Defining and Measuring Clinical Effectiveness in the Treatment of Schizophrenia

Henry A. Nasrallah, M.D.
Steven D. Targum, M.D.
Rajiv Tandon, M.D.
Jeffrey S. McCombs, Ph.D.
Ruth Ross, M.A.

Objectives: **Expectations in treating schizophrenia are expanding beyond just controlling psychotic symptoms to include functional recovery. This report describes an approach to define and measure the clinical effectiveness of treatment in achieving these objectives.** ***Methods:*** **A comprehensive literature review established that there is limited information about the meaning of the term "clinical effectiveness." To address this gap a consensus conference of schizophrenia researchers was held to consider the components of clinical effectiveness in real-world community practice and how these components can best be measured.** ***Results:*** **The consensus of the researchers was that effective clinical treatment is characterized by four outcome domains: symptoms of disease, treatment burden, disease burden, and health and wellness. A clinical instrument to measure these four domains was constructed: Global Outcome Assessment of Life in Schizophrenia (GOALS). In using GOALS, clinicians rate each of the four domains on a scale of 1, very much improved, to 7, very much worse. Field-testing of this instrument is planned.** ***Conclusions:*** **Effective treatment interventions that combine optimal pharmacotherapy and targeted psychosocial treatments are raising expectations about the prospects of functional recovery among patients with schizophrenia. GOALS is proposed as one tool that can provide busy clinicians with a simple, objective measure of the effectiveness and outcomes of the clinical treatment they provide to patients with schizophrenia. (*Psychiatric Services* 56:273–282, 2005)**

Advances in pharmacologic and psychosocial treatments have ushered in an era of broader stabilization, better reintegration, and more favorable outcomes for persons who have schizophrenia. The management of schizophrenia has moved beyond the mere control of psychotic symptoms to include functional recovery and social and vocational reintegration (1–4). These heightened expectations may require a change in perspective by some clinicians who may limit their treatment planning to short-term goals and management of the acute symptoms of illness.

Most clinicians agree that the primary treatment goal for patients with schizophrenia is to maximize the clinical effectiveness of the interventions employed to achieve the best possible outcome. A dearth of information exists in the literature about the meaning of the term "clinical effectiveness" as it applies to patients in real-world treatment settings. Furthermore, although standardized measures of efficacy in treating symptoms are available, there are not any generally accepted operational criteria that clinicians can use to measure the clinical effectiveness of the treatments they provide. To address this gap in knowledge, a roundtable entitled Towards Identifying Criteria for Clinical Effectiveness was set up so that a group of experts on schizophrenia who met in June 2002 could consider the following questions about the measurement of clinical effectiveness in real-world clinical practice: What do we mean by clinical effectiveness, and how does it differ from efficacy? What target outcome domains should be included in an assessment of clinical effectiveness? What tools can clinicians use to measure clinical effectiveness in those target areas? How can clinicians incorporate the concept of clinical effectiveness in their treatment planning?

Dr. Nasrallah is affiliated with the department of psychiatry, neurology, and neuroscience at the University of Cincinnati Medical Center, 231 Albert Sabin Way, P.O. Box 670559, Cincinnati, Ohio 45267-0559 (e-mail, henry.nasrallah@uc.edu). Dr. Targum is with Pharmastar in Swarthmore, Pennsylvania. Dr. Tandon is with the department of psychiatry at the University of Michigan in Ann Arbor. Dr. McCombs is with the department of pharmaceutical economics and policy at the University of Southern California in Los Angeles. Ms. Ross is with Ross Editorial in Independence, Virginia.

Outcomes considered in efficacy and effectiveness trials of schizophrenia

Efficacy trials	Effectiveness trials
Positive symptoms	Continuing symptom relief
Negative symptoms	Daily functioning
Acute safety	Ambulatory status
Depression and anxiety	Social relations
Cognition	Family relations
Tolerability	Occupational or academic functioning
Treatment adherence	Independent living and autonomy
Hospital discharge	Goal attainment, satisfaction, and possession of common objects

The purpose of this article is to propose a definition of clinical effectiveness, suggest critical outcome domains and tools to measure clinical effectiveness, and review factors that may affect these outcomes. It is hoped that the formulation presented here will help clinicians integrate these outcome domains into a new and progressive model of treatment planning that is more progressive.

Defining clinical effectiveness

Both efficacy and effectiveness studies aim to assess the impact of an intervention on outcomes, but the criteria used for these evaluations can differ markedly (4–6). Efficacy trials seek to limit variables that can influence outcomes by stipulating strict inclusion and exclusion criteria for study entry (7). Effectiveness studies, on the other hand, approximate real-world conditions by allowing multiple variables that can affect adherence with the treatment regimen and patient outcomes (8). The box on this page summarizes the differential outcomes that are often considered in efficacy and effectiveness trials.

Table 1

Operational definition of recovery from schizophreniaa

Symptom remission	Score of 4 or less (moderate symptoms) on each of the positive and negative symptom items of the Brief Psychiatric Rating Scale for two consecutive years
Vocational functioning	At least half-time of successful employment in a job in the competitive sector or successful attendance in a school for at least half-time for two consecutive years. If of retirement age (older than 60 years), participating actively in recreational, family, or volunteer activities
Independent living	Living on one's own without day-to-day supervision for money management, shopping, food preparation, laundry, personal hygiene, or need for structured recreational or vocational activities. Able to initiate own activities and schedule one's time without reminders from family or other caregivers. Although most individuals will be living on their own or with a roommate, intimate, or friend, some individuals could meet this criterion if they are living at home with family, if that is considered culturally and age appropriate. The individual may be receiving disability benefits as long as he or she is participating constructively in instrumental activities for half-time or more
Peer relationships	At least once per week, have a meeting, social event, meal, recreational activity, phone conversation, or other joint interaction with a peer outside of the family

[a] Source, Liberman and colleagues (9). Reprinted with permission. A compendium of information on the research conducted on recovery from schizophrenia can be obtained from Psychiatric Rehabilitation Consultants at dissemination@psychrehab.com, phone, 805-484-5663.

On the basis of this distinction, we propose the following operational definition of clinical effectiveness. A clinically effective treatment is characterized by sustained adherence by the patient to the prescribed treatment regimen; long-term reduction in symptoms of disease, treatment burden (side effects), and impact of the disease on the patient and members of his or her social circle; and long-term increase in healthy behaviors and restoration of wellness.

Clinical effectiveness can best be measured by examining several interrelated outcome domains that yield a broader clinical perspective on the progress of treatment.

Outcome domains for measuring clinical effectiveness

Liberman and colleagues (9) proposed operational criteria for recovery from schizophrenia that included symptom remission, improved vocational functioning, independent living, and improved peer relationships (Table 1). Although this model goes beyond symptom control as the only desirable outcome, it does not consider the side effects of treatment or the large burden that schizophrenia places on families, caregivers, and society. Consequently, we propose adding these elements to our definition of effective treatment, which includes four distinct, but interrelated, outcome domains: symptoms of disease, treatment burden, disease burden, and health and wellness. An overview of each of the four outcome domains is presented in the following sections. However, before reviewing the domains in detail it is important to briefly discuss two areas that cut across all four outcome domains: the perspective of the evaluator and adherence to treatment.

Treatment goals and expectations vary depending on the perspective of various individuals involved in the treatment (10–12). Whereas patients may be concerned about their ability to stay out of the hospital, family members may be more concerned about the patient's ability to live independently, and health care providers may be focused on improving symptoms and reducing the overall cost of care. The selected outcome

domains reflect both the patient's perspective and the perspectives of other concerned parties—for example, treatment could focus on alleviating families' social and financial burden and society's economic burden. Clearly, a clinician cannot manage all these problems alone and will need to look for additional resources to maximize the clinical effectiveness of the intervention.

As noted in the definition we proposed for clinically effective treatment, sustained patient adherence to treatment is essential for achieving optimal outcomes in all domains. For example, a treatment cannot produce symptom improvement if it is not taken appropriately, and the side effects associated with a particular medication will affect patients' willingness to take it. Improved cognition as a result of effective treatment may increase patients' understanding of the need for medication and improve adherence. Finally, if patients improve their quality of life and associate these gains with the treatment they are receiving, they are likely to be more willing to continue with that treatment.

Unfortunately, studies have found that problems with adherence are a major concern among patients with schizophrenia. McCombs and colleagues (13) reported that only 11.6 percent of patients with schizophrenia in the California Medicaid program continued to purchase antipsychotic medications consistently for one year. In a similar study Lyu and colleagues (14) estimated the one-year adherence rate to be 20 percent by using Medicaid data for four additional states. Both studies found evidence that many patients are not continuing antipsychotic drug therapies and suggest that clinicians need to do a better job in monitoring treatment adherence.

Symptoms of disease

Positive and negative symptoms. Traditionally, the positive and negative symptoms of schizophrenia have been the focus of clinical drug trials (15), and extensive empirical and research data support the clinical efficacy of pharmacotherapy for controlling these symptoms (7).

Beyond positive and negative symptoms, there is increasing awareness that cognitive function and mood and anxiety symptoms have significant effects on the outcome of long-term treatment as well. Several studies have suggested that functional outcomes associated with schizophrenia may be strongly associated with these other aspects of the illness (16–21).

Cognitive dysfunction. Evidence is accumulating that impairment in cognitive functioning is a core part of the pathology of schizophrenia (22). Cognitive difficulties may precede the onset of positive symptoms, and problems with attention, learning, verbal memory, and executive function may persist even when psychotic symptoms are in remission (16). Furthermore, cognitive deficits may cause more social and vocational disability than positive or negative symptoms and may play a role in relapse and rehospitalization (4,16,18,19,23). Alternatively, improvement in verbal memory, attention, and executive functioning has been associated with better functional and vocational outcomes (23–25).

The recent introduction of a wide range of new treatment interventions is raising expectations about long-term outcomes for patients with schizophrenia.

Mood and anxiety symptoms. High rates of depressive symptoms have been reported for 22 to 75 percent of patients who experience a first episode of schizophrenia (26) and for up to 50 percent of patients who are experiencing an acute psychotic episode (27,28). Depression may persist among a significant number of patients with schizophrenia (28) and has been associated with an increased risk of relapse, poor social adjustment, and suicide (29,30). In fact, one study found that high ratings for depression and anxiety were more strongly correlated with low ratings of subjective quality of life than any other symptoms (21).

Treatment burden

The second outcome domain, treatment burden, focuses on efforts to reduce or eliminate the adverse effects of antipsychotic treatment, such as extrapyramidal side effects, other side effects, and health risks—for example, obesity and cardiac effects (31–33).

Extrapyramidal side effects of medication. First-generation antipsychotics can cause extremely uncomfortable and disfiguring extrapyramidal side effects that often lead to poor adherence, frequent relapses, chronicity, and impaired functioning (29,31,34,35). These side effects can also increase patients' social isolation and contribute to vocational disability. Although the incidence of extrapyramidal side effects varies among the different second-generation antipsychotics, at commonly prescribed doses all are associated with a significantly lower incidence of extrapyramidal side effects than first-generation antipsychotics, which promotes better adherence and hence leads to fewer relapses (31,36).

Other adverse effects of medication. Antipsychotics can cause other types of adverse effects that can be difficult for patients to tolerate and may lead to nonadherence and poorer outcomes. Some of these side effects include weight gain, sexual dysfunction, breast engorgement, anticholinergic side effects (blurry vision, dry mouth, and constipation), drooling, sedation, and sleep disturbances (31,33). These side effects have an adverse impact on the quality of life of individuals who receive treatment. Consequently, an assessment of clini-

cal effectiveness must include consideration of a drug's side-effect profile.

Health risks related to drug treatments. Some antipsychotic medications can cause adverse effects related to weight gain, metabolic disturbances, and cardiac effects that increase medical health risks.

Although many antipsychotics are associated with weight gain, the average gain varies from one medication to another (37). In the short term, excessive weight may cause fatigue, shortness of breath, sweating, sleep disturbances, and back pain. Patients who become obese are also at increased risk of arthritis, gall bladder disease, stress incontinence, sleep apnea, major depression, hyperglycemia, hyperlipidemia, hypertension, type 2 diabetes, ischemic heart disease, stroke, and cancer (breast, endometrial, colon, and prostate) (4,33).

The rate of diabetes has been found to be two to four times greater among patients with schizophrenia than in the general population (38). This greater rate of diabetes is also found among patients with bipolar disorder (39). Furthermore, some antipsychotics affect endocrine-metabolic function, including glucose utilization, insulin resistance, and lipid levels (40–43).

Elevated prolactin levels, which are associated with some antipsychotics, may cause amenorrhea, galactorrhea, gynecomastia, decreased libido, and erectile dysfunction (44).

Cardiac function—for example, QTc interval—can be affected by some antipsychotic medications. Older patients and patients who have a history of chronic heart disease, have low calcium or magnesium (electrolyte imbalance), have a family history of a long QTc, or are taking multiple drugs are at particular risk of cardiac complications (45).

Disease burden

The third domain considers the burden of the disease on the patient; on his or her family, caregivers, and friends; on health care systems that provide treatment; and on society as a whole. This domain extends the concept of clinical effectiveness beyond the model of Liberman and colleagues (9) to consider the broader impact of illness on everyone. The wide range of burden of disease includes family stress and resulting interpersonal problems, financial pressures (treatment expenses and lost income from missed work), response to the illness by the extended social network (stigma, social relations, and work), and the impact on health care use (cost of treatment and resource allocation).

The stigma attached to schizophrenia can be widespread and can affect patients and their family. Stigma complicates patients' efforts to reintegrate socially and occupationally, even when their symptoms are in remission. Motor side effects (dyskinesias and dystonias) can add to the stigma.

This domain also encompasses costs to health care systems and to society. Westermeyer and Harrow (46) reported that 40 to 50 percent of patients with schizophrenia are rehospitalized within the first year after discharge and that overall up to 85 percent are eventually rehospitalized. Rice (47) reported that the total economic burden of schizophrenia in 1990 in the United States was $32.5 billion, of which $17.3 billion was attributed to direct medical costs.

Studies have shown that effective treatment with antipsychotics can substantially improve overall disease management for patients with schizophrenia and more than offset the higher cost of the second-generation antipsychotics because of reduced hospital bed-days, which are the largest component of direct costs (48–52).

Health and wellness

The ultimate objective of any treatment intervention is to improve the functional capacity and the quality of life of the individual. This fourth domain encompasses a wide range of outcomes: physical health, independent living (ability to handle the requirements for autonomy), vocational or educational function, social integration (family and peer relationships), instrumental competence, and quality of life.

This outcome domain incorporates three of the four categories for recovery from schizophrenia proposed by Liberman and colleagues (9): vocational functioning, independent living, and peer relationships. Unlike the previous domains, the focus of this domain is on improving outcome rather than eliminating or reducing symptoms and burden. This domain raises expectations and anticipates that the newer second-generation antipsychotics and cognitive-behavioral and psychoeducational treatments can accomplish more for the quality of life of patients with schizophrenia than previously expected.

The first step in the pursuit of health and wellness is to identify specific areas for growth, such as school, work, family, and intimate relationships. Goal setting is often difficult for patients with schizophrenia because of core negative symptoms and cognitive deficits. Furthermore, an assessment of both real and perceived barriers—that is, the individual's level of disability—that may interfere with the achievement of defined goals is also needed. Ultimately, the clinical effectiveness of a treatment intervention will be reflected in the successful achievement of these predefined social, educational, vocational, and interpersonal goals.

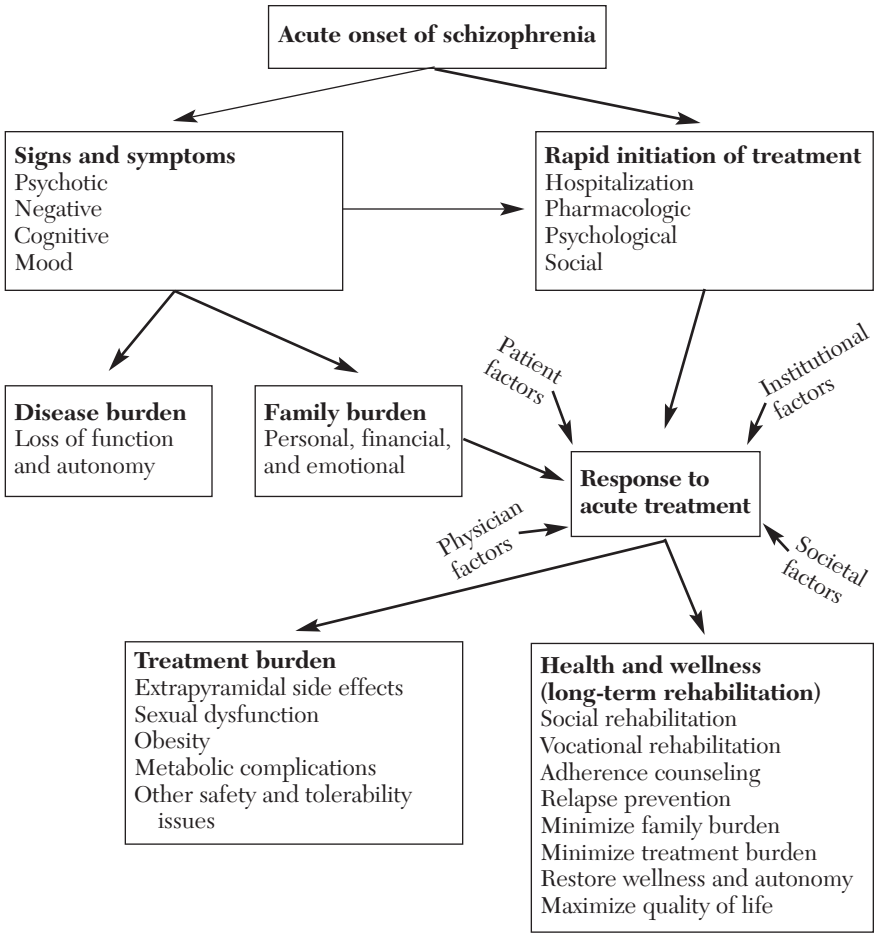
Social, educational, and vocational function. Employment is a primary goal for a majority of unemployed patients with schizophrenia (53,54). Sustained employment has been associated with reduced health care use and costs and increased levels of self-esteem and satisfaction (55–57). As noted earlier, improvement in positive symptoms appears to be less of a predictor of community functioning (independent living skills, vocational status, and quality of life), social skills, and skill acquisition (18,20) than improvement in negative symptoms and neurocognitive abilities (18,20,58–60).

Physical health. Compared with the general population, patients with schizophrenia are at an increased risk of suicide, physical illness, and early mortality (61,62). The high mortality rates are associated with unnatural death as a result of homicide and accidents, as well as cardiovascular illness and pulmonary infections (4,63,64). Smoking, poor nutrition, lack of exercise, obesity and its resultant health complications (cardiac disease and diabetes), and lack of rou-

tine primary health care are common problems in this population and are partly responsible for the high rates of cardiovascular and pulmonary illness found among patients with schizophrenia and their high rate of morbidity and mortality in comparison with the general population (63,64). Unfortunately, preventive health care for patients with serious mental illness is often inadequate (64–66). Also, as noted above, some antipsychotic medications may increase long-term health risks of problems such as obesity, metabolic problems, and cardiac disease (37,43,67–69). Patients with schizophrenia have also been found to have high rates of behaviors that put them at increased risk of hepatitis C and AIDS (70,71).

Figure 1

Relationship between the four outcome domains and impact of treatment



Measuring clinical effectiveness

Clinical effectiveness in the treatment of schizophrenia is best reflected by the progression of change in the four outcome domains from the baseline assessment. Treatment interventions have a direct impact on clinical symptoms—and thereby on disease burden—and on treatment burden. In turn, disease and treatment burden interact with other factors to influence health and wellness (Figure 1). Continuing assessment of outcomes involves short-term and long-term follow-up to track progress through the longitudinal course of illness.

The time frame for evaluating outcomes may vary with the domain that is being considered. For example, symptoms generally remit before improvements are seen in social or work functioning (72). During the first few months of treatment, clinicians focus primarily on reducing symptoms of disease while causing as few side effects as possible. Three to 12 months after initiating a treatment intervention, the focus will shift toward relapse prevention; treatment adherence; minimizing potential medical health risks; social, educational, and vocational reintegration; and patient and family satisfaction with treatment gains. Beyond a year the focus extends to longer-term goals, such as promoting full recovery, independent living, and physical health and optimizing the quality of life. Thus the first two outcome domains take a leading role early in treatment, and the third and fourth domains become increasingly important as treatment progresses.

Numerous tools can evaluate the effectiveness of schizophrenia treatment. In a real-world treatment setting clinicians need tools that are relatively quick and simple to administer, sensitive to change, and easily interpreted. Global ratings of clinical effectiveness may be the fastest and most practical type of tool for day-to-day clinical use. Beyond that, some clinicians may find it useful to employ instruments that examine specific outcome areas.

Global ratings of clinical effectiveness

The Global Assessment of Functioning (GAF) scale produces a single, composite score of psychological, social, and occupational functioning on a hypothetical continuum from mental health to severe illness (15). The GAF is a widely used reliable and valid measure of psychiatric disturbance among patients with severe mental illness (73). A modified version includes more detailed criteria and a more structured scoring system and may be particularly appropriate for use by raters with varying skills and backgrounds (74).

Alternatively, the Clinical Global Impressions (CGI) scale can be used to assess overall clinical changes in symptoms, behavior, and function (75). The subscales of the CGI include a measure of current severity and overall global change from a specific reference point (usually the beginning of treatment).

The GAF and CGI scales do not examine the progression of independent domains. For instance, symptoms of disease may progress differently from the ability to live independently.

Table 2

Clinically useful domain-specific measurement tools in the treatment of schizophrenia

Symptoms of disease	Brief Psychiatric Rating Scale (76) Positive and Negative Syndrome Scale (77) Calgary Depression Scale for Schizophrenia (79)
Treatment burden	Abnormal Involuntary Movement Scale (83) Barnes Akathisia Rating Scale (81) Simpson-Angus Extrapyramidal Side Effects Scale (82) Approaches to Schizophrenia Communication Checklists (87)
Disease burden	Chart review Interviews with patients, family members, and caregivers
Health and wellness	Physical examination and laboratory tests as appropriate Multnomah Community Ability Scale (89) Quality of Life Interview (90) Quality of Life Scale (91) Wisconsin Quality of Life Index (92) Schizophrenia Outcomes Module (93) Operational Definition of Recovery From Schizophrenia (9)

Therefore, a slightly expanded CGI tool that measures progress in each of the four domains by using a 7-point scale may offer a better view of how a specific patient is progressing. The panel of schizophrenia researchers proposed an expanded global assessment grid, called the Global Outcome Assessment of Life in Schizophrenia (GOALS) scale, which broadens the evaluation to consider each of the proposed four outcome domains. In using GOALS, clinicians rate each of the four domains on a scale of 1, very much improved, to 7, very much worse. (The instrument is available on request from the first author.) Clinicians can use specific rating instruments, as described below, in conjunction with clinical interviews of the patient and involved family members or caregivers to score the grid and use it in the treatment planning process.

Rating instruments for specific outcome domains

Table 2 suggests domain-specific measurement tools that may be appropriate for assessing symptoms of disease (first domain), treatment burden (second domain), disease burden (third domain), and health, quality of life, and health and wellness (fourth domain). Although some quantifiable methods can be used to assess the third outcome domain (for example, assessments of cost of treatment or resource use and caregiver burden scales), interviews with the patient and family may be more revealing. In fact, rating scales cannot supplant the importance or value of clinical interviews with the patient and information gathered from family members.

Symptoms of disease. Two scales are often used to measure severity and change in positive and negative symptoms. The Brief Psychiatric Rating Scale (BPRS) was developed to assess change in severity of psychopathology among patients with psychotic illness, such as schizophrenia and psychotic major depression (76). The Positive and Negative Syndrome Scale (PANSS) was developed to assess psychopathology among patients with schizophrenia, with an emphasis on positive and negative symptoms but without neglecting other general psychopathology features (77). In the recovery model of Liberman and colleagues (9) symptom remission is defined as a score of 4 or less (moderate symptoms) for two consecutive years on each of the positive and negative symptom items on the PANSS.

No consensus exists about an appropriate office-based assessment of cognitive function. Full-scale cognitive test batteries are beyond the scope of ordinary office-based practices, and it is not clear whether abbreviated tests are satisfactory (78). Clinicians may want to refer some patients for specialized neurocognitive assessments. Nevertheless, it is important to evaluate the impact of treatment interventions on cognitive function as well as the impact of cognition on other outcomes. The following queries might help in this assessment. To what extent have critical cognitive functions (for example, executive function and working and verbal memory) improved since the initiation of treatment? Have functional skills altered as a result of changes in cognitive capacity? To what extent has adherence to treatment benefited from better insight? To what extent have medications (for example, anticholinergics) adversely affected cognitive function?

Mood symptoms can be measured with the Calgary Depression Scale for Schizophrenia, a reliable and validated instrument developed specifically for assessing mood among patients with schizophrenia (79,80). Questions to assess mood symptoms might include the following: To what extent do depressive symptoms or persistent anxiety impede social, vocational, or occupational function? Are negative symptoms related to underlying depression?

Treatment burden. One clear measure of the consequences of treatment burden is adherence to drug treatment, because patients are more likely to continue taking their medication if the treatment burden is tolerable. Discontinuation of treatment also contributes to increased burden on others.

Movement disorders or extrapyramidal side effects are one of the most well recognized components of treatment burden. A number of scales are available to measure emergent or persistent extrapyramidal side effects. These include the Barnes Akathisia Rating Scale (81), the Simpson-Angus Extrapyramidal Side Effects Scale (82), and the Abnormal Involuntary Movement Scale (83).

Subjective distress related to extrapyramidal side effects may be a better predictor of treatment adherence than the commonly used extrapyramidal side effects scales (84–86). A new scale to measure side effects was recently developed by the Approaches to Schizophrenia Communication (ASC) steering group to

address these shortcomings (87). The ASC-SR is a self-report checklist to be completed by the patient, and the ASC-C is a clinician-administered version to be completed by the physician and the patient together as part of a semistructured interview (87–89). The short list of items in these questionnaires (see box on this page) are designed to help the patient better verbalize concerns about side effects and to help the treatment team gain a better understanding of what side effects are most bothersome to the patient.

Disease burden. Schizophrenia can have a tremendous impact on the patient and his or her family. Effective treatment may help alleviate some of the negative repercussions of schizophrenia on the patient's social network. An assessment of the burden of illness requires interviews with the patient and family to assess changes since the onset of the illness. The following questions are examples of how to assess this domain: Has there been a change in the level of interpersonal or family function? Has there been a change in the cost of treatment (for families or the health care system)? Has there been a change in vocational or educational function (productivity) of family members?

Health and wellness. This broad category may require several different types of assessment. Instruments to measure health and wellness among patients with severe mental illness include the Multnomah Community Ability Scale (90), the Quality of Life Interview (91), the Quality of Life Scale (92), the Wisconsin Quality of Life Index (93), and the Schizophrenia Outcomes Module (94). Although such detailed rating scales may not be suitable for use in day-to-day practice, clinicians should be alert for changes in the key areas assessed by these scales. Because this domain assesses successes rather than burdens, assessment questions need to include the following: Is there a change in the level of satisfaction with life, with work, with school? Is the patient more capable of independent living (self-management)? Is there a change in social relationships and intimacy with others? Is there a change in self-care (instrumental living function)? Is there a change in motivation and sense of purpose? Is there a change in health care practices—for example, smoking, substance abuse, and exercise?

The operational definitions of recovery proposed by Liberman and colleagues (9) may be helpful in assessing vocational functioning, independent living, and peer relationships (Table 1). However, the overall GOALS grid score for the domain of health and wellness also anticipates consideration of the impact of treatment on quality of life.

Factors affecting the assessment of clinical effectiveness

A variety of intervening factors can affect treatment outcomes for patients with schizophrenia and should be considered in the evaluation of clinical effectiveness. These factors can be grouped by whether they apply to the patient, the family, the treating physician, the health care system, or society at large (4). Certain factors can directly affect treatment outcomes (for example, substance abuse), influence expectations about outcomes (for example, age), or affect both treatment outcome and expectations (for example, educational level and available resources); they may also influence choice of treatment (for example, age or education can affect whether vocational rehabilitation is chosen).

Patient factors

Several factors may alter treatment outcomes in real-world settings: age (for example, adolescents and elderly patients), medical status and comorbid conditions, gender, substance use or abuse, cognitive capacity, treatment adherence, cultural issues (for example, race or ethnicity, educational levels, cultural expectations, belief systems, and religious background), employment status, marital status, lifestyle (for example, diet, exercise, involvement with others, and leisure pursuits), insight into illness and coping skills, and attitude toward physicians and health care systems.

Physician factors

A number of factors related to the physician have a significant influence on treatment selection and clinical outcomes and effectiveness (4): commitment to educating the patient and family about the illness, expertise with new treatments, familiarity with rehabilitation resources, ability to make appropriate referrals for rehabilitation services, and understanding that the ultimate goal of treatment extends beyond simply controlling symptoms and avoiding rehospitalization to encompass wellness and restoration of functioning.

Institutional and societal factors

Institutional factors often influence treatment effectiveness. The clinical setting (for example, a busy clinic or a private office), consumer friendliness, convenience of location, and formulary limitations on choice of available medications (4) may facilitate or impede effective treatment. The financial and personnel resources of the health care providers and the system of communication between providers will have an impact on clinical effectiveness.

A patient's ability to achieve improved social and vocational functioning can ultimately be affected by the attitude of the society in which he or she lives (4). Stigmatization of mental

ASC-C side effect checklist

1. Loss of energy or drive
2. Feeling unmotivated or numb
3. Daytime sedation or drowsiness
4. Sleeping too much
5. Muscles being too tense or stiff
6. Muscles trembling or shaking
7. Feeling restless or jittery
8. Need to move around and pace; inability to sit still
9. Trouble getting to sleep or staying asleep (insomnia)
10. Blurry vision
11. Dry mouth
12. Drooling
13. Memory and concentration problems
14. Constipation
15. Weight changes
16. Changes in sexual functioning
17. Menstrual or breast problem

The ASC scales can be obtained at www.seroquel.com/prof_asp/tools/asc_c_tool/asc-c_scales_writable.pdf

illness, job discrimination, misunderstanding about psychiatric illness and care, publicity by antipsychiatry groups, shortage of appropriate community resources, confusing and contradictory public-sector policies, and red tape can have a serious impact on clinical effectiveness, even when the illness has remitted and the patient is poised for social and vocational reintegration.

Special issues related to adolescents and older patients

Age is an important patient variable in treatment selection and outcome expectations and warrants further examination. A discussion of treatment issues related to these particular patient populations will also illustrate how all the variables described above—patient, physician, institutional, and societal—interact to affect treatment outcomes.

Adolescents. Education, social relations, and substance abuse are critical issues during the developmental phase of adolescence and may affect treatment outcomes among adolescents who become psychotic. Studies have found that early intervention among patients with schizophrenia is likely to lead to better long-term outcomes (95,96). For this reason assertive treatment intervention with adolescents is recommended to improve the long-term prognosis (95). Several studies are currently under way to investigate the effectiveness of early intervention programs for adolescents with psychosis (95,97,98).

Adolescents appear to be less tolerant than adults of the physical side effects of antipsychotic medications (for example, movement disorders); hence, second-generation antipsychotics may be especially indicated in this population (95). In selecting and evaluating the effectiveness of specific treatment approaches among adolescent patients, clinicians need to focus on the following points: developmental issues related to antipsychotic treatment, impact of treatment on educational and social functioning, comorbid substance abuse as a modifier of the effectiveness of treatment, drug tolerability and treatment adherence, and stigma encountered by young people with psychosis.

Elderly patients. Critical issues affecting elderly patients with psychosis differ markedly from those affecting adolescent patients (99). Current patterns of antipsychotic use among elderly patients fall into two distinct and nonoverlapping domains: management of psychosis among patients with chronic conditions (for example, schizophrenia) and short-term, acute symptomatic relief for specific conditions (for example, agitation in Alzheimer's disease). The settings in which care is delivered to elderly patients include the full range of ambulatory and inpatient public and private facilities, facilities in the Department of Veterans Affairs, the long-term-care sector (skilled and intermediate care), and the rapidly growing assisted-living sector, including both proprietary and not-for-profit general and disease-specific (Alzheimer's) facilities.

The elderly population is large, growing, and increasingly sophisticated. In selecting and evaluating the effectiveness of specific treatment approaches among elderly patients, clinicians need to focus on the following points: shifts in levels of care and associated cost of treatment, polypharmacy, expectations about treatment outcome, existing levels of function and disability that can affect outcome expectations, and caregiver and family burden.

Conclusions

The recent introduction of a wide range of new treatment interventions, both pharmacologic and psychosocial, is raising expectations about long-term outcomes for patients with schizophrenia. Consequently, there is more optimism about what patients with schizophrenia can achieve after remission. In this article we have proposed a working definition, given practical suggestions for measuring clinical effectiveness in a real-world setting, and offered tools that clinicians may find helpful in measuring progress in practice. GOALS allows a clinician or treatment team to evaluate the progress of treatment and to consider new strategies to maximize each of the four outcome domains. It is hoped that this formulation will help clinicians improve their ability to formulate an effective treatment process and to evaluate the impact of intervention on patients' short- and long-term outcomes. ♦

Acknowledgments

The authors thank Peter Weiden, M.D., for contributing significantly to the ideas presented in this paper. The participants in the Towards Identifying Criteria for Clinical Effectiveness roundtable were John P. Docherty, M.D., Philip P. Harvey, Ph.D., John Kane, M.D., Jeffrey S. McCombs, Ph.D., Robin M. Murray M.D., D.Sc., Henry A. Nasrallah, M.D., S. Charles Schulz, M.D., Rajiv Tandon, M.D., Steven D. Targum, M.D., and Peter J. Weiden, M.D. The authors also thank AstraZeneca Pharmaceuticals LP for providing support for the roundtable.

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