Performance Measures for Early Psychosis Treatment Services

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Objective: **This study examined the feasibility of identifying performance measures for early psychosis treatment services and obtaining consensus for these measures. The requirements of the study were that the processes used to identify measures and gain consensus should be comprehensive, be reproducible, and reflect the perspective of multiple stakeholders in Canada.** ***Methods:*** **The study was conducted in two stages. First a literature review was performed to gather articles published from 1995 to July 2002, and experts were consulted to determine performance measures. Second, a consensus-building technique, the Delphi process, was used with nominated participants from seven groups of stakeholders. Twenty stakeholders participated in three rounds of questionnaires. The degree of consensus achieved by the Delphi process was assessed by calculating the semi-interquartile range for each measure.** ***Results:*** **Seventy-three performance measures were identified from the literature review and consultation with experts. The Delphi method reduced the list to 24 measures rated as essential. This approach proved to be both feasible and cost-effective.** ***Conclusions:*** **Despite the diversity in the backgrounds of the stakeholder groups, the Delphi technique was effective in moving participants' ratings toward consensus through successive questionnaire rounds. The resulting measures reflected the interests of all stakeholders. (*Psychiatric Services* 56:1570–1582, 2005)**

Over the past decade comprehensive approaches to the early detection and treatment of psychosis have been developed (1). The goals of such early intervention services include reduction in delays for initial treatment, reduction of secondary morbidity in the postpsychotic phase of the illness, and reduction of stress among families and caregivers.

Because early intervention services are a recent development, systematic evaluation of the quality of care provided in such programs is of particular importance. Early intervention services for psychosis have been identified as complex care systems (2). They combine multiple evidence-based interventions (3) but may not themselves be specific interventions. Randomized controlled studies have not shown clear-cut benefits for specialized early intervention services for psychosis in comparison with treatment as usual (4–6). It has been argued that randomized controlled trials have limitations for evaluating socially complex services (7). Effectiveness studies may represent an alternative methodology (8). However, identifying performance measures is a necessary step toward designing effectiveness studies that can be generalized, thus creating an evidence base to evaluate whether programs such as specialized early intervention services for psychosis should become standards of care.

Performance measurement has been defined as "the use of both outcome and process measures to understand organizational performance and effect positive change to improve care" (9). Performance measures can be used to evaluate the quality of care provided and to assist health care providers in improving the quality of health care. Quality of care can be conceptualized in terms of structure, process, and outcome measures (10). Performance measures can be used to assess the quality of care at four different levels: client or clinical, service or program, system, and population (11). This article discusses performance measures appropriate for assessment at the service level. Process and outcome information

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can be used to assess quality of care when evidence suggests that the treatment provided affects patient outcome (12). For example, in the treatment of schizophrenia, extensive research has demonstrated the effectiveness of both pharmacologic and psychosocial treatments (13–15).

Quality improvement is increasingly recognized as an intrinsic part of health services delivery. In addition, funders of health care are demanding accountability and adherence to evidence-based practice. Performance measurement represents a strategy for addressing both quality improvement and accountability in health care. Ideally, performance measures should be based on evidence (16). The evidence can be derived from evidence-based guidelines or more directly from literature reviews of the evidence that supports specific measures. Even when the base of evidence is limited, guidelines and performance measures can be developed (17).

We describe an evidence-based approach to identify and select performance measures for early psychosis treatment services. The study comprised two phases. In the first, we reviewed the published and unpublished literature on performance measurement to compile an initial, comprehensive list of individual measures with potential application to early intervention programs. Published sets of performance measures specifically for early psychosis programs were not available. In the second phase of the project, additional measures were identified in the first round of the consensus process, which were narrowed and refined through the second and third round of the Delphi process, a consensus-building technique (18).

Methods

The literature review was based on two sources of information: online databases and reports from governments and professional organizations. The databases were searched for English-language articles on performance measurement published between 1995 and July 2002 and included MEDLINE, PsycINFO, PubMed, CINAHL, and HealthSTAR. The following phrases were independently used in the search: performance measure, quality indicator, process measurement, outcome measurement, and quality of care. The search was focused on measures used in health and mental health care. In addition, a Web search of online government reports and professional practice organization reports was performed. Citations in articles were reviewed, and advice was sought from experts in the field to identify additional performance measures.

The database searches yielded a total of 492 unduplicated references, with appropriateness and eligibility for inclusion in the current review determined by abstract screening. Inclusion criteria consisted of the following: the focus of the abstract was performance measurement or quality of care evaluation and either the abstract represented a review of performance measure work or the abstract presented research evidence that was based on at least one identified measure with face validity. A total of 142 references met the inclusion criteria and were individually reviewed. The overall distribution of publications by country was as follows: the United States (95 publications, or 67 percent), the United Kingdom (27 publications, or 19 percent), Canada (17 publications, or 12 percent), and Australia (three publications, or 2 percent). In total, 73 performance measures were identified in the literature, including eight with categorical definitions. These measures were classified into eight domains defined by the Canadian Institute of Health Information (19). The domains included acceptability, accessibility, appropriateness, competence, continuity, effectiveness, efficiency, and safety.

Professional and accrediting organizations have published guidelines and standards, and these were also included in our list of performance measures (20–23). In addition, a number of government-initiated or government-sponsored reports and references were identified. The U.S. National Inventory of Mental Health Quality Measures was developed by the Center for Quality Assessment and Improvement in Mental Health. The inventory is a catalogue of measures that are operationalized, evidence based, and empirically tested. It is available for use at www.cqaimh.org.

In the United States Hermann and colleagues (24) conducted a review of measures proposed for application to mental health care that were specific to schizophrenia. Forty-two process measures were identified. Twenty-five measures (60 percent) were based on research evidence that linked measure conformance with improved patient outcomes. Only 12 measures (29 percent) were fully operationalized. Few were tested for reliability or validity. The authors aptly state that these data provide a "snapshot of the status of schizophrenia process measurement amid its ongoing development."

In Australia a set of performance measures was developed to monitor the progress of the National Mental Health Strategy (25); also available is the Australian Clinical Guidelines for Early Psychosis (26).

A key innovation in the United Kingdom is the development of National Service Frameworks, which intends to set national standards and define service models for specific services or care groups, to design programs that support implementation, and to establish performance measures for use in creating benchmarks (27). The National Center for Health Outcomes Development recommended a set of 20 outcome measures for severe mental illness (28).

A number of performance measures that assessed clinical status (effectiveness domain) were found in at least two types of sources—that is, government reports, published literature, and professional practice organization reports. In addition, most of the measures within the acceptability and appropriateness domains were similarly found in at least two types of sources (78 percent and 65 percent, respectively). This finding would suggest that our searches had reached a degree of saturation.

Table 1 provides the descriptions and the sources (19–23,26,27,29–52) of the performance measures in all eight domains.

The Delphi technique has been widely used in health care research

Table 1

Performance measures for the evaluation of quality of care in early psychosis treatment services[a]

Domain and performance measure	Description	Source or developer
Acceptability		
Client satisfaction with services	Percentage of patients (with a diagnosis of schizophrenia) who reported on a standardized scale being satisfied with services and supports	Druss et al., 1999 (29); Hospital Report Research Collaborative, 2001 (30); Modern Standards and Service Models: National Service Framework for Mental Health, 1999 (27); American Psychiatric Association, 1999 (21); Royal Australian and New Zealand College of Psychiatrists, 1998 (31)
Family satisfaction with services	Percentage of family members who reported on a standardized scale being satisfied with services and supports	University of British Columbia Mental Health Evaluation and Community Consultation Unit, 2000 (32); National Service Framework for Mental Health, 1999 (27); American Psychiatric Association, 1999 (21)
Provider satisfaction with services	Percentage of staff of early psychosis treatment services who reported being satisfied with service	American Psychiatric Association, 1999 (21)
Process for handling formal complaints[b]	The existence of an explicit process for filing and resolving formal complaints	McEwan and Goldner, 2000 (33); Hospital Report, 2001 (30)
Presence of patient charter of rights[b]	Charter of rights endorsed by appropriate health authority or government body	Hospital Report, 2001 (30); McEwan and Goldner, 2000 (33)
Patient involvement in treatment decisions	Percentage of patients who receive treatment who actively participate in decisions about treatment	Mental Health Statistics Improvement Program, 1996 (34); Health Canada, 1999 (35); National Service Framework for Mental Health, 1999 (27); U.S. National Association of State Mental Health Program Directors, 2001 (36); Hospital Report, 2001 (30)
Family involvement in treatment decisions	Percentage of patients who receive treatment for schizophrenia, and are in close contact with family, whose family members and staff have met in a one-year period	Young et al., 1998 (37); Hospital Report, 2001 (30); Australian Clinical Guidelines for Early Psychosis, 2000 (26)
Patient collaboration in service delivery and planning[b]	Existence of mechanisms that aid input and participation of clients in decision making (that is, regional consumer advisory groups)	McEwan and Goldner, 2000 (33); Mental Health Statistics Improvement Program, 1996 (34)
Assurance of confidentiality[b]	Information to be kept private is safe-guarded (that is, meets requirements of current legislation)	Canadian Council on Health Services Accreditation, 2001 (22)
Accessibility		
Wait time	The time between referral to service and actual contact with mental health services	Canadian Council on Health Services Accreditation, 2001 (22); Western Canada Waitlist Project, 2003 (38)
Service reach to individuals with first episode of psychosis	Percentage of individuals who used at least one health service for first-episode psychosis	Hospital Report, 2001 (30); McEwan and Goldner, 2000 (33); American College of Mental Health Administration, 2001 (39)
Services available to homeless persons	Percentage of individuals who require assertive community treatment for homelessness and received this service	Hospital Report, 2001 (30); McEwan and Goldner, 2000 (33)
Access to psychiatrists	Percentage of individuals assigned a psychiatrist upon admission to early psychosis treatment service	Recommended by investigative team

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Table 1

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Domain and performance measure	Description	Source or developer
Assignment to primary care	Percentage of individuals with one inpatient admission or two outpatient visits for schizophrenia within a 12-month period who had face-to-face contact with a primary care physician	Popkin et al., 1998 (40); U.S. NASMPD, 2001 (36); National Service Framework for Mental Health, 1999 (27); U.K. National Institute for Clinical Excellence, 2002 (41)
Open referral system[b]	General practitioner referral not required for access to early psychosis programs	Recommended by investigative team
Barriers to service[b]	The existence of barriers to receipt of early intervention service, such as admission policies (that is, exclusionary criteria, such as language spoken, history of criminal convictions, or addictions)	U.S. NASMPD, 2001 (36); Hospital Report, 2001 (30); McEwan and Goldner, 2000 (33)
Patient perception of access	Patient perception of access assessed with patient satisfaction measures	U.S. NASMPD, 2001 (36); Mental Health Statistics Improvement Program, 1996 (34)
Median duration of untreated psychosis	The median time between onset of psychotic symptoms and first effective treatment	Larsen et al., 1998 (42); recommended by investigative team
Point of entry into mental health system	The point of first contact with the mental health system (for example, inpatient department)	Recommended by investigative team; Hospital Report, 2001 (30); McEwan and Goldner, 2000 (33)
Appropriateness		
Psychoeducation, family and patients	The percentage of patients who are receiving early psychosis treatment service and the percentage of family members who reported receiving formal education about psychosis	Popkin et al., 1998 (40); Schizophrenia Patient Outcomes Research Team, 1998 (43); recommended by investigative team; Australian Clinical Guidelines, 2000 (26)
Psychoeducation, gatekeepers	The percentage of gatekeepers (that is, family physicians, teachers, and school counselors) who reported receiving education about psychosis from early psychosis treatment services staff	Australian Clinical Guidelines, 2000 (26)
Average length of stay in acute care	Total number of inpatient days for acute care hospital patients with schizophrenia spectrum diagnoses within a fiscal year divided by the total number of acute care hospital discharges for a mental health diagnosis within a fiscal year	Hospital Report, 2001 (30); Canadian Institute of Health Information, 2001 (19)
Hospital readmission rate	Total number of acute care psychiatric admissions that occurred within 30 days of discharge divided by the total number of psychiatric discharges per year	Ashton et al., 1999 (44); National Service Framework for Mental Health, 1999 (27); McEwan and Goldner, 2000 (33); U.K. National Center for Health Outcomes Development, 1999 (45)
Acute phase medication	Percentage of adults hospitalized for an acute episode of schizophrenia who were given a prescription for antipsychotic medication upon discharge	Schizophrenia PORT, 1998 (43); Australian Clinical Guidelines, 2000 (26)
Acute phase dosage	Percentage of hospitalized adults with a schizophrenia spectrum diagnosis who received antipsychotic medication upon discharge in the range of 300 to 1,000 chlorpromazine equivalents per day for six weeks postdischarge	Schizophrenia PORT, 1998 (43)

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Domain and performance measure	Description	Source or developer
Second-generation antipsychotics	Percentage of adults with first-episode psychosis who received second-generation medication (that is, clozapine, olanzapine, risperidone, or quetiapine)	Schizophrenia PORT, 1998 (43); Australian Clinical Guidelines, 2000 (26)
Maintenance phase medication	Percentage of patients with acute symptom relief who received maintenance medication	Schizophrenia PORT, 1998 (43)
Maintenance phase dosage	Percentage of patients who received antipsychotic medication between 300 to 600 chlorpromazine equivalents per day	Schizophrenia PORT, 1998 (43)
Maintenance phase medication duration	Percentage of patients who received antipsychotic medication for acute symptoms and continued medication for the 12-month period subsequent to the stabilization of the acute episode	Schizophrenia PORT, 1998 (43)
Depot drug use for noncompliant patients	Percentage of patients who were given a prescription for oral medications and reported noncompliance who received depot maintenance	Schizophrenia PORT, 1998 (43)
Treatment-resistant psychosis	Percentage of patients who experienced significant persistent psychotic symptoms who received a trial of clozapine	Schizophrenia PORT, 1998 (43); Australian Clinical Guidelines, 2000 (26)
Adjunctive depression medication	Percentage of patients with a comorbid diagnosis of depression who received antidepressant medication	American Psychiatric Association, 1997 (23); Canadian Clinical Practice Guidelines for the Treatment of Schizophrenia, 1998 (20); Schizophrenia PORT, 1998 (43)
Adjunctive anxiety medication	Percentage of patients with persistent anxiety who received antianxiety medication	American Psychiatric Association, 1997 (23); Schizophrenia PORT, 1998 (43)
Assertive community treatment	Percentage of high service users (two or more inpatient stays or four emergency department visits in a specified year) enrolled in an assertive community treatment program	McEwan and Goldner, 2002 (46); Schizophrenia PORT, 1998 (43); American Psychiatric Association, 1999 (21); Health Canada,1999 (35)
Vocational rehabilitation	Percentage of patients who met qualifying criteria and were offered vocational rehabilitation	McEwan and Goldner, 2002 (46); Schizophrenia PORT, 1998 (43); Health Canada, 1999 (35)
Psychological treatments	Percentage of patients who received antipsychotic medication and were offered psychological treatments (support, education, and cognitive skill training)	Schizophrenia PORT, 1998 (43); Australian Clinical Guidelines, 2000 (26)
Continuity		
Case management services	Percentage of patients assigned a case manager upon admission to early psychosis treatment services	Hospital Report, 2001 (30); McEwan and Goldner, 2000 (33)
Change of therapist	Percentage of patients who experienced a change in the mental health team within a 12-month period	Popkin et al., 1998 (40)
Community follow-up after hospitalization	Percentage of patients with schizophrenia spectrum disorder diagnoses who were discharged from the hospital and received at least one psychiatry service contact within 30 days of discharge	Hospital Report, 2001 (30); McEwan and Goldner, 2000 (33)

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Domain and performance measure	Description	Source or developer
Dropout rates of patients in early psychosis treatment service	Percentage of patients who terminated treatment within a 12-month period	Popkin et al., 1998 (40)
Number of emergency department visits	Percentage of patients with four or more emergency department visits within a 12-month period	Hospital Report, 2001 (30); McEwan and Goldner, 2000 (33);
Capacity to compensate general practitioners for consults with community mental health care teams[b]	Existence of a fee item within the fee-for-service schedule that reimburses physicians for case consultation and case management activities	Hospital Report, 2001 (30); McEwan and Goldner, 2000 (33);
Documented discharge plans	Percentage of adults discharged from acute care facilities (excluding those discharged against medical advice) who have a documented discharge plan	National Service Framework for Mental Health, 1999 (27); Hospital Report, 2001 (30); McEwan and Goldner, 2000 (33)
Repatriation of patients	Percentage of patients transferred out of the region for acute or tertiary care who return to home after discharge	Hospital Report, 2001 (30); McEwan and Goldner, 2000 (33)
Single point of accountability[b]	Existence of single mental health authority at the local level that is responsible for program and fiscal accountability	Hospital Report, 2001 (30); McEwan and Goldner, 2000 (33);
Effectiveness		
Global functioning status	Percentage of patients who reported improvement or maintenance of functional status, as measured by a standardized global functioning instrument	Sederer and Dickey, 1996 (48); U.S. NASMPD, 2001 (36); Mental Health Statistics Improvement Program, 1996 (34); Hospital Report, 2001 (30);McEwan and Goldner, 2000 (33)
Positive symptoms	Percentage of patients regularly assessed for positive symptoms with a structured scale	Recommended by investigative team
Negative symptoms	Percentage of patients regularly assessed for negative symptoms with a structured scale	Recommended by investigative team
Depressive symptoms	Percentage of patients regularly assessed for depressive symptoms with a structured scale	Popkin et al., 1998 (40)
Symptom remission	Percentage of patients who achieve symptom remission (assessed with a semistructured rating scale)	U.S. NASMPD, 2001 (36)
Work and occupational functioning	Percentage of patients who became independently (competitively) employed and sustained such employment for three months	Health Canada, 1997 (47); recommended by investigative team; Consultation Unit, 2002 (49)
Educational functioning	Percentage of patients who attended an educational institution (age appropriate)	Health Canada, 1997 (47); recommended by investigative team; McEwan and Goldner, 2000 (33)
Community tenure	Aggregated days not spent in a hospital, psychiatric facility, or jail, per person per year	McEwan and Goldner, 2002 (46); McEwan and Goldner, 2000 (33); Pandiani et al., 1998 (50)
Improvement in quality of life	Percentage of patients who reported improvements in quality of life	McEwan and Goldner, 2000 (33)
Improvement in level of family burden	Percentage of family members of patients who are assessed for burden	National Service Framework for Mental Health, 1999 (27)

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Domain and performance measure	Description	Source or developer
Housing support	Percentage of patients in independent supported housing appropriate to their needs	Popkin et al., 1998 (40); Health Canada, 1999 (35); National Service Framework for Mental Health, 1999 (27); International Association of Psychosocial Rehabilitation Services, 2000 (51); U.S. NASMPD, 2001 (36)
Financial status	Percentage of patients who receive disability benefits (that is, Assured Income for Severely Handicapped)	International Association of Psychosocial Rehabilitation Services, 2000 (51); McEwan and Goldner, 2000 (33)
Assessment of issues related to substance abuse	Percentage of patients regularly assessed with a semistructured rating scale for issues related to substance abuse	American Psychiatric Association, 1997 (23); U.S. NASMPD, 2001 (36); recommended by investigative team; McEwan and Goldner, 2000 (33); Larsen et al., 1998 (42)
Patient's perception of recovery	Percentage of patients who report an improved sense of recovery	U.S. NASMPD, 2001 (36); Onken et al., 2002 (52)
Mortality rates	Standardized mortality ratio for persons with schizophrenia spectrum disorders (ratio of observed number of deaths to expected number of deaths, based on an overall population)	National Consensus Conference, 1999 (19); U.S. NASMPD, 2001 (36)
Competence		
Knowledge and application of evidence-based practice	Staff have knowledge about and are able to apply up-to-date evidence-based practice	Recommended by investigative team
Formal and continuing education of early psychosis treatment service staff[b]	The existence of a mechanism of education for mental health professional staff in early psychosis treatment services	Recommended by investigative team
Efficiency		
Mental health spending per capita for early psychosis programs	Early psychosis treatment services cost per capita	McEwan and Goldner, 2000 (33)
Staff costs not used to provide direct service to patients	Percentage of dollars spent on administration and support of full-time employees for the service of caring for the early psychosis population, to dollars spent on total full-time employees	McEwan and Goldner, 2000 (33)
Cost per patient in mental health program	Total costs divided by the total number of patients served by the early psychosis treatment service	National Service Framework for Mental Health, 1999 (27); McEwan and Goldner, 2000 (33)
Safety		
Monitoring of medication side effects	Percentage of patients taking antipsychotic medication who are evaluated for side effects	American Psychiatric Association, 1997 (23); National Service Framework for Mental Health, 1999 (27); McEwan and Goldner, 2000 (33)
Assessment of tardive dyskinesia	Percentage of patients monitored for tardive dyskinesia at six-month intervals	Schizophrenia PORT, 1998 (43)
Assessment of motor restlessness (akathisia)	Percentage of patients regularly assessed for the presence of akathisia (potential side effect of antipsychotic medication)	Young et al., 1998 (37)
Monitoring suicide rate	Percentage of suicides by patients per year	Hospital Report, 2001 (30); National Service Framework for Mental Health, 1999 (27); American College of Mental Health Administration, 2001 (39)

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Table 1

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Domain and performance measure	Description	Source or developer
Monitoring suicide attempts	Percentage of suicide attempts by patients per year	Recommended by investigative team
Monitoring homicides	Percentage of homicides by patients per year	McEwan and Goldner, 2000 (33); American College of Mental Health Administration, 2001 (39)
Monitoring homicide attempts	Percentage of homicide attempts by patients per year	Recommended by investigative team
Monitoring of medication errors	Percentage of medication prescribing errors among patients per year	U.S. NASMPD, 2001 (36); McEwan and Goldner, 2000 (33)

[a] Performance measures gathered from a literature review, reports from governments and professional organizations, and consultation with experts in the field

[b] Denotes categorical (present or absent) measures

and mental health services research, including in the identification of key components of schizophrenia care (53), the description of service models of community mental health practice (54), the characterization of relapse in schizophrenia (55), and the identification of a set of quality indicators for primary care mental health services (56).

Although historically the Delphi technique, a consensus method, has been used with a panel of experts, it has been argued that it is important to broaden the stakeholder groups to include clinicians, consumers, payers, and providers (10,57). Although experts in developing and evaluating the evidence base need to be involved in selecting performance measures, it is vital that the perspective of other stakeholders be included. For example, the organization that pays for the service will likely focus on the cost-effectiveness of care, whereas consumers will likely focus on access and acceptability. Another benefit of including multiple stakeholders is to garner support for the implementation of the services (58). In addition, the consensus technique was used to reduce the number of measures to a more manageable amount.

Consensus methods are structured facilitation techniques that explore consensus among a group by synthesizing opinions. Although a variety of consensus techniques exist (59), all sharing the common objective of synthesizing judgments when a state of uncertainty exists, the Delphi has four important features. First, it is characterized by its anonymity, thus encouraging honest opinion free from group pressure (60). This method is an advantage when both consumers and clinical experts are included, lest the experts dominate discussions. Second, iteration allows stakeholders to change their opinions in subsequent rounds. Third, controlled feedback illustrates the distribution of the group's response, in addition to the individual's previous response. Finally the Delphi technique can be used to engage participants who are separated by large distances because it can be distributed by mail or online (61). This method therefore was appropriate to use in the selection of a core set of performance measures for application to early psychosis treatment services.

The list of performance measures that resulted from the literature review was developed into a Delphi questionnaire. This questionnaire was first pilot tested and refined with three individuals who were familiar with early psychosis treatment services. Pilot testing involved individual, in-person administration of the questionnaire by a research coordinator to a patient, family member, and staff member in the local early treatment program for psychosis. The research coordinator asked these three individuals about the clarity of the instructions, definitions, and descriptions of the performance measures.

The following eight domains constitute the framework: acceptability, accessibility, appropriateness, competence, continuity, effectiveness, efficiency, and safety. Definitions were provided for each domain and for each of the five ratings on a Likert scale. Possible scores ranged from 1 to 5, with 1 representing essential and 5 unimportant.

In the next phase of the study, questionnaires were presented in three rounds to a panel of purposefully selected stakeholders. Purposive sampling is a nonprobability sampling technique in which participants are not randomly selected but instead are deliberately selected to capture a range of specified group characteristics. This form of sampling is based on the assumption that the researcher's knowledge of the population can be used to carefully select individuals to be included in the sample (62). For this particular study purposive sampling is superior to the alternatives because the stakeholders were selected on the basis of their breadth of experience and knowledge, as well as their willingness and ability to articulate their opinions. Optimal sample size in research with the Delphi technique has not been established. Research has been published that was based on samples that vary from between 10 and 50 to much larger numbers (63). Murphy and colleagues (59) asserted that a larger sample is better, concluding that as the number

Table 2

Stakeholder groups and number of participants within each round of the Delphi process

Stakeholder group	Number of participants		
	Round 1	Round 2	Round 3
Payer	4	3	2
Administrative providers	4	3	3
Clinician providers	4	4	4
National experts	3	3	3
Family physicians	2	2	2
Patients	4	3	2
Family members	4	4	4

of stakeholders increases, the reliability of "composite judgment" increases. However, these authors also stated that there is scant empirical evidence about the effect of the number of stakeholders on either the reliability or the validity of consensus processes.

The Delphi panel comprised seven stakeholder groups. It was our goal to have four participants from each of the stakeholder groups complete the Delphi process. The members of the stakeholder groups were selected from four levels: national, provincial, regional, and service. The expert group was selected at the national level and the payer group was selected from health ministry officials from the provincial government, because in Canada the provincial governments are responsible for funding and the delivery of health care. Two groups were selected at the regional level. The regional level consists of a single regional health authority, which is the health provider organization legally mandated to provide the continuum of health care services to the entire population in the region. In this case the regional health authority serves 1.2 million individuals. The two groups selected at the regional level were senior administrators and family physicians. Finally, three groups—families, consumers, and clinicians—were selected at the service level.

The seven stakeholder groups that formed the panel and the numbers of participants within each group are listed in Table 2.

During the proposal-writing stage, the primary author contacted nationally recognized experts, government representatives from the Ministry of Health and Wellness (payer group), and administrative representatives from the provider organization to explain the project and details of participation (Table 2). A list of family physicians that most frequently referred patients to the local early treatment program for psychosis was also identified. Potential family and consumer participants were identified by staff of the local early treatment program for psychosis.

The selection of the mental health care providers differed from that of the selection of the rest of the stakeholder groups. Rather than purposefully select four stakeholders, the research team invited all staff members of the local early treatment program for psychosis to participate in the Delphi technique and randomly sampled four of the seven participants' questionnaires for inclusion in our analysis.

The Delphi questionnaire was administered by the research coordinator in person to each member of the patient stakeholder group. All other stakeholders received a written questionnaire, either by e-mail or post. The stakeholders were asked to rate the importance of individual measures in the evaluation of quality of care in early psychosis programs. Each round of questionnaires included a qualitative component that offered the opportunity to provide additional feedback in the form of written comments. After round 2 and round 3, the degree of consensus achieved in the Delphi process was assessed by calculating the semi-interquartile range of the score assigned by the stakeholder for each measure (54).

The semi-interquartile range is calculated as (75th percentile–25th percentile)/2.

The level of consensus was set before data were collected. Consensus was defined as being reached when measures attracted final scores with a semi-interquartile range of .50 (absolute). Measures with final scores with a semi-interquartile range of less than .50 were interpreted as having reached strong group consensus (54).

Each round built on responses to the former round. Stakeholders were provided with a summary of the series of rounds. This summary included the feedback to each stakeholder: his or her own score on each item, the group's median ratings, and a synopsis of written comments. Stakeholders were then asked to reflect on the feedback and rerate each item in light of the new information.

In round 1, 25 stakeholders were asked to list five to ten performance measures that they believed to be important in the evaluation of the quality of care in early psychosis treatment services. The suggested performance measures were analyzed by using thematic content analysis with the Nud*ist (Non-numerical Unstructured Data Indexing Searching and Theorizing) computer software program (64). This qualitative analysis was conducted only on this first round and not on subsequent rounds and resulted in the identification of 11 potential performance measures that were not identified by the literature review.

As shown in Table 2, a total of 22 of the 25 original stakeholders participated in round 2. Three stakeholders withdrew, one from the payer group, one from the mental health administrative group, and one from the patient group. A questionnaire containing a comprehensive list of performance measures was distributed to participants. This list of 83 measures comprised the 73 items identified in the literature review plus ten additional items that were suggested in the first open-ended round of the Delphi process. Participants were asked to rate each of the measures on a 5-point Likert scale to determine

Table 3

Performance measures that stakeholders suggested in round 1 of the Delphi process as being important in the evaluation of quality of care in early psychosis treatment services

Stakeholder group	Key themes
Payer	Community follow-up; readmission rates; costs; suicide rates; participation rates of patients in early psychosis treatment services[a]; ratio of professionals to patients in early psychosis treatment services[a]
Administrative providers	Safety; patient functioning; wait lists
Clinicians	Staff competence[a]; ongoing illness education; evidence-based practice; illness education provided to family physicians, school counselors, and teachers;[a] connection of patient with community services;[a] early psychosis treatment services information disseminated to other health care professionals[a]
National experts	Access; evidence-based practice; duration of untreated psychosis; hospitalization rates; family and patient collaboration; quality of life of family members[a]
Family physicians	Confidentiality; ease of referral process for general practitioners;[a] family support; timely access to treatment
Patients	Management of medication side effects; link with support services; minimal medication costs[a]; primary health care monitoring[a]
Family members	Wait time; illness education; link with support services

[a] Themes not duplicated in the literature review

the degree to which they thought the measure was essential.

Twenty of the 22 participants from the previous round participated in round 3 (Table 2). One patient became ill and was hospitalized, and one stakeholder in the payer group withdrew from the study. Each performance measure was listed with the participant's own rating from the previous round, the median rating of the group, and the percentage of participants who responded to each rating on the Likert scale. Participants were asked to rerate each measure in light of this new information. In the event that their response was more than two points away from the group median, they were asked for elaborative comments.

Results

Although there was some thematic overlap in responses among the seven stakeholder groups in round 1, participants from different stakeholder groups valued different measures. Responses are summarized in Table 3.

Quantitative data from round 2 and round 3 were analyzed (medians, means, and semi-interquartile ranges) (65). At the end of round 3 an overall consensus was present for 69 measures (83 percent). The 24 measures rated as essential are reported in Table 4.

Table 4

Performance measures that stakeholders rated as essential in the evaluation of quality of care in early psychosis treatment services with strong group consensus[a]

Domain	Semi-interquartile range
Accessibility	
Median duration of untreated psychosis (reduction in the delays in initial treatment)[b]	0
Treatment services available to persons with first-episode psychosis	0
Formal education provided to patients and family members (reduction of stress among families and caregivers)[b]	.38
Wait time	.38
Appropriateness	
Acute phase medication	0
Maintenance phase medication	0
Hospital readmission rate	.38
Continuity	
Community follow-up after hospitalization	0
Change in principal mental health provider	0
Dropout rate of patients	.38
Documented discharge plan	.38
Effectiveness	
Global functioning status	0
Symptom remission	0
Relapse	0
Positive symptoms	.38
Negative symptoms	.38
Depressive symptoms	.38
Competence	
Evaluation component in early psychosis programs	0
Safety	
Monitoring of medication side effects	0
Assessment of tardive dyskinesia	0
Monitoring of suicides	0
Monitoring of suicide attempts	0
Assessment of motor restlessness (akathisia)	.38
Acceptability	
Confidentiality	0

[a] Semi-interquartile range of <.50 indicates consensus.
[b] Related to goals of early psychosis treatment services

Discussion

This is the first reported study to develop a set of performance measures specifically designed to evaluate early intervention services for psychosis. These measures are relevant for all mental health programs that provide services to individuals who experience a first episode of psychosis. They were not developed to evaluate only one specific model of early intervention services for psychosis; as a result, their validity does not depend on evidence from clinical trials or meta-analyses stating that one form of early psychosis is more effective than another (66). Furthermore, the stakeholder consensus process established the face validity of these performance measures (67). Publication of this set is timely because of the interest in innovative early intervention services for psychosis and the current lack of certainty about their superiority over treatment as usual (4–6). As such the measures will be particularly relevant in the United States, where there has been less emphasis on the development of specific early-intervention services for psychosis.

The responses from the open-ended question in the first round of the Delphi technique were illuminating in that results indicated that different stakeholder groups tended to value different performance measures. For example, the experts emphasized the importance of access, perhaps reflecting their knowledge about the link between duration of untreated psychosis and outcome (67); the payers emphasized readmission rates and costs; the patients emphasized management of side effects; and the families emphasized illness education.

Thirteen of the measures within the effectiveness domain were rated as essential or very important during the third round. This domain is particularly well developed and perhaps reflects the general trend in reporting outcome.

Given the diversity of the group, it is surprising that consensus was reached on a majority of measures in two rounds of the questionnaire (rounds 2 and 3). Future research could examine the reasons behind the opinion change. How participants behave between rounds and the reasons for their opinion change is an interesting psychological issue (68). Other than in the first round, we did not conduct a thematic analysis on the qualitative responses, because it was beyond the scope of this study to analyze the effect of the qualitative comments on the subsequent decision making of stakeholder groups.

This study has a number of limitations. The measures rated were based on a literature search up to July 2002. The composition of stakeholder panels used in the Delphi technique is an important factor in judging the legitimacy of the findings, and some of the groups were drawn from only one region (63). Attrition was a concern, such that the numbers in some of the stakeholders groups were not equivalent (Table 2). Because of differences in group size in round 3, the results could be biased in favor of the mental health clinician providers and the family members.

The performance measures developed in this study are relevant for all mental health programs that provide services to individuals experiencing a first episode of psychosis.

At this stage of research the reproducibility of the results of this approach is not known. However, the Delphi technique used in this study has been clearly described and can be replicated by other investigators. Although the performance measures listed in Table 4 represent consensus among the various stakeholders, some of the measures, such as knowledge and application of evidence-based practice and formal and continuing education of early psychosis treatment services staff—could be considered to be professional aspirations (56).

Finally, although the significant benefits of the Delphi process are outlined above, the process itself has limitations. The major concern is that only limited feedback was included between rounds. Also, the process does not allow for face-to-face discussion, which is allowed by consensus development conferences (69). Although other consensus techniques, such as the Nominal Group Technique RAND Appropriateness Method, have been used (69), each technique has its own strengths and weaknesses.

Conclusions

We chose not to exclude measures from the final list of 73 items at this stage. However, because the data collection and reporting burden will be too great for the full set, further reduction will be necessary to select a minimum optimal number. Reducing the number of measures will not preclude stakeholders from adding to the set if they decide that their critical needs are not being met. For example, payers might demand inclusion of measures of cost that they deem relevant, whereas experts are more likely to add process and outcome measures as the scientific literature evolves.

This large potential set of performance measures is more than sufficient to assess the goals and outcomes of early intervention services for psychosis. However, a number of processes will help guide the eventual selection. These processes include both the strength of the evidence that will link process and outcome measures and the cost and ease of data collection. Given that considerable development of information systems is currently under way, it is timely to know what it is desirable to measure in order to take advantage of the opportunity to influence routinely collected informa-

tion. A further possibility is to consider more detailed assessment of new programs and at greater cost. Once their value is established, smaller data sets are required to monitor performance. Finally, the impact of basic sociodemographic factors on key outcome measure needs to be accounted for by risk adjustment (70) in order to establish benchmarks that will allow comparisons between services (71). ♦

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