

# Measuring the Quality of Outpatient Treatment for Schizophrenia

Alexander S. Young, MD, MSHS; Greer Sullivan, MD, MSPH; M. Audrey Burnam, PhD; Robert H. Brook, MD, ScD

**Background:** Consumers and policy makers are increasingly interested in measuring treatment quality. We developed a standardized approach to measuring the quality of outpatient care for schizophrenia and used it to evaluate routine care.

**Methods:** We randomly sampled 224 patients in treatment for schizophrenia at 2 public mental health clinics. Appropriate medication management was defined according to criteria derived from national treatment recommendations, and focused on recent management of symptoms and side effects. Adequate psychosocial care was defined as the recent provision of case management or family management to patients for whom it is indicated. Care was evaluated using patient interviews and medical records abstractions.

**Results:** Although patients at the 2 clinics had similar illnesses, the treatment they received was quite different. In total, 84 (38%) of patients received poor-quality medica-

tion management, and 117 (52%) had inadequate psychosocial care. Clinics differed in the proportion of patients receiving poor-quality medication management not attributable to patient factors (28% vs 16%). The clinic with better-quality medication management provided case management to fewer severely ill patients (48% vs 81%). More than half of the cases of poor care would not have been detected if we had used only medical records data.

**Conclusions:** At these clinics, many schizophrenic patients were receiving poor-quality care and most poor care was likely due to factors that can be modified. One approach to improving care begins by developing systems that monitor quality. These systems may require improved medical records and patient-reported symptoms and side effects.

*Arch Gen Psychiatry.* 1998;55:611-617

From the Department of Psychiatry and Center for Health Services, University of California Los Angeles (Drs Young and Brook); the West Los Angeles Veterans Affairs Medical Center (Dr Young), Los Angeles; the Little Rock Veterans Affairs Medical Center and the University of Arkansas for Medical Science, Little Rock (Dr Sullivan); and the Health Program, RAND Corporation, Santa Monica, Calif (Drs Young, Sullivan, Burnam, and Brook).

**A**GENCIES THAT fund public mental health care are currently implementing management strategies that, while designed to improve access and efficiency, could have powerful unanticipated effects on the quality of care.<sup>1</sup> Fiscal technologies developed to manage behavioral health benefits of private corporations are being applied to public systems that care for severe, chronic disorders such as schizophrenia. Concerns that severely ill individuals may be at increased risk for poor outcomes under these new financing systems<sup>2-4</sup> have led public agencies to increase their oversight functions.<sup>5</sup> However, surprisingly little is known about how to monitor quality of care for schizophrenia,<sup>6</sup> or what “benchmarks” of quality exist in treatment organizations.<sup>7,8</sup> If we are to evaluate the impact of managed care or quality improvement efforts on severely ill populations, then

we need quality evaluation methods that can be broadly implemented in public settings.<sup>9</sup>

Fortunately, clinical research in schizophrenia has facilitated the development of practice guidelines and national recommendations for care.<sup>10-12</sup> A review of the literature regarding treatment of schizophrenia reveals strong evidence for the efficacy of medication management, clinical case management, and family management.<sup>13</sup> Appropriate medication management reduces relapse and rehospitalization and can improve functioning and quality of life.<sup>14</sup> Appropriate medication strategies include new approaches to old medications,<sup>15</sup> and new, more expensive medications with improved side-effect and efficacy profiles.<sup>16,17</sup> Both case management and family management have reduced rehospitalization rates and improved functioning.<sup>18-21</sup>

However, these treatment recommendations have not yet been employed to

## PATIENTS AND METHODS

### CLINIC SITES AND SAMPLING

Quality of care was examined at 2 very different publicly funded clinics. One clinic treated about 2000 outpatients as part of a large Veterans Affairs (VA) Medical Center serving a metropolitan area; and had strong academic affiliations, numerous psychiatric trainees, and a reputation for performing high-quality clinical research. The other clinic was an urban Community Mental Health Center (CMHC) funded by a regional mental health authority. It had no academic affiliations and about 600 outpatients in active treatment.

Patients were eligible for the study if they (1) had a diagnosis of schizophrenia or schizoaffective disorder, (2) were between 18 and 65 years old, (3) had been in treatment at the clinic for at least 3 months, (4) had spent no more than 21 days in the hospital during the previous 3 months, and (5) had at least 1 visit with a psychiatrist during a 3-month sampling period in early 1996. We excluded patients who had recent clinic admissions because assessment and engagement issues might take precedence over treatment change, and patients who had recent extensive hospitalizations because hospital clinicians might have determined the treatment regimen.

We used real-time, visit-based sampling to identify a random sample of adults with schizophrenia at each clinic. During a 3-month period, every patient who came to the clinics was screened using the eligibility criteria. To ensure that visit frequency did not affect the probability of being selected, patients were only screened at their first visit during the 3-month period. Subjects were then randomly selected from the population of eligible patients. Informed consent was obtained after the study had been fully explained.

Seventy percent of selected patients chose to participate. We interviewed 113 VA patients and 111 CMHC patients and abstracted their medical records. Nonresponders did not differ significantly from respondents on age, sex, or race. Subjects at the VA were 96% male, had a mean age of 49 years (SD = 8.5 years), and were 47% black, 42% white, and 6% Latino. Subjects at the CMHC were 56% male, had a mean age of 44 years (SD = 10.1 years), and were 88% black, 5% white, and 7% Latino. On average, VA clinic patients had been ill longer (22 vs 18 years,  $t = 2.8$ ,  $df = 222$ ,  $P = .005$ ), had a higher monthly income (\$1109 vs \$643,  $t = 6.8$ ,  $df = 211$ ,  $P < .0001$ ), and were less likely to be living with their family (38% vs 62%,  $\chi^2_1 = 13.0$ ,  $P < .001$ ).

### MEASUREMENT OF QUALITY OF CARE

#### Development of Quality Criteria

Criteria for poor-quality care were based on a comprehensive review of the literature and national treatment recommendations, particularly those of the Schizophrenia Patient

Outcomes Research Team (Schizophrenia PORT).<sup>12,25</sup> We drafted criteria that were consistent with the Schizophrenia PORT recommendations, focusing on aspects of treatment that the literature review identified as most efficacious. These draft criteria were reviewed by an advisory panel consisting of a nationally recognized expert in the treatment of schizophrenia and a prominent psychiatrist from each of the organizations being studied. Criteria were only selected if the panel (1) agreed with them, (2) believed they were important in determining outcomes, and (3) thought they could be implemented with no more than slight difficulty.

Panel members considered 7 potential medication management criteria and agreed on 3 that were used in this study: (1) *patients with significant psychotic symptoms* should have had a change in antipsychotic medication dosage or a switch to a different antipsychotic medication within 3 months, or should have been offered treatment with clozapine (a medication with greater efficacy); (2) *patients with significant akathisia or parkinsonism* should have had a reduction in the dose of antipsychotic medication, a switch to a different antipsychotic medication within 1 month, or should have been offered treatment with clozapine or risperidone (medications with fewer side effects); and (3) *patients with significant tardive dyskinesia* (TD) should have had a reduction in the dose of antipsychotic medication within 3 months, or should have been offered treatment with clozapine (a medication that causes virtually no TD).

There is limited consensus regarding which components of family management and case management are responsible for their effect on outcomes.<sup>21,24</sup> Although Assertive Community Treatment is a defined, effective case management intervention,<sup>26,27</sup> most patients do not have access to such a program, and none was offered at these clinics. Formal family psychoeducation was also rarely provided at these clinics. The quality criteria for psychosocial care did not attempt to determine whether patients were receiving effective components of family management or case management, but rather whether they received these interventions at all. The criteria examined (1) whether severely disabled patients received case management and (2) whether, for patients with close family contact, there had been any recent involvement of a family member in treatment.

#### Data Sources and Measures

A structured interview was administered to patients shortly after visiting their clinic psychiatrist. The interview included an abbreviated version of the Structured Clinical Interview for the DSM-IV, Patient Edition, Version 2.0 (SCID).<sup>28,29</sup> Fourteen potential subjects were excluded

evaluate quality of care for schizophrenia, and using them to do so poses challenges. Treatment recommendations are often quite complex and some may be too cumbersome for use at busy clinics. Further, it is unclear as to how much data, what kinds of data (process or outcome measures), and what sources of data (patient, medical records, or administrative data) will be needed to evaluate quality.<sup>22</sup>

This study describes the quality of care provided to schizophrenic patients at 2 public mental health clinics. First, we defined quality care using national guidelines, and developed a simple criteria set that examines key aspects of care that are likely to have a large effect on outcomes. For medication management, criteria for effective care are well accepted and were operationalized. Since effective case management and family management are

because the SCID did not confirm a diagnosis of schizophrenia or schizoaffective disorder. The interview assessed severity of illness using the Global Assessment of Functioning scale<sup>30</sup>, symptoms using the expanded University of California Los Angeles version of the Brief Psychiatric Rating Scale<sup>31</sup>; akathisia using the Barnes scale<sup>32</sup>; parkinsonism using items from the Liverpool University Neuroleptic Side Effect Rating Scale<sup>33</sup>; TD using the Abnormal Involuntary Movement Scale<sup>34</sup>; satisfaction with treatment using the Client Satisfaction Questionnaire<sup>35</sup>; and compliance using an established instrument.<sup>36</sup> Subjective quality of life was assessed using 1 global item from the Lehman Quality of Life Interview<sup>37</sup> and administering it twice during the interview. Subjects were asked whether they had ever been offered treatment with risperidone or clozapine. The patient interview took an average of 40 minutes to complete (SD = 9.6 minutes). An explicit, structured medical records abstraction instrument was used to collect data on medications prescribed during the past year, on documentation of symptoms and side effects, on compliance with treatment, on use of alcohol or other drugs, and on the use of treatment services. Implicit quality judgments were not made during the record abstraction. Clinical interviewers were trained to use the patient questionnaire and medical records abstraction instruments, and they had extensive training on the SCID and Brief Psychiatric Rating Scale at the University of California Los Angeles Clinical Research Center for Schizophrenia.<sup>38</sup>

#### Measurement of Quality of Medication Treatment

We operationalized the panel's criteria of "significant" symptoms and side effects using information from the patient interview. Cut points were set high enough to ensure that symptoms and side effects above the cut point would be clinically meaningful and likely to effect outcomes. Patients were defined as having significant psychotic symptoms if Brief Psychiatric Rating Scale ratings were "severe" or greater for hallucinations or suspiciousness, or "moderately severe" or greater for unusual thought content or conceptual disorganization. Patients were defined as having significant akathisia if they met Barnes<sup>32</sup> criteria for moderate, marked or severe akathisia; significant parkinsonism if they responded "a great deal" to items regarding muscle stiffness or slowing of movements; and significant TD if their Abnormal Involuntary Movement Scale ratings met criteria described by Schooler and Kane.<sup>39</sup> When we used this approach, 110 subjects were identified as experiencing significant symptoms or side effects.

Next, we classified subjects as receiving either poor- or adequate-quality medication management. To qualify for poor-quality medication management, a subject had to

meet criteria for either: A, poor-quality symptom management (management of psychotic symptoms [panel criterion 1]) or B, poor-quality side-effects management (management of akathisia, parkinsonism and TD [panel criteria 2 and 3]). Poor care was defined as either A or B since side effects and symptoms may both have a negative effect on patient outcome.

#### Measurement of Quality of Case Management and Family Management

We assessed case management only for subjects who were severely ill (Global Assessment of Functioning scale score of  $\leq 40$ ,  $n = 117$ ) because this group would be expected to be particularly disabled and in need of case management support. Poor-quality case management was defined as present if there was no evidence from the medical records or interview of contact with a case manager during the past 3 months. Assessment of family management was restricted to patients in close contact with their families ( $n = 153$ ). Close contact was defined as living with the family or having contact with the family 2 or more times per week. Poor-quality family management was defined as present if there was no evidence from the medical records or interview that clinic staff had met with or spoken to a family member during the past year.

#### Measuring Quality Using Only Secondary Data

To examine whether secondary data can be substituted for more expensive primary, patient-derived information, we developed an alternative quality-assessment method that used only medical records data. We compared this "medical records method" with the main quality-assessment method described above (which used data from both patient interviews and medical records) to model the effect of restricting data sources to patients' medical records. The medical records method used the same quality criteria as the main method. However, rather than using patient interviews to assess symptoms and side effects, the medical records method defined significant symptoms and side effects as present if they had been documented in the medical records during the past 3 months.

#### STATISTICAL ANALYSES

Data were analyzed using *t* tests for continuous variables,  $\chi^2$  tests for proportions, and Pearson correlations. Two-tailed tests of significance were used and differences were considered statistically significant at  $P = .05$ . The number of schizophrenic patients in each psychiatrist's practice was estimated by multiplying the number of study subjects in their practice by the inverse of the rate at which patients at that clinic were sampled for the study.

less well defined<sup>21,23,24</sup> we developed criteria that focus on access to these treatments. Second, we used these criteria to evaluate treatment quality at 2 clinics. Patients were interviewed and their medical records abstracted to determine whether each patient was receiving poor-quality medication management, case management, or family management. Third, to understand the contribution of the organization and its providers to treatment

quality, we examined the extent to which common quality problems could be attributed to patient as opposed to nonpatient factors. Finally, to determine whether secondary data sources can be substituted for more expensive patient-derived information, we compared quality assessment based on medical records with quality assessment based on both medical records and patient interviews.

**Table 1. Comparison Between Clinics of the Number of Subjects With Clinical Indications for a Treatment Intervention and the Number Receiving Poor-Quality Care\***

Treatment Domain	VA Clinic (n = 113)	CMHC Clinic (n = 111)	Total (N = 224)
Medication management			
With significant psychotic symptoms	30 (27)	26 (23)	56 (25)
Poor management of psychotic symptoms†	23 (20)	16 (14)	39 (17)
With significant side effects	43 (38)	33 (30)	76 (34)
Poor management of side effects‡	34 (30)	26 (23)	60 (27)
With significant symptoms or side effects	62 (55)	48 (43)	110 (49)
Overall poor medication management§	50 (44)	34 (31)	84 (38)
Case management			
With severe disability	59 (52)	58 (52)	117 (52)
Poor case management¶	11 (10)	30 (27)#	41 (18)
Family management			
In close contact with family	68 (60)	85 (77)#	153 (68)
Poor family management**	40 (35)	47 (42)	87 (39)

\*Data are given as number (percentage) of patients. *df* = 1 for all comparisons. VA indicates Veterans Affairs; CMHC, Community Mental Health Center.

†Management of psychotic symptoms (panel criterion 1).

‡Management of akathisia, parkinsonism, and tardive dyskinesia (panel criteria 2 and 3, see "Measurement of Quality of Medication Treatment" subsection of the "Patients and Methods" section).

§Poor management of symptoms or poor management of side effects. ||*P* < .05.

¶Severely disabled and not receiving case management.

#*P* < .001

\*\*Close family contact and no communication between the clinic and family.

## RESULTS

### QUALITY OF MEDICATION MANAGEMENT

Patient illness characteristics were similar at the 2 clinics. Subjects were severely ill with similar Global Assessment Functioning scale scores (mean = 44, SD = 12 at the VA; mean = 43, SD = 10 at the CMHC; *t* = .51, *df* = 222, *P* = .61). As shown in **Table 1**, there were no significant differences between the clinics in the prevalence of significant symptoms or side effects. During the 3-month sampling frame 16 subjects (7%) had 1 visit with a psychiatrist, 167 (75%) had either 2 or 3 visits, and 41 (18%) had more than 3 visits. However, usage of new medications was quite different at the 2 clinics. At the VA, formulary restrictions made risperidone difficult to prescribe, while the CMHC had no restrictions on its use. Thirty-four CMHC subjects (31%) and 6 VA subjects (5%) were prescribed risperidone ( $\chi^2_1 = 25.2$ , *P* < .001). The VA clinic had a clozapine program restricting clozapine use to a limited number of physicians and to certain patients. The CMHC had a cumbersome clozapine protocol. Only 6 VA subjects (5%) and 1 CMHC subject (1%) were prescribed clozapine ( $\chi^2_1 = 3.5$ , *P* = .06).

As shown in Table 1, 39 subjects (17%) received inappropriate management of psychotic symptoms and 60 (27%) received inappropriate management of their side

**Table 2. Number of Schizophrenic Patients in Each Psychiatrist's Practice and the Proportion of These Patients With Poor-Quality Medication Management\***

	No. of Subjects in Psychiatrist's Practice	No. of Schizophrenic Patients in Psychiatrist's Practice†	% of Schizophrenic Patients Receiving Poor-Quality Care
VA clinic psychiatrists			
Staff psychiatrist No.			
1	44	99	36
2	23	52	48
3	15	34	60
4	7	16	29
5	6	13	83
6	2	4	100
Resident psychiatrists as a group‡	16	36	31
CMHC clinic psychiatrists			
Staff psychiatrist No.			
1	52	92	25
2	27	48	30
3	17	30	35
4	15	27	47

\*VA indicates Veterans Affairs; CMHC, Community Mental Health Center.

†Calculated from the number of study subjects in practice (see "Patients and Methods" section of the text).

‡Eight residents were grouped.

effects. Differences between clinics in the quality of symptom and side-effect management did not reach statistical significance. However, overall poor-medication management occurred more often at the VA clinic (44% vs 31%,  $\chi^2_1 = 4.4$ , *P* = .04). When compared with the 140 patients without poor medication management, the 84 patients receiving poor-quality medication management had a significantly lower quality of life on the Quality of Life Interview item (4.01 vs 4.64, *t* = 3.1, *df* = 222, *P* = .002), and a nonsignificant trend toward lower satisfaction with treatment on the Client Satisfaction Questionnaire (3.30 vs 3.41, *t* = 1.5, *df* = 222, *P* = .15).

Thirty-four of the 84 patients receiving poor-quality medication management had patient factors that could have contributed to this care. Specifically, 30% of poor care occurred in patients who were poorly compliant, 21% occurred in patients using alcohol or other drugs, and 6% occurred in patients with other patient-related factors, such as refusal of the recommended treatment. Poor care without contributing patient factors was significantly more common at the VA than the CMHC (28% vs 16%,  $\chi^2_1 = 4.7$ , *P* = .03).

Some psychiatrists had practices that included many more patients with schizophrenia and appeared, therefore, to "specialize" in the treatment of this disorder. As shown in **Table 2**, these psychiatrists tended to deliver better-quality care for schizophrenia, although this trend was not significant (*r* = 0.60, *P* = .06). Even though postgraduate trainees (ie, residents) at the VA clinic treated relatively few patients, they had ongoing teaching from experts in schizophrenia and provided treatment quality similar to that of the most effective staff psychiatrists.

**Table 3. Identification of Poor-Quality Medication Management by a Method That Uses Only Secondary Data From Medical Records, in Comparison With a Method That Also Uses Interview Data\***

Data Source for Quality Assessment	Subjects Identified as Receiving Poor-Quality Care		
	VA Clinic (n = 113)	CMHC Clinic (n = 111)	Total (N = 224)
Interview and medical records data combined	50 (44)	34 (31)	84 (38)
Medical records data only	14 (12)	33 (30)	47 (21)
Poor-quality care identified by both methods	10 (9)	16 (14)	26 (12)

\*The method that used only medical records data is compared with the main quality-assessment method, which used primarily data from patient interviews in addition to secondary data from medical records. Data are given as number (percentage) of patients. VA indicates Veterans Affairs; CMHC, Community Mental Health Center.

### QUALITY OF CASE MANAGEMENT AND FAMILY MANAGEMENT

Although severely ill patients composed 52% of patients at both clinics, the VA provided significantly more of these patients with case management (Table 1). There was also a trend toward the VA providing more intensive case management, with 19 severely ill subjects (32%) receiving more than 1 contact per month, as opposed to 10 similar CMHC subjects (17%) ( $\chi^2_1 = 3.5, P = .06$ ). Unlike case management, there was no significant difference between the clinics in the extent to which families were involved in the treatment process (Table 1). At both clinics more than half of the families caring for a schizophrenic relative had no communication with the clinic during the past year.

### QUALITY AS EVALUATED BY SECONDARY DATA ALONE

Quality assessment using patient interviews is substantially more expensive than using secondary data sources alone. However, as shown in **Table 3**, quality assessment that did not use patient-derived data produced strikingly different results. Relative to the main method of assessing the quality of medication management, assessment based only on the medical records identified fewer subjects as receiving poor-quality care (47 vs 84), and detected just 26 (31%) of the 84 subjects with poor-quality care. Also, the medical records method performed very differently at the 2 clinics. Differences in medical records documentation at the 2 clinics would have led to incorrect identification of the CMHC as delivering worse-quality medication management. Although both clinics documented significant symptoms and side effects at similar rates, the CMHC had a much higher rate of documentation of symptoms and side effects that were not severe enough to reach our cut off. Since the severity of symptoms was rarely documented, this led the medical records method to overstate the prevalence of symptoms and side effects at the CMHC. The medical records were of limited use in the assessment of case manage-

ment and family management because there rarely was recent documentation of severity of illness or whether patients were in close contact with their families.

### COMMENT

This is one of the first studies to measure quality of outpatient care for schizophrenia using direct patient assessment and criteria derived from national treatment recommendations. By comparing treatment guidelines with actual care, we found that poor-quality care was common at the 2 sites studied, and we identified key problems in care that might be useful targets for quality-improvement efforts. At these clinics, 38% of schizophrenic patients were receiving poor-quality medication management, 18% were severely disabled and receiving no case management, and 39% were cared for by their families without any recent contact between the clinic and family. Since we used relatively stringent criteria to define poor care, some poor care may have gone undetected. Although very little is known about the quality of care provided at other mental health clinics, we have no reason to believe that our study sites are unusual, and consequently, our study raises serious concerns about quality of care for this population. The level of treatment quality that we observed appears similar to or worse than levels of poor care reported for common medical and surgical conditions,<sup>40</sup> other disenfranchised populations,<sup>41</sup> and private-sector patients with depression.<sup>42</sup>

As with nonpsychiatric disorders,<sup>43,44</sup> this study found that the choice of data source can have a powerful effect on the detection of poor-quality care, and that the accuracy of medical records cannot be taken for granted. When we relied on medical records rather than patient interviews, we were unable to identify many patients receiving poor-quality care. This occurred because significant symptoms and side effects reported to us by patients were often undocumented in medical records. Psychotic symptoms were only documented in 48% of the patients with significant psychotic symptoms, and side effects were only documented in 14% of the patients with significant side effects. Also, quality assessment based only on medical records would have incorrectly identified the CMHC as having worse-quality medication management. Although there are cost advantages to using only automated or medical records information for quality assessment, at these clinics approaches based on the medical records would have led to misleading conclusions about the quality of care.

Although we cannot distinguish whether the absence of symptoms and side effects in the medical records is due to poor documentation or a failure to detect, the low rate of documentation raises concerns about detection. At the CMHC, psychiatric treatment occurred in a private, confidential office for 20 to 30 minutes. At the VA, treatment usually occurred in "medication groups" that were 1 to 2 hours in length and attended by up to 25 patients (mean patient count = 7.9, SD = 4.4). Patients waited in chairs around the treatment room for their turn to briefly speak with the psychiatrist and case manager at the front of the room. It is possible that the briefer consultation and lower level of confidentiality associ-

ated with these groups reduced the elicitation and documentation of symptoms and side effects.

Our findings suggest potential quality-improvement approaches that are specific to each clinic's strengths and weaknesses. A substantial amount of poor care resulted from failure to make any change in medications over a long period. Clinician awareness of symptoms and side effects might be improved at both clinics with routine monitoring. However, in one third of the cases of poor care, symptoms or side effects were detected and documented but no intervention was undertaken. Provider education could be increased or patients directed toward psychiatrists who specialize in the treatment of this disorder. Particularly at the VA, it is possible that increased access to new medications would encourage physicians to intervene more aggressively. Both clinics should consider enhanced case management and family management. However, the effects of quality-improvement interventions such as these are not necessarily predictable and should be evaluated.

The strengths of our methods include the use of validated clinical instruments and interviewers with intensive training in these instruments. Although the methods developed here are only one of many possible approaches to measuring quality of care for schizophrenia, the efficacy literature suggests that poor care defined by our criteria leads to poor outcomes. However, several important limitations should be considered when interpreting our results. Our study focused on recent treatment, such as medication changes during the past 3 months. Since many of these patients had been treated for years, it is conceivable that all appropriate treatment strategies had been tried and found to be ineffective. However, with regard to medication treatment, the criteria recommend treatment with risperidone or clozapine for patients failing other strategies, and care was not judged to be poor if the patient had ever been offered these medications. Also, nonresponse bias can be an important problem with severely mentally ill populations. This study achieved an adequate response rate by using a visit-based sample of patients in treatment during a defined time frame. However, this design is biased toward patients in regular care. These patients may be more compliant, have less drug use, and be receiving higher-quality care than populations drawn from other clinics or the community.

Further research is needed to develop clinically useful quality assessment methods that are inexpensive enough to incorporate into routine practice. Detailed clinical assessments by highly trained staff will not be practical at many busy clinics. However, quality assessment based on the current medical records at these clinics missed most of the poor-quality care. Before quality measurement can become routine in "real world" settings, researchers may need to evaluate assessment tools that use more self-report data along with structured, automated medical records systems that interact with clinicians.

Information on treatment quality cannot only help consumers and purchasers choose between alternative programs, but it can also be used by policy makers, managers, and clinicians to identify aspects of treatment that may need to be changed. Findings from this study are consis-

tent with the theory that treatment quality may be influenced by (1) organizational policies, such as formularies, (2) patient factors, such as noncompliance, and, (3) clinician factors, such as specialization. Policy makers may be interested in studying, for instance, how formulary restrictions or a patient's sex affect the quality of medication management. At a clinical level, this study suggests that programs providing care for schizophrenia should consider measuring and improving the quality of the treatment they provide. Research will be needed to test the effect of specific quality-improvement interventions on patient outcomes and cost if we wish to ensure that people with schizophrenia receive the best care possible.

Accepted for publication March 19, 1998.

This research was supported in part by the Department of Veterans Affairs, Veterans Health Administration, Health Services Research and Development Service as Robert Wood Johnson Clinical Scholars Fellows' Health Services Research and Development Project IIR 95-132 (Dr Young); by the Robert Wood Johnson Foundation Clinical Scholars Program at University of California, Los Angeles; by a National Alliance for Research on Schizophrenia and Depression Young Investigator Award (Dr Young); by the National Institute of Mental Health University of California, Los Angeles Research Center on Managed Care for Psychiatric Disorders (grant P50 MH-54623); and by the VISN 22 Mental Illness Research Education and Clinical Center of the Department of Veterans Affairs. Diagnostic and symptom assessment training was supported by grant MH-30911 from the National Institute of Mental Health University of California Los Angeles Clinical Research Center for Schizophrenia.

Preliminary results were presented at the annual meeting of the Robert Wood Johnson Clinical Scholars Program, Fort Lauderdale, Fla, November 16, 1996; and at the National Institute of Mental Health Conference on Improving the Condition of People with Mental Illness, Washington, DC, September 5, 1997.

The views expressed in this article do not necessarily represent the views of the Department of Veterans Affairs or of the US government.

The authors would like to acknowledge Nihua Duan, PhD, Robert Liberman, MD, Stephen Marder, MD, Elizabeth McGlynn, PhD, and Kenneth Wells, MD, for their valuable consultation to the project; and Lindsey Bergman, PhD, Leslie Tepper, PhD, and Roberto Zarate, PhD, for their contributions to collection of the data; and clinicians and managers at the clinics for their support.

Reprints: Alexander S. Young, MD MSHS, UCLA Neuropsychiatric Institute, 760 Westwood Plaza, Los Angeles, CA 90024-1759.

## REFERENCES

1. Iglehart JK. Managed care and mental health. *N Engl J Med.* 1996;334:131-135.
2. Lurie N, Moscovice IS, Finch M, Christianson JB, Popkin MK. Does capitation affect the health of the chronically mentally ill? results from a randomized trial. *JAMA.* 1992;267:3300-3304.
3. Rogers WH, Wells KB, Meredith LS, Sturm R, Burnam MA. Outcomes for adult outpatients with depression under prepaid or fee-for-service financing. *Arch Gen Psychiatry.* 1993;50:517-525.

4. Soumerai SB, McLaughlin TJ, Ross-Degnan D, Casteris CS, Bollini P. Effects of a limit on Medicaid drug-reimbursement benefits on the use of psychotropic agents and acute mental health services by patients with schizophrenia. *N Engl J Med*. 1994;331:650-655.
5. Dixon K, Croze C. Improving public/private partnership in managed behavioral healthcare. *Behav Healthcare Tomorrow*. 1997;6:67-75.
6. Bickman L, Salzer MS. Measuring quality in mental health services. *Eval Rev*. 1997;21:285-291.
7. Torrey EF, Erdman K, Wolfe SM, Flynn LM. *Care of the Seriously Mentally Ill: A Rating of State Programs*. Washington, DC: Public Citizen Health Research Group and the National Alliance for the Mentally Ill; 1990.
8. Kissling W. Compliance, quality assurance and standards for relapse prevention in schizophrenia. *Acta Psychiatr Scand Suppl*. 1994;382:16-24.
9. McGlynn EA, Norquist GS, Wells KB, Sullivan G, Liberman RP. Quality-of-care research in mental health: responding to the challenge. *Inquiry*. 1988;25:157-170.
10. American Psychiatric Association Steering Committee. The Expert Consensus Guideline Series: treatment of schizophrenia. *J Clin Psychiatry*. 1996;57:3-58.
11. American Psychiatric Association. Practice guideline for the treatment of patients with schizophrenia. *Am J Psychiatry*. 1997;154:1-63.
12. Lehman AF, Steinwachs DM. Translating research into practice: the Schizophrenia Patient Outcomes Research Team treatment recommendations. *Schizophr Bull*. 1998;24:1-10.
13. Lehman AF, Carpenter WTJ, Goldman HH, Steinwachs DM. Treatment outcomes in schizophrenia: implications for practice, policy, and research. *Schizophr Bull*. 1995;21:669-675.
14. Kane JM, Marder SR. Psychopharmacologic treatment of schizophrenia. *Schizophr Bull*. 1993;19:287-302.
15. Dixon LB, Lehman AF, Levine J. Conventional antipsychotic medications for schizophrenia. *Schizophr Bull*. 1995;21:567-77.
16. Marder SR, Meibach RC. Risperidone in the treatment of schizophrenia. *Am J Psychiatry*. 1994;151:825-835.
17. Buchanan RW. Clozapine: efficacy and safety. *Schizophr Bull*. 1995;21:579-591.
18. Bond GR, Miller LD, Krumwied RD, Ward RS. Assertive case management in three CMHCs: a controlled study. *Hosp Community Psychiatry*. 1988;39:411-418.
19. Scott JE, Dixon LB. Assertive community treatment and case management for schizophrenia. *Schizophr Bull*. 1995;21:657-668.
20. Hogarty GE, Anderson CM, Reiss DJ, Kornblith SJ, Greenwald DP, Ulrich RF, Carter M. Family psychoeducation, social skills training, and maintenance chemotherapy in the aftercare treatment of schizophrenia, II: two-year effects of a controlled study on relapse and adjustment. *Arch Gen Psychiatry*. 1991;48:340-347.
21. Dixon LB, Lehman AF. Family interventions for schizophrenia. *Schizophr Bull*. 1995;21:631-643.
22. Brook RH, McGlynn EA, Cleary PD. Quality of health care, part 2: measuring quality of care. *N Engl J Med*. 1996;335:966-970.
23. Brekke JS. What do we really know about community support programs? strategies for better monitoring. *Hosp Community Psychiatry*. 1988;39:946-952.
24. Holloway F. Case management for the mentally ill: looking at the evidence. *Int J Soc Psychiatry*. 1991;37:2-13.
25. Lehman AF, Thompson JW, Dixon LB, Scott JE. Schizophrenia: treatment outcomes research--editors' introduction. *Schizophr Bull*. 1995;21:561-566.
26. Olfson M. Assertive community treatment: an evaluation of the experimental evidence. *Hosp Community Psychiatry*. 1990;41:634-641.
27. McGrew JH, Bond GR. Critical ingredients of assertive community treatment: judgments of the experts. *J Ment Health Adm*. 1995;22:113-125.
28. First MB, Spitzer RL, Gibbon M, Williams JBW. *Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Patient Edition, Version 2.0*. New York, NY: New York State Psychiatric Institute; 1995.
29. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders: DSM-IV*. Washington, DC: American Psychiatric Association; 1994.
30. Jones SH, Thornicroft G, Coffey M, Dunn G. A brief mental health outcome scale. Reliability and validity of the Global Assessment of Functioning (GAF). *Br J Psychiatry*. 1995;166:654-659.
31. Ventura J, Lukoff D, Nuechterlein KH, Liberman RP, Green MF, Shaner A. Brief Psychiatric Rating Scale (BPRS) expanded version (4.0): scales, anchor points and administration manual. *Int J Methods Psychiatr Res*. 1993;3:227-243.
32. Barnes TR. A rating scale for drug-induced akathisia. *Br J Psychiatry*. 1989;154:672-676.
33. Day JC, Wood G, Dewey M, Bentall RP. A self-rating scale for measuring neuroleptic side-effects. Validation in a group of schizophrenic patients. *Br J Psychiatry*. 1995;166:650-653.
34. Munetz MR, Benjamin S. How to examine patients using the Abnormal Involuntary Movement Scale. *Hosp Community Psychiatry*. 1988;39:1172-1177.
35. Larsen DL, Attkisson CC, Hargreaves WA, Nguyen AT. Assessment of client-patient satisfaction: development of a general scale. *Eval Program Plann*. 1979;2:197-207.
36. Miklowitz DJ, Goldstein MJ, Nuechterlein KH, Snyder KS, Doane JA. Expressed emotion, affective style, lithium compliance, and relapse in recent onset mania. *Psychopharmacol Bull*. 1986;22:628-632.
37. Lehman AF. The well-being of chronic mental patients. *Arch Gen Psychiatry*. 1983;40:369-373.
38. Ventura J, Green MF, Shaner A, Liberman RP. Training and quality assurance with the Brief Psychiatric Rating Scale: "the drift busters." *Int J Methods Psychiatr Res*. 1993;3:221-244.
39. Schooler NR, Kane JM. Research diagnoses for tardive dyskinesia. *Arch Gen Psychiatry*. 1982;39:486-487.
40. Rubenstein LV, Kahn KL, Reinisch EJ, Sherwood MJ, Rogers WH, Kamberg C, Draper D, Brook RH. Changes in quality of care for five diseases measured by implicit review, 1981 to 1986. *JAMA*. 1990;264:1974-1979.
41. Kahn KL, Pearson ML, Harrison ER, Desmond KA, Rogers WH, Rubenstein LV, Brook RH, Keeler EB. Health care for black and poor hospitalized Medicare patients. *JAMA*. 1994;271:1169-1174.
42. Wells KB, Sturm R, Sherbourne CD, Meredith LS. *Caring for Depression*. Cambridge, Mass: Harvard University Press; 1996.
43. Hannan EL, Kilburn H Jr, Lindsey ML, Lewis R. Clinical versus administrative data bases for CABG surgery: does it matter? *Med Care*. 1992;30:892-907.
44. Hartz AJ, Kuhn EM. Comparing hospitals that perform coronary artery bypass surgery: the effect of outcome measures and data sources. *Am J Public Health*. 1994;84:1609-1614.