidity were controlled (OR: 0.24; 95% CI: 0.12–0.46). Among the subjects who received new-generation agents, 22 percent of both study groups received an additional antipsychotic medication concomitantly. The multivariate analysis also demonstrated that older subjects and those from State A were less likely to receive newer antipsychotic medications, relative to younger subjects and those residing in State B, respectively (table 3).

Overall, the antipsychotic dosages prescribed to the African-American (mean: 765 ± 652 CPZ-EQ; median: 565 CPZ-EQ) and Caucasian (mean: 711 ± 695 CPZ-EQ; median: 550 CPZ-EQ) individuals were statistically similar in bivariate analyses ($t = 1.33; df = 330; p = 0.08$). Because the antipsychotic ADD was not normally distributed, a logarithmic transformation was applied; it improved but did not completely remove the significant positive skew in multivariate analyses. Race was not cor-

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**Table 2. The likelihood of prescription of depot antipsychotic medication to African-American outpatients with schizophrenia**

<table>
<thead>
<tr>
<th>Parameter estimate</th>
<th>Odds ratio</th>
<th>95% confidence interval</th>
<th>Wald $\chi^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>African-American$^1$</td>
<td>1.07</td>
<td>2.91</td>
<td>1.68–5.01</td>
<td>14.71</td>
</tr>
<tr>
<td>Covariates</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age 18–34 yrs$^2$</td>
<td>-0.39</td>
<td>0.66</td>
<td>0.26–1.64</td>
<td>0.81</td>
</tr>
<tr>
<td>Age 35–49 yrs$^2$</td>
<td>0.29</td>
<td>1.29</td>
<td>0.70–2.38</td>
<td>0.67</td>
</tr>
<tr>
<td>Male</td>
<td>-0.15</td>
<td>0.85</td>
<td>0.49–1.48</td>
<td>0.32</td>
</tr>
<tr>
<td>Education ≥ 12 yrs$^3$</td>
<td>-0.22</td>
<td>0.80</td>
<td>0.46–1.39</td>
<td>0.62</td>
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<tr>
<td>State A$^4$</td>
<td>0.73</td>
<td>2.07</td>
<td>1.17–3.65</td>
<td>6.23</td>
</tr>
<tr>
<td>Schizophrenia$^5$</td>
<td>0.23</td>
<td>1.27</td>
<td>0.64–2.49</td>
<td>0.47</td>
</tr>
<tr>
<td>Medical comorbidity</td>
<td>0.69</td>
<td>1.97</td>
<td>1.09–3.59</td>
<td>4.92</td>
</tr>
</tbody>
</table>

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$^1$ Reference group: Caucasian.
$^2$ Reference group: age 50–64 years.
$^3$ Reference group: education < 12 yrs.
$^4$ Reference group: State B.
$^5$ Reference group: schizoaffective disorder.
Table 3. The likelihood of prescription of new-generation antipsychotic medication to African-American outpatients with schizophrenia

<table>
<thead>
<tr>
<th>Covariates</th>
<th>Parameter estimate</th>
<th>Odds ratio</th>
<th>95% confidence interval</th>
<th>Wald ( \chi^2 )</th>
<th>( p )</th>
</tr>
</thead>
<tbody>
<tr>
<td>African-American(^1)</td>
<td>-1.44</td>
<td>0.24</td>
<td>0.12–0.46</td>
<td>18.49</td>
<td>0.0001</td>
</tr>
<tr>
<td>Age 18–34 yrs(^2)</td>
<td>2.06</td>
<td>7.81</td>
<td>3.27–18.69</td>
<td>21.33</td>
<td>0.0001</td>
</tr>
<tr>
<td>Age 35–49 yrs(^2)</td>
<td>0.80</td>
<td>2.23</td>
<td>1.04–4.77</td>
<td>4.27</td>
<td>0.04</td>
</tr>
<tr>
<td>Male</td>
<td>-0.17</td>
<td>0.85</td>
<td>0.47–1.52</td>
<td>0.32</td>
<td>0.57</td>
</tr>
<tr>
<td>Education ≥ 12 yrs(^3)</td>
<td>0.02</td>
<td>1.02</td>
<td>0.55–1.87</td>
<td>0.004</td>
<td>0.95</td>
</tr>
<tr>
<td>State A(^4)</td>
<td>-0.97</td>
<td>0.38</td>
<td>0.22–0.66</td>
<td>11.62</td>
<td>0.0007</td>
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<tr>
<td>Schizophrenia(^5)</td>
<td>0.49</td>
<td>1.63</td>
<td>0.82–3.23</td>
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<td>0.16</td>
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<td>Medical comorbidity</td>
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<td>0.78</td>
<td>0.37–1.66</td>
<td>0.41</td>
<td>0.52</td>
</tr>
</tbody>
</table>

\(^1\) Reference group: Caucasian.  
\(^2\) Reference group: age 50–64 years.  
\(^3\) Reference group: education < 12 yrs.  
\(^4\) Reference group: State B.  
\(^5\) Reference group: schizoaffective disorder.

related with antipsychotic dosage in any of the multivariate analyses where demographic and clinical covariates were controlled (data not shown). When the analyses were restricted to those patients who received depot antipsychotic agents, no significant differences in dosages were observed between the African-American (mean: 1,131 ± 773 CPZ-EQ; median: 1,000 CPZ-EQ) and Caucasian (mean: 1,471 ± 1,047 CPZ-EQ; median: 1,000 CPZ-EQ) patients in bivariate \((t = 1.83; df = 85; p = 0.05)\) or multivariate analyses (data not shown). Similarly, no differences were observed when the analyses were restricted to persons who received only oral antipsychotic medications (African-American: mean: 519 ± 404 CPZ-EQ; median: 400 CPZ-EQ; Caucasian: mean: 549 ± 456 CPZ-EQ; median: 400 CPZ-EQ) \((t = 1.27; df = 243; p = 0.24)\).

However, a larger proportion of African-American patients (63%) received antiparkinsonian medications in comparison to Caucasians (48%) \((\chi^2 = 7.01; df = 1; p = 0.008)\).

In terms of adjunctive psychopharmacologic treatments, a smaller proportion of African-American individuals received one or more adjunctive medications relative to their Caucasian counterparts (38% vs. 57%) \((\chi^2 = 11.92; df = 1; p = 0.001)\). The proportions of African-American and Caucasian individuals who received each class of adjunctive medication were as follows: antidepressants (25% vs. 35%, respectively), anxiolytics (8% vs. 21%, respectively), and mood stabilizers (13% vs. 23%, respectively). As presented in table 4, multivariate analyses demonstrated that African-American patients were 57 percent less likely to receive adjunctive medications compared to Caucasian patients \((OR: 0.43; 95\% CI: 0.27–0.71)\). In addition, persons from State A and those diagnosed with schizophrenia were less likely to be prescribed adjunctive medications, relative to those from State B or those diagnosed with schizoaffective disorder, respectively (table 4).

**Discussion**

Pronounced variations by race in the psychopharmacologic management of schizophrenia in typical clinical practice were observed. African-Americans were more likely than Caucasians to receive depot antipsychotic medications, which is consistent with our hypothesis as well as other study findings (Price et al. 1985; Chen et al. 1991; Glazer et al. 1994; Chung et al. 1995; Citrome et al. 1996; Segal et al. 1996; Walkup et al. 2000; Kuno and Rothbard 2002). This observation was paralleled by our finding that African-American individuals were less likely to receive new-generation antipsychotic medications, which supports the results of a study of Medicaid recipients conducted during a similar time period as the present study (Kuno and Rothbard 2002) as well as a more recent study of veterans with schizophrenia (Owen et al. 2001). Various interrelated patient, provider, and administrative factors may explain these findings. In general, access to the new-generation medications is prohibitively expensive; the Medicaid program in State B operated a prior authorization program for both clozapine and risperidone during the study period. Moreover, overall budgetary constraints within the public mental health systems in both States may have limited the prescription of new-generation agents in...
Table 4. The likelihood of prescription of adjunctive psychopharmacologic medications to African-American outpatients with schizophrenia

<table>
<thead>
<tr>
<th>Parameter estimate</th>
<th>Odds ratio</th>
<th>95% confidence interval</th>
<th>Wald $\chi^2$</th>
<th>p</th>
</tr>
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<tbody>
<tr>
<td>African-American$^1$</td>
<td>-0.83</td>
<td>0.43</td>
<td>0.27–0.71</td>
<td>11.10</td>
</tr>
<tr>
<td>Covariates</td>
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</tr>
<tr>
<td>Age 18–34 yrs$^2$</td>
<td>-0.48</td>
<td>0.62</td>
<td>0.30–1.26</td>
<td>1.75</td>
</tr>
<tr>
<td>Age 35–49 yrs$^2$</td>
<td>-0.15</td>
<td>0.87</td>
<td>0.50–1.51</td>
<td>0.26</td>
</tr>
<tr>
<td>Male</td>
<td>-0.27</td>
<td>0.76</td>
<td>0.47–1.24</td>
<td>1.22</td>
</tr>
<tr>
<td>Education ≥ 12 yrs$^3$</td>
<td>0.21</td>
<td>1.23</td>
<td>0.75–2.03</td>
<td>0.66</td>
</tr>
<tr>
<td>State A$^4$</td>
<td>-0.56</td>
<td>0.57</td>
<td>0.35–0.92</td>
<td>5.33</td>
</tr>
<tr>
<td>Schizophrenia$^5$</td>
<td>-1.35</td>
<td>0.26</td>
<td>0.14–0.47</td>
<td>20.03</td>
</tr>
<tr>
<td>Medical comorbidity</td>
<td>0.21</td>
<td>1.23</td>
<td>0.69–2.19</td>
<td>0.51</td>
</tr>
</tbody>
</table>

$^1$ Reference group: Caucasian.

$^2$ Reference group: age 50–64 years.

$^3$ Reference group: education < 12 yrs.

$^4$ Reference group: State B.

$^5$ Reference group: schizoaffective disorder.

all State-funded facilities. However, the associations between race and prescribing practices persisted despite the inclusion of State of residence in the multivariate models, suggesting that prescribing restrictions and other administrative factors did not contribute to the observed racial differences in treatment. Furthermore, the observed prescribing differences remained after adjusting for other confounding factors such as age, gender, years of education (a proxy for socioeconomic status), diagnosis, and medical comorbidity.

In addition, other unmeasured variables, such as cultural factors, may have contributed to the study findings (Smith et al. 1993). For example, it has been shown that ethnic and racial minorities are more hesitant to seek treatment in the standard mental health system (Adebimpe 1994; Lawson 1996). A fear of psychiatric treatment and hospitalization may contribute to the real or perceived notion that African-Americans are less likely to adhere to medications, including the hematologic monitoring requirements associated with clozapine. In addition, a benign leukopenia reportedly exhibited by African-Americans may further contribute to clinicians' hesitancy to prescribe clozapine in this population (Lawson 1996). These factors may explain the increased prescription of depot antipsychotic medications relative to the use of the new-generation agents, particularly clozapine, among African-Americans in this study. Furthermore, a reluctance to seek early treatment could result in presentation of more severe symptomatology. This observation, coupled with racial differences in the presentation of psychiatric symptoms, could significantly influence prescription treatment decisions (Lawson 1996).

The racial differences in presentation and interpretation of psychiatric symptomatology may also explain the reduced prescribing of adjunctive pharmacotherapies to African-Americans in this study. We observed that fewer African-Americans were diagnosed with schizoaffective disorder relative to Caucasians in this study. However, the relationship between race and the use of adjunctive medications persisted despite the inclusion of this variable in multivariate models. Whether psychiatric symptoms were misinterpreted or African-American patients did not present to the physician with ancillary symptoms of anxiety, depression, or mania so as to warrant adjunctive treatment is not known, but the possibility of undertreatment of these symptoms merits further attention (Delahanty et al. 2001; Dixon et al. 2001). However, the cross-sectional study design precludes drawing firm conclusions. A prospective evaluation of treatment and outcomes in the usual practice setting would provide the more detailed symptom data necessary to determine whether minority patients are undertreated for ancillary symptoms.

The results of this study did not support our hypothesis that African-American individuals would be prescribed higher antipsychotic medication dosages than Caucasians. Several factors may explain why our observations were not consistent with previous reports (Glazer et al. 1994; Chung et al. 1995; Segal et al. 1996; Walkup et al. 2000; Valenstein et al. 2001). Three of these studies (Chung et al. 1995; Segal et al. 1996; Walkup et al. 2000) were conducted in inpatient or psychiatric emergency room settings, where patients were possibly exhibiting acute symptom exacerbations. Valenstein et al.'s (2001) report included individuals hospitalized for at least 150 days or with five or more admissions in the past year, suggesting that the individuals under study were severely symptomatic. The subjects included in the present study were out-

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1 Reference group: Caucasian.

2 Reference group: age 50–64 years.

3 Reference group: education < 12 yrs.

4 Reference group: State B.

5 Reference group: schizoaffective disorder.
patients and were likely to be less acutely symptomatic and prescribed lower antipsychotic dosages, in general. The sampling frame for the PORT study included outpatient treatment facilities in both urban and rural locales within two geographically diverse States. As such, subjects in this study were probably more representative of clinical practice in typical outpatient settings, relative to individuals included in previous reports where antipsychotic dosage disparities by race were observed. Furthermore, in two previous reports (Glazer et al. 1994; Walkup et al. 2000), the authors concluded that racial differences in antipsychotic dosing resulted from the disproportionate use of depot agents (at high doses) in African-American individuals. Although we did observe a higher rate of depot antipsychotic prescription in African-American individuals, we also observed similar rates of prescription of an additional oral antipsychotic medication along with a depot agent in both groups, which may partly explain why overall CPZ-EQ antipsychotic doses were similar.

Although antipsychotic dosages did not differ appreciably between the study groups, the fact that a larger proportion of African-Americans received antiparkinsonian medications for extrapyramidal side effects warrants attention. The side effect burden imposed by conventional depot antipsychotic medications is likely to be greater than that associated with other treatment options, particularly new-generation antipsychotic medications. Although African-American patients did not report a greater number of medication side effects relative to Caucasians in this study, the fact that African-Americans received greater exposure to antipsychotic medications because of use of the depot formulations could have significant implications in terms of long-term adverse effects such as tardive dyskinesia. Although empirical evidence that depot administration increases the risk of tardive dyskinesia is still lacking (APA 1992), the disorder has been associated with the overall extent of conventional antipsychotic drug exposure (Kane 1985).

Among the limitations of the study, the cross-sectional design precluded an evaluation of the implications of the observed prescribing practices on short- and long-term outcomes of treatment. In addition, this study was conducted prior to the availability of four new-generation antipsychotic medications (aripiprazole, olanzapine, quetiapine, ziprasidone). However, these data provide a snapshot of prescribing practices at a time when the new-generation antipsychotic medications were relatively new to clinical practice and systems of care were implementing policies to address the budgetary concerns imposed by these agents. These data can serve as a useful comparison to studies conducted after 1996, when use of the new-generation agents became much more widespread. Also, given the recent concerns about some of the adverse effects (e.g., weight gain, diabetes) associated with a few of the new-generation agents (Koro et al. 2002), data on the use of conventional antipsychotic medications may be particularly relevant to those patients who may not be suitable candidates for the new-generation antipsychotic medications. Nevertheless, replication of the results of this study is warranted using current data.

Differences by race in patterns of treatment and outcomes have been observed in several other areas of health care (Ayanian et al. 1999; Scirica et al. 1999; Ibrahim et al. 2000). These observations have led to government efforts (e.g., the President’s Initiative on Race and Health) to eliminate the disparities in health status associated with racial and ethnic populations. The Surgeon General’s Report on Mental Health echoes this sentiment in its effort to improve mental health treatments and services for a diverse U.S. population (U.S. Department of Health and Human Services 1999). The results of this study may help to inform such initiatives in order to improve treatment practices and outcomes for all individuals with severe mental illness.

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Minority Research Training in Psychiatry

Through a five-year, $2.5 million grant from the National Institute of Mental Health, the American Psychiatric Institute for Research and Education (APIRE) is seeking through the Program for Minority Research Training in Psychiatry (PMRTP) to increase the number of minority psychiatrists entering the field of psychiatric research.

The program provides medical students with funding for stipends, travel expenses, and tuition for an elective or summer experience in a research environment, with special attention paid to trainees’ career development in research. In addition, stipends are available for a limited number of one- or two-year postresidency fellowships for minority psychiatrists. Residents may engage in full-year research training during the last year of psychiatric residency or in “year off” research training.

Training takes place at research-oriented departments of psychiatry in major U.S. medical schools and other appropriate sites throughout the country. An individual at the site (the research “mentor”) is responsible for overseeing the research training experience.

Administered by the American Psychiatric Institute for Research and Education, the program includes outreach efforts to identify minority medical students and residents who are potential researchers and to put them in touch with advisors who counsel them about careers in psychiatric research. Additional activities assist fellows and alumni in their research career development.

The director of the PMRTP is James Thompson, M.D., M.P.H.; the project manager is Ernesto Guerra. An advisory committee of senior researchers and minority psychiatrists developed guidelines for applicants and criteria for selection. The members of this committee evaluate and select trainees, oversee the research training experiences, and play a role in evaluating the effectiveness of the program.

December 1 is the deadline for applications for residents seeking a year or more of training and for postresidency fellows. For medical students, applications are due three months before training is to begin. Summer medical students who will start their training by June 30 should submit their applications by April 1.

For more information about the PMRTP, call the toll-free number for the PMRTP, 1-800-852-1390, or 202-682-6225, e-mail eguerra@psych.org, or write to PMRTP at the American Psychiatric Institute for Research and Education, 1400 K Street, NW, Washington, DC 20005.