

Evaluation of Outcomes for Atypical Antipsychotic Therapy and Psychosocial Rehabilitation in a Community Mental Health Center Setting

Based on a presentation by Douglas Noordsy, MD

Presentation Summary

Efficacy studies provide information on drug safety and its effect on symptoms, but their designs limit the general application of results to other settings. Functional outcomes, although difficult to measure, offer the most complete view of a medication's effect on the patient. A community mental health center (CMHC) is a common forum for treating schizophrenic patients, which presents an opportunity to study a drug's effect on patients in a natural setting. This study setting is useful because in the community patients face daily

life situations, interact with family members and caregivers, and may suffer from comorbid illnesses or conditions that can affect outcomes. Douglas Noordsy, MD, Medical Director of the Mental Health Center of Greater Manchester, New Hampshire, has begun a study to examine the effectiveness of olanzapine compared with the effectiveness of typical antipsychotic medications in the CMHC setting. The initial data in Dr. Noordsy's study confirm the benefits of olanzapine for clinical symptoms and suggest positive results for functional outcomes in the future.

Serendipity presented Douglas Noordsy, MD, Medical Director of the Mental Health Center of Greater Manchester, New Hampshire with an opportunity to examine the effect of olanzapine in a common, but seldom studied setting—the community mental health center (CMHC). As medical director, Dr. Noordsy took advantage of the release of olanzapine to open use in October 1996 to initiate a Mental Health Center (MHC) initiative to understand what impact this new agent was going to have on the clinical population. Because this was not an experimental study, Dr. Noordsy made full use of his experience in services research and out-

comes as a clinician and coinvestigator and included both functional and clinical outcome measures. His work, using a CMHC setting, focuses on the effectiveness of olanzapine. According to Dr. Noordsy, olanzapine was an attractive agent to study because of its promising chemical structure, mechanism of action, and clinical effect. Its effects on negative symptoms of psychotic disorders are well characterized, and it is easy to use.¹⁻³ "It looked like a promising agent," he noted.

Despite the reported success of olanzapine, the efficacy studies provide relatively limited information to clinicians interested in optimizing outcomes for all types of patients.

Dr. Noordsy noted that, “although these outcomes are superior to those for typical antipsychotics, we still have a long way to go to demonstrate optimum symptom control.” This idea prompted him to examine the total effect—medication outcomes plus the effects of psychosocial rehabilitation programs—that may be achieved beyond what traditional efficacy studies can address.

The Case for Effectiveness Studies

Inherent in the design of efficacy studies is a relatively narrow patient population. Patients with comorbid conditions and treatment-refractory psychosis may be excluded, and those included in the study may then fall into narrow diagnostic groups (ie, schizophrenia and schizoaffective dis-

order). A study duration of 6 weeks was typical, and the longest studies reported to date stopped at 1 year. In olanzapine efficacy studies, dosing was limited to 20 mg/day and did not allow augmentation or use of other psychotropic agents.

“One of my patients in the MHC initiative study was also treated in the initial efficacy study of olanzapine but withdrew because she couldn’t be treated with an antidepressant at the same time. She had schizoaffective disorder with severe depression that wasn’t getting better. I think this is a good example of how that study design limited the ability to demonstrate this patient’s otherwise potentially good response,” Dr. Noordsy said, noting that, “she actually was getting a good antipsychotic response in that study.”⁴

Another limitation in efficacy studies that is significant to Dr. Noordsy is the circumscribed clinical environment created by double-blind conditions and treatment settings that do not include CMHC sites or rehabilitation treatments.

Effectiveness is a broad measurement that provides information on the overall outcomes of a treatment decision in clinical practice, according to Dr. Noordsy. There are some limitations to this type of study such as imprecision, observer bias, and the difficulty of drawing cause-and-effect conclusions about observed outcomes. However, broader data generated from this type of study are important when making daily treatment decisions in complex patients (Table 1). Dr. Noordsy has found the actions of CMHC to be appropriate in looking at this wider view because it is a natural setting in which treatment addresses daily life situations that may affect outcomes. The prescribing patterns in this MHC initiative study also offer interesting insights, particularly because the prescribing habits are more natural and indicative of everyday practice.

Table 1. Efficacy Versus Effectiveness

| |
|--|
| <p>Efficacy studies isolate treatment effect</p> <ul style="list-style-type: none"> ■ Narrow patient population ■ Random assignment to treatment group <p>Advantages:</p> <ul style="list-style-type: none"> ■ Blinding controls observer bias ■ Randomization controls subject bias <p>Disadvantages:</p> <ul style="list-style-type: none"> ■ Limits dosage ■ Often limits augmentation ■ Often limits use of other agents <p>Effectiveness studies capture total effect</p> <ul style="list-style-type: none"> ■ Placebo effects ■ Therapeutic alliance ■ Symbiotic interactions with other treatments <p>Advantages:</p> <ul style="list-style-type: none"> ■ Wider field of vision ■ Maximal therapeutic benefits ■ High generalizability <p>Disadvantages:</p> <ul style="list-style-type: none"> ■ Imprecise ■ Observer bias ■ Difficulty of drawing cause-and-effect conclusions |
|--|

MHC Study Design

From October 1996, when olanzapine was first released, through June 1998, 120 consecutive patients were recruited when they initiated treatment with olanzapine. The patients came from the Community Support Program of the Mental Health Center of Greater Manchester. For a comparison group 50 patients, who were on typical medications and whose baselines were set at the time they consented to participate in the study were selected from the same clinical program. In this program, all patients have access to research-based, state-of-the-art, psychosocial rehabilitation interventions that are integrated into clinical care.

Those in the olanzapine-treated group were primarily “switchers” (ie, patients who may have been on an older product and switched), and approximately 10% were new patients. Baseline assessments identified the patient’s reasons for switching to olanzapine treatment. The baseline log also identified patients’ overall clinical condition at initiation: Are they refractory? Are they having a relapse? Are they having predominantly negative symptoms? Is there a history of tardive dyskinesia (TD) or treatment with other atypical agents?

The comparison group was kept on the older medications. “We didn’t want to get people in the comparison group who were going to switch to an atypical agent fairly soon. We talked to patients about it. If they were fairly committed to sticking to typical treatment, they were then followed in the comparison group,” Dr. Noordsy explained.

Every patient in both groups was followed for 12 months from the time he or she joined the study. The end date of this MHC initiative study is July 1999; however, Dr. Noordsy hopes to conduct a follow-up study 2 years after that date.

Assessments

The timeline of assessments throughout the 12-month evaluation

period includes several outcome measurements, which are listed in Table 2. All patients have a case manager and a psychiatrist in the CMHC clinical team (ie, a psychiatrist, 3 to 7 case managers, a nurse, and a vocational counselor). Because olanzapine is being used in special populations—patients with comorbid substance abuse and medical conditions, older patients, and patients taking combined therapies or high-dose olanzapine—safety issues are important to assess. The data are being monitored for any evidence of increased side effects, new adverse events, and new-onset TD.

Each clinical team psychiatrist rates the Brief Psychiatric Rating Scale (BPRS) every 6 months and an abridged version of the BPRS, which focuses on symptoms of psychiatric disorders, every 3 months for each patient. At the 3-month assessment, the psychiatrist also compiles subjective reports from the patients about

Table 2. Timeline of Assessments

| | Baseline | 3 mo | 6 mo | 9 mo | 12 mo |
|---------------|----------|------|------|------|-------|
| Baseline log | X | | | | |
| Follow-up log | | X | X | X | X |
| CGI | X | X | X | X | X |
| BPRS | X | | X | | X |
| CMRS+ | X | | X | | X |
| MHSIP | X | X | X | X | X |
| AIMS | X | | X | | X |
| Chart review | | | X | | X |

AIMS = Abnormal Involuntary Movement Scale; BPRS = Brief Psychiatric Rating Scale; CGI = Clinical Global Impressions scale; CMRS+ = Case Management Rating Scale; and MHSIP = Mental Health Statistics Improvement Project.

how they feel the medication is helping them, whether they are experiencing any side effects or adverse events, and whether they have discontinued treatment.

“The modified Case Management Rating Scale (CMRS+) was our functional outcome,” Dr. Noordsy said. It is a modified version of a scale developed 15 years ago for a hospital after-care study, which focused on the support available to the patient in the community.⁵ The CMRS+ contains subscales: psychosocial, which evaluates numerous aspects of functioning, including legal problems, social relationships, finances, ability to maintain a home, and vocational functioning, and illness. Another component of that scale focused on substance abuse. The substance abuse ratings are now well validated and considered to be the most reliable measurement of substance abuse in the severely mentally ill. However, other components of the modified CMRS+ have not yet gone through such rigorous evaluation. “We modified those subscales to move them into a highly versus minimally functioning rating, as opposed to a supportive or less-supportive environment,” Dr. Noordsy noted.

The case manager performs the CMRS+ rating every 6 months and is instructed to rate the previous 3-month period of time using all available information on the patient to rate symptoms and psychosocial functioning. “The CMRS+ is not a patient self-report,” Dr. Noordsy explained. “It includes all viewpoints on the patient, with reports from the family, employers, landlords, or other caregivers contributing to the rating. It helps maximize the field of view and inclusiveness of clinical data about the patient.”

Along with Abnormal Involuntary Movement Scale (AIMS) screens every 6 months, Dr. Noordsy’s group collects data from the CMHC database on service utilization, that is, hospital-

ization, emergency contacts, and partial hospital and outpatient care.

Investigators in the MHC initiative also used data from the Mental Health Statistics Improvement Project (MHSIP)—a National Institute of Mental Health-funded project operated by the New Hampshire Division of Behavioral Health. This project generates standardized ratings on all severely mentally ill patients treated in the CMHC system. With 4 years of data predating the study start date, MHSIP allows the investigators to access a long history of baseline measurements such as substance abuse, vocational functioning, housing, and other functional outcomes. Whereas MHSIP data is not as detailed as that of the CMRS+, it acts as a validating measure and a historical baseline. Dr. Noordsy will look at the day when patients enter the study so he can see whether there is a change in the patient’s trajectory toward recovery.

Global psychosocial functioning can be measured by the CMRS+ and MHSIP. Specific subscales in them provide information on vocational functioning within work, the type of work setting, and the amount of work. Psychosocial outcomes also include family and social relationships, medication compliance ratings, and legal problems.

MHC Initiative Study Goals

For it to reflect the wider view of patient outcomes, Dr. Noordsy’s MHC initiative study aims to answer 4 fundamental questions:

- 1) How is olanzapine used in the CMHC setting?
- 2) How effective is switching to an olanzapine prescription in this setting?
- 3) What is the best effect of olanzapine on psychosocial outcomes?
- 4) What is the safety profile of olanzapine in a broader population?

By studying how olanzapine is used in the CMHC setting, Dr. Noordsy also

hopes to discover why a prescribing psychiatrist would choose to switch a patient to olanzapine.

To accomplish these goals, the patient profiles in the group can also be reviewed, including diagnosis, age, and comorbid axis III disorders. "Preliminary results from the study indicate that patient diagnoses are predominantly schizophrenia/schizoaffective disorder, with less than 20% having other diagnoses," said Dr. Noordsy, adding that in this study's patient population, the effect of olanzapine in patients with other diagnoses will be explored. "These analyses will also offer information to community clinicians who are using this agent and need to know how these data apply when patients with medical disorders or substance abuse diagnoses are included." Negative symptoms can be evaluated as well, and, as Dr. Noordsy noted, the data on substance abuse will be available from the MHSIP and CMRS+ scales.

Evaluating the maximal antipsychotic effect also takes into consideration the use of combined medications, a treatment-refractory subgroup, higher doses of olanzapine, and improvement in preexisting TD in patients who switched to olanzapine because of their TD symptoms. A subjective rendering of the benefits by patients can be obtained through interviews with the psychiatrist. "We hope to augment that aspect at some point with a more specific evaluation of subjective experiences," Dr. Noordsy explained.

Study Limitations

Dr. Noordsy noted that the BPRS has limited measures of negative symptoms, and that the broad scope of patients and outcome measurements present numerous potential questions and substudies. Separating the effects of olanzapine and rehabilitation will be difficult, but some information may be gained. Dr. Noordsy predicted, "The comparison between

the conventional antipsychotic-treated group and the olanzapine group will give us some ability to separate out treatment differences in terms of overall outcomes, functional and symptomatic. By contrasting that data with preexisting efficacy studies, we may be able to get some estimate of the effect intensive psychosocial rehabilitation programs have in creating an overall impact."

"These analyses will also offer information to community clinicians who are using this agent and need to know how these data apply when patients with medical disorders or substance abuse diagnoses are included."

Interrater reliability is being tested, because raters (ie, clinicians and caregivers) were not blinded. Validity crosschecks are also in place as most criteria are rated in more than one way. For example, the MHSIP and CMRS+ gauge functional measures. Symptoms are observed by the clinician in the CMRS+ and by the psychiatrist in the BPRS.

Dr. Noordsy noted potential differences in baseline points between the 2 study groups and the need to consider regression toward the mean when interpreting treatment effects. Patients in the olanzapine-treated group may start the study in an episode of illness that leads to a decision to switch medications. Groups of patients who start a study in an episode of illness are going to fare better with time alone. Dr. Noordsy explained, "The decision to initiate treatment with olanzapine versus participating in the study with no treatment change may not have been equal. As a result, we will match for

baseline clinical status in the final analysis because only then can we be comfortable that the differences between the 2 groups are related to medication and not to recruitment differences.”

Table 3. The Effectiveness of Olanzapine in an Academic Community Mental Health Setting: Focus on Psychosocial Rehabilitation Outcomes

| Pilot Data: Baseline Versus 6 months | | | | |
|--------------------------------------|-----------------------------|----------|-------|--------|
| value | | Baseline | 6 mos | P |
| BPRS | | | | |
| (n = 33) | Total | 70.1 | 45.8 | 0.0001 |
| | Hallucinations | 4.1 | 3.4 | 0.008 |
| | Delusions | 4.6 | 3.7 | 0.015 |
| | Disorganization | 3.2 | 1.9 | 0.0001 |
| | Self-neglect | 2.8 | 1.8 | 0.001 |
| | Blunted affect | 3.4 | 1.6 | 0.0001 |
| CMRS+ | | | | |
| (n = 67) | Illness Subscale Total | 38.4 | 31.0 | 0.0001 |
| | Negative symptoms | 3.2 | 2.8 | 0.002 |
| | Cognitive impairment | 2.2 | 1.8 | 0.008 |
| | Alcohol use | 2.1 | 1.7 | 0.001 |
| | Drug use | 1.7 | 1.4 | 0.008 |
| | Psychosocial Subscale Total | 36.1 | 30.2 | 0.0001 |
| | Social relationships | 4.0 | 3.2 | 0.0001 |

BPRS ratings: 1 = not present
 2 = very mild
 3 = mild
 4 = moderate
 5 = moderately severe
 6 = severe
 7 = extremely severe

CMRS+ illness subscale ratings:
 1 = not present
 2 = mild
 3 = moderate
 4 = severe
 5 = extremely severe

CMRS+ psychosocial subscale ratings:
 1 = highly functional
 2 = substantially functional
 3 = moderately functional/moderately impaired
 4 = substantially impaired
 5 = highly impaired

Pilot Data

The MHC initiative 6-month pilot data dealt solely with olanzapine-treated patients and showed statistically significant reduction in total BPRS scores and significant improvement in CMRS+ illness, negative symptoms, and cognitive impairment subscales (Table 3). Data on the comparison group were not yet available because these patients were recruited later in the study.

The pilot data showed that after 6 months there was a 50% reduction in average BPRS scores for olanzapine-treated patients. The PANSS data from olanzapine versus risperidone showed only one quarter of the patients achieved a 50% improvement in 6 months’ time, with olanzapine-treated patients significantly more likely to obtain >50% improvement than risperidone-treated patients.⁶ (It should be noted that 50% improvement is a very stringent response criteria; 20% is more commonly used.) Taking into consideration the problem of a direct comparison of the 2 studies—patient populations and dosing may have differed substantially—Dr. Noordsy noted there is still a suggestion that the MHC is achieving more overall improvement in symptoms with combined treatment.

In the MHC study, twice as many patients in the pilot sample had undergone the CMRS+ rating as had undergone the BPRS rating, and the improvement was consistent with that achieved using the BPRS data.

Social relationships and vocational functioning that were assessed on the psychosocial subscale of the CMRS+ show interesting trends, improving from severely impaired to moderately impaired after 6 months on average. “It will be very interesting to see whether they will continue to rise by the 1-year point,” Dr. Noordsy said.

Pilot data on CMRS+ alcohol and drug abuse subscales scores show notable improvements in ratings as well. However, Dr. Noordsy stated at

this early stage of data collection these scores are not as significant as other CMRS+ data because on average patients started at a level of “use with no impairment” and moved to “no use.” As a result, Dr. Noordsy plans to select a subgroup that starts with a substance use disorder and watch its course of response.

Summary

By definition, effectiveness takes a broader view than efficacy by looking at the overall impact of a treatment decision on the patient. A setting such as a CMHC offers the opportunity to evaluate the effectiveness of a drug in many patients with psychotic disorders. Because of the impressive performance of olanzapine in the early efficacy trials, defining its role in the spectrum of treatments for schizophrenic patients with comorbid illnesses or concomitant medications is critical.

The pilot data in Dr. Noordsy’s study utilizes several outcomes to confirm the benefits of olanzapine for treating clinical symptoms. Clinicians in the field who treat patients who have many complicating factors that affect clinical and psychosocial outcomes need such data to make informed treatment decisions on a day-to-day basis. Early efficacy studies are the cornerstone of a drug’s acceptance, but overall outcomes are important in determining its usefulness in everyday practice.

Acknowledgement

Christopher O’Keefe, MA, of the Mental Health Center of Greater Manchester assisted in the study design and collection of data.

... DISCUSSION HIGHLIGHTS ...

Dr. Tunis: Do you have a problem with missing data in your setting, or were you able to get all your data at 6 months?

Dr. Noordsy: We have very little trouble with missing data because we can track people over time. We don’t lose many people. For the few who missed a certain assessment, we go on to the next assessment but obtain what information we can from chart review. They’ve usually been seen by a clinician. We have separately indicated patients who have undergone chart review so we can eliminate them from analyses if necessary to ensure reliability.

Dr. Tunis: Why did you have 67 patients in the CMRS+ sample but only 33 in the BPRS?

Dr. Noordsy: That is because the CMRS+ does not rely on an interview. The case manager conducts it at the beginning of the month it is due. The assessment forms are sent to the case manager, who completes them and sends them back. At this point in time, 67 people had been in the study for 6 months, and half of those had their first BPRS rating; the other half were scheduled to receive it.

Dr. Mauskopf: Do you have any sense of the regression to the mean? Are there placebo groups in studies from baseline to 6 months with which you could compare these changes? It might give you some idea of whether they are a natural disease history versus olanzapine effect.

Dr. Noordsy: The subgroups, as we identified them at the start of the study, would be a good way to look at that. The group I would expect to have the most regression toward the mean would be the one that starts in psychotic relapse. The people in this pilot study represent the first group recruited. Just guessing, I would say that one third to one half had intolerable side effects with other medications (eg, TD, chronically unstable), and they were waiting for something like olanzapine to come along. Most

of the remainder are probably patients who had been in some sort of relapse, and we were looking to enhance their control of symptoms. The patients who were stable, with predominantly negative symptoms as their primary reason for switching, tended to enter the study later as practitioners became more comfortable with olanzapine and began prescribing it. Therefore, these data may overrepresent the patients who started at a more acutely ill point and who might have been expected to get better over time. Let's not forget that psychotic relapses are notoriously chronic, so the concept of regression to the mean may be less important here than in studies of treatment of affective disorders.

Dr. Aquila: What are the rehabilitation opportunities for people in your setting, and did the patients have an equal choice of those programs?

Dr. Noordsy: Three psychosocial rehabilitation approaches are used predominantly in the MHC: the individual placement support (IPS) model of vocational rehabilitation, an integrated dual-diagnosis treatment program, and the Liberman psychosocial rehabilitation modules.⁷⁻¹⁰ The IPS model is available to all patients in the center, although not everyone is actively engaged in a vocational job search at any point in time. As people become motivated, they can be referred and have access to a job counselor at any point during the study.

With the dual-diagnosis program, a case management team integrates substance abuse and mental health treatment. We also offer dual-diagnosis groups, a partial hospital, and a residential program that provides dual-diagnosis services. With the Liberman modules, not everyone was doing all of it at any point in time, but all patients had access to it and could be using those services as needed. All

patients had an equal choice of olanzapine and they had an equal choice of rehabilitation programs. Any differences in outcomes between the olanzapine-treated group and the typical antipsychotic-treated group should be the result of medication effects once we separate out any differences in the baseline point, because there is no difference in access to those programs.

Dr. Lehman: Do you anticipate any baseline selection bias in the 2 treatments, and do you have a clinical sense of those who are choosing not to go on olanzapine?

Dr. Noordsy: In general, the people who chose to stay with their typical antipsychotic were people who have had a good response to it. So if there's going to be a bias toward a better response, it would probably be toward typical antipsychotics because people who were doing poorly on them were making the decision to switch.

Dr. Lehman: You might see less change over time.

Dr. Noordsy: Right, because they may have already had substantial improvement in symptoms before they ever got to the study. Another probable predicting factor is resistance to change. People who have been on their medication for a long time may not want to think about changing; they just want everything to stay the same. They could be those who are less interested in considering psychosocial rehabilitation changes as well. Although we don't have a specific measure of motivational level, one of the psychosocial subscales relates to treatment alliance, so it may show any baseline differences.

Dr. Tunis: What variables were you able to match?

Dr. Noordsy: We intended to match diagnosis, age, and severity at entry

in the study. Severity was primarily rated on the basis of patient stability. We rated whether they were in relapse versus having very stable positive symptoms, and whether they were having medication side effects or negative symptoms. There is a 3-point rating for positive symptoms: refractory, residual, and stable positive symptoms.

During early recruitment, we only had contact with patients on atypical agents. The typical-treated group came later, as we formalized the study. By that time, it was difficult to find patients on typical therapy as so many had switched to atypicals. Therefore, we made the decision to take everyone who was found to be on typical agents and do the screening at the end (to select out those who wouldn't help us achieve the match). So we will take the 2 groups and see how closely they match at the data analyses, because we weren't able to choose those we included in the typical comparison group.

Dr. Aquila: Why are so many patients in your program on atypical agents when around the country the penetration of atypical agents is only around 45%? I think it is a great acknowledgment for you in the kind of work you're doing.

Dr. Noordsy: We have at least 75% of our patients on atypical agents. But this is partly due to the fact that these patients are in an active treatment program. We have another medication maintenance program where people who have stabilized on active treatment are simply continuing with their treatment. We didn't tap that group, although many of the patients are on typical agents. That group does not have access to the psychosocial rehabilitation approaches, and we wanted to keep that equal. The high use of atypical agents in our program is related to the treatment philosophy.

We are very focused on achieving functional outcomes. We are a private, nonprofit CMHC that is contracted with the state. The State Department of Mental Health handles managed care of the MHCs and asks questions such as "what are the vocational outcomes? what is the reduction in hospital bed days?" So, on a daily basis, we are aggressively looking at ways to improve functional outcomes. The psychiatrists work closely with the case managers and rehabilitation teams to make that happen. Each patient's case is constantly and intensely reviewed to ensure he or she is receiving the best treatment.

We don't have our service utilization data transferred into the database yet, but we anticipate seeing a reduction in costs, at least in terms of hospital bed days. We may see an increase in the use of rehabilitation services early in the 1-year study period. We may not look beyond 1 year, but it might be of interest to follow this group for 2 and 3 years to see the use of services over time. We expect there may be some associated cost savings as well.

... REFERENCES ...

1. Richelson E. Preclinical pharmacology of neuroleptics: Focus on new generation compounds. *J Clin Psychiatry* 1996;57(suppl 11):4-11.
2. Meltzer HY. An overview of the mechanism of action of clozapine. *J Clin Psychiatry* 1994;55(suppl B):47-52.
3. Fulton B, Goa KL. Olanzapine: A review of its pharmacological properties and therapeutic efficacy in the management of schizophrenia and related psychoses. *Drugs* 1997;53:281-298.
4. Beasley CM, Tollefson G, Tran P, et al. Olanzapine versus placebo and haloperidol: Acute phase results of the North American double-blind olanzapine trial. *Neuropsychopharmacology* 1996;14:111-123.
5. Noordsy DL, O'Keefe C. Effectiveness of combining atypical antipsychotics and psy-

chosocial rehabilitation in a CMHC setting. *J Clin Psychiatry* In press.

- 6.** Tran PV, Hamilton SH, Kuntz AJ, et al. Double-blind comparison of olanzapine versus risperidone in the treatment of schizophrenia and other psychotic disorders. *J Clin Psychopharmacol* 1997;17:407-418.
- 7.** Becker DR, Drake RE. Individual placement and support: A community mental health center approach to vocational rehabilitation. *Community Ment Health J* 1994;30:193-212.

8. Liberman RP, Mueser KT, Wallace CJ. Social skills training for schizophrenic individuals at risk for relapse. *Am J Psychiatry* 1986;143:523-526.

9. Drake RE, Noordsy DL. Case management for people with coexisting severe mental disorder and substance use disorder. *Psychiatr Annals* 1994;24:427-431.

10. Mueser KT, Noordsy DL. Group treatment for dually diagnosed clients. *New Directions for Mental Health Services* 1996;70:33-52.