EPPIC: An Evolving System of Early Detection and Optimal Management

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Abstract

Early intervention at the onset of psychotic disorders is a highly attractive theoretical notion that is receiving increasing international interest. In practical terms, it amounts to first deciding when a psychotic disorder can be said to have commenced and then offering potentially effective treatment at the earliest possible point. A second element involves ensuring that this intervention constitutes best practice for this phase of illness and is not merely the translation of standard treatments developed for later stages and the more persistently ill subgroups of the disorder. Furthermore, it means ensuring that this best practice model is actually delivered to patients and families. The relative importance of these elements in relation to outcome has not yet been established. This article outlines a framework for preventive intervention in early psychosis, based on more than a decade of experience initially gained within a first-generation model. This experience has been followed, after a prolonged gestation, by the birth of the Early Psychosis Prevention and Intervention Centre (EPPIC), a comprehensive "real-world" model of care targeting the multiple clinical foci underpinning the preventive task. Data are reported to illustrate the topography and impact of delay in treatment in our regional setting, and the results of an initial evaluation of the EPPIC model are presented. The latter demonstrate a significant improvement in symptomatic and functional outcome when the second-generation model is contrasted with the first. The implications of these findings and future developments are discussed.

Schizophrenia Bulletin, 22(2):305–326, 1996.

> Very early schizophrenia still constitutes a relatively unexplored territory. Entry into this territory calls for new ideas on the social problems involved in bringing the early schizophrenic under treatment, or where the treatment should be carried out and in what it should consist. [Cameron 1938, p. 577]

These words, penned nearly six decades ago before the availability of neuroleptic treatment, still provide a surprisingly accurate description of the present status of clinical care for young people with an emergent psychotic disorder. They also succinctly state some of the key issues on which we must achieve consensus if we are to provide timely and optimal treatment for new generations of young people and their families affected by this group of pervasive and persistent disorders. Cameron and his contemporary Harry Stack Sullivan were prominent initial explorers of the territory of early psychosis. After an extended dormant period, a second generation of explorers has emerged, found common ground, and established substantial momentum. This article describes our own endeavors over the past decade to map the terri-

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tory, to intervene earlier, and to provide better and more humane forms of treatment and care.

Foundations of the Early Psychosis and Intervention Centre (EPPIC)

In setting out some of the principles and frameworks underpinning our clinical approach, it is important to note that these have evolved over time as part of a continuous learning process. We have endeavored to make them explicit, both as a distillate of our clinical and research experience and as a critique of concepts and practice in the wider field of psychotic disorders. This may be useful in orienting the reader to the later sections of the article.

The Preventive Framework. Prevention has been an elusive goal in psychotic disorders. Arguably, this is because the focus for our preventive thinking has been more advanced than our knowledge base, and hence overly ambitious. We still have only a vague sense of the underlying risk factors and neurobiology of the psychoses, a prerequisite for primary prevention. The tantalizing idea that we may be on the verge of a neuroscientific breakthrough that could support primary preventive strategies may have inadvertently contributed to paralysis in secondary prevention. However, secondary prevention is highly feasible, even with current levels of knowledge (McGorry 1992; McGorry and Singh 1995).

An examination of the longitudinal course of psychotic disorders and the prevailing standard of clinical care illustrates the potential scope for secondary prevention (Birchwood and MacMillan 1993). First, prolonged delays before the first effective treatment for psychosis are common (Johnstone et al. 1986; Loebel et al. 1992; Beiser et al. 1993), delays that are associated with slower and less complete recovery (e.g., Helgason 1990; Loebel et al. 1992). Second, the critical period for vulnerability to relapse and the development of disability and handicap is during the early years after onset (Birchwood and MacMillan 1993). It seems likely that these disorders are at their most severe in a biological sense in their early stages, and their disruptive and disabling effects are enhanced by the exquisitely sensitive developmental phase during which they manifest (Sullivan 1927/1994; Wyatt 1991; McGorry 1992). If this is true, there may be a particularly toxic interaction between delay in treatment and the critical period, especially in those who ultimately meet criteria for schizophrenia, where treatment delays are more prolonged (McGorry and Singh 1995). This would mean that more of the critical period would elapse before effective treatment, and indeed more psychosocial decline is apparent in this phase of schizophrenia than in other first-episode patients (Jones et al. 1993), a possible contributor to greater subsequent disability in people with this disorder. Finally, for the portion of the critical period that follows entry to treatment, there is the issue of the quality, range, and intensity of the treatment provided. Although first-episode psychosis is a highly treatment-responsive problem (Lieberman et al. 1993), our early experiences with this group of patients highlighted both the crude and insensitive ways in which standard treatments were delivered to young people during their first contact with psychiatric services and the significant gaps in expertise and resources (McGorry 1992). While some of these gaps reflected general deficiencies in the management of psychotic illness—including the use of excessive doses of neuroleptics and a variety of other iatrogenic influences—others were related to the need to develop either age- and phase-specific variants of existing clinical approaches or completely novel forms of intervention. In other words, best-practice treatment for later stages of the disorder and for more persistently ill and disabled subgroups may not constitute best practice for early psychosis. In summary, a realistic secondary preventive approach would involve strategies that first reduce the duration of untreated psychosis and second optimize the management of the disorder during the early years after detection. Such an approach could be expected to result in a more cost-effective service for young people at this stage of illness (Moscarelli et al. 1991).

The Conceptual Framework. A detailed critique has been provided elsewhere of the inadequacies of the neo-Kraepelinian diagnostic model in the setting of early psychosis (McGorry et al. 1990*a*; McGorry 1991*b*; McGorry 1995*a*), however, the issues will be briefly summarized as follows.

The neo-Kraepelinian model is derived from a relatively early stage of Kraepelin's thinking and it is curious that this stage in particular has been so tenaciously retained and more recently revived, despite serious criticism (Arieti

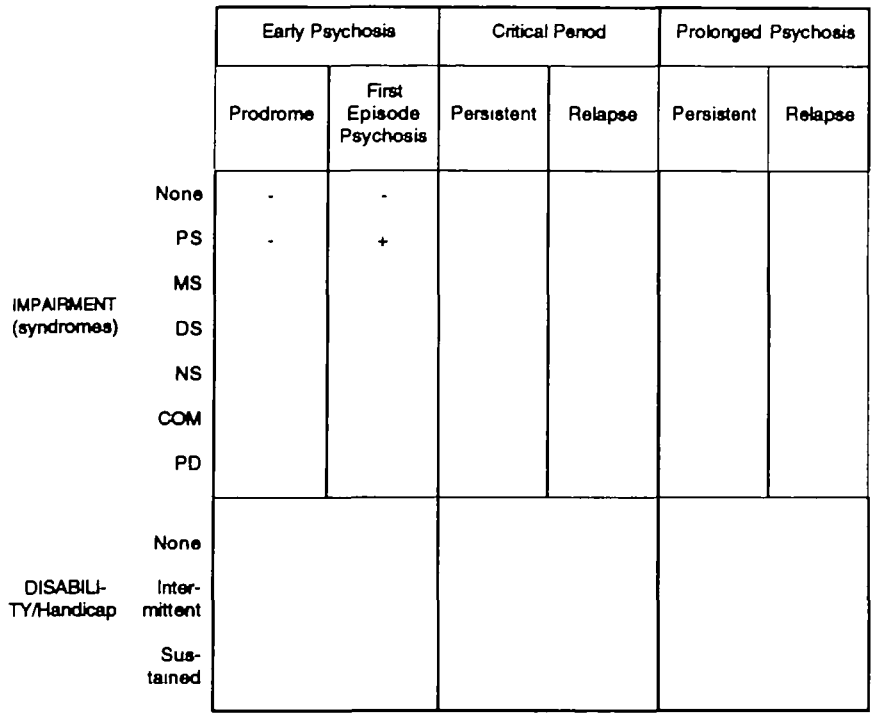
1974; Crow 1986; Boyle 1990; Bentall 1992). The syndromes of psychosis have been the subject of endless multivariate analysis, and the current consensus suggests that there are about five major syndromes (Liddle et al. 1994). None of these syndromes is unique to any of the major subcategories of psychotic disorder, and comorbidity is the rule rather than the exception, especially in early psychosis. Treatment is by no means disorder-specific, and the capacity of diagnostic subcategories—such as schizophrenia—to predict course and outcome independently of other variables—such as gender or premorbid functioning—in the individual case is relatively weak. The more specific fundamental flaw with the neo-Kraepelinian version of schizophrenia is, of course, the continued blending of syndromal diagnosis with course and duration criteria, using the latter as a proxy, validating *DSM–IV* (American Psychiatric Association 1994) criterion. This is a particular problem in early psychosis, since most of the course of the illness has yet to unfold, and relationships between symptoms and functioning are fluid, not fixed. Other factors that make the model unwieldy and unhelpful at this phase of illness include diagnostic instability (Fennig et al. 1994; McGorry 1994; Woerner et al. 1995), high comorbidity (Strakowski et al. 1993; McGorry 1994), and the reversible nature of negative symptoms (McGlashan and Fenton 1992), with correspondingly low levels of primary negative symptoms and the deficit state (Mayerhoff et al. 1994). The significance of symptoms in first-episode samples may therefore be different from that in selected chronic subsamples (McGlashan and Fenton 1992). The likelihood, then, is that the clinician's illusion (Cohen and Cohen 1984) distorts perceptions in more heterogeneous samples of functional psychosis, such as first-episode patients.

This suggests that the more general term "psychosis" would be more clinically useful in first-episode and early psychosis samples, at least for a period beyond the emergence of a psychotic disorder (McGorry 1995*a*). Such an approach does not in any way deemphasize that the patient is suffering from a usually pervasive and potentially serious psychiatric disorder. This stance derives some support from the research arena, where most groups studying first-episode samples have tended to focus on first-episode psychosis rather than first-episode schizophrenia. Clearly, it remains desirable and useful to apply operational definitions of current subcategories of psychotic disorder, both for research and communication purposes and to interact effectively with a range of other service agencies that are more familiar and comfortable with these terms. A more flexible course-based model, which we have found useful in early psychosis, is briefly described below.

Psychosis is a global and essentially simple syndrome, defined narrowly by the presence of clear-cut delusions or hallucinations or more broadly by including marked thought disorder and severe catatonic features. It may occur in association with major depression, mania, or primary negative or deficit symptoms; it is the different combinations of these syndromes with psychosis that give rise to our categories of psychotic disorder. Alternatively, one could define psychosis narrowly as the presence of delusions and hallucinations, allowing the disorganization syndrome (Liddle 1987) and catatonia to be included among the associated syndromes. Course has been embedded as a variable in constructing the existing classification system, and it may yet be helpful in designing a treatment-sensitive classification (McGorry 1995*b*). The dimension of course needs to be pulled apart from syndromes, however, and the most logical way to do this is to draw on the concept of staging as used in clinical medicine (Fava and Kellner 1993). This notion of staging, with differential transition rates from one stage to the next, has been elaborated as a prevention strategy for the early natural history of disorders (Eaton et al. 1995; Yung et al. 1996, this issue). Here we extend it to the postonset phase.

The model shown in figure 1 is a matrix of phase of illness, pattern of syndromes present during and between episodes of relapse, and the associated levels of disability and handicap. A key distinction is made between the phase of early psychosis—precursors, prodrome, and first psychotic episode—and the phase of "prolonged psychosis" (Harding 1992, personal communication). An intermediate phase can be identified in between the first episode and the period of prolonged psychosis, which has been termed the "critical period" (Birchwood and MacMillan 1993) because of its relationship to the timing of the development of disability. The transitions from one phase to another—that is, from precursors or prodrome to the first psychotic episode, from the first episode to

Figure 1. Phase-oriented classification of psychosis



PS = positive symptoms; MS = manic symptoms; DS = depressive symptoms; NS = negative symptoms; COM = other Axis I comorbidity, e.g., panic, post-traumatic stress disorder, substance abuse; PD = personality disorder.

the critical period, and from the critical period to prolonged psychosis—are key nodal processes, with only a proportion of people progressing across each node. Better understanding of the factors influencing such transitions, and hence improved predictive power, would be extremely useful. Even now, these nodes and the intervening phases seem most important for planning preventive treatment strategies. A fuller description of this model can be found elsewhere (McGorry 1995*b*).

The Developmental Framework. The period of maximum risk for the onset of a psychotic disorder, particularly in males, is the late adolescent or early adult stage (Kosky and Hardy 1992). This is a critical developmental phase in the life cycle of the individual and of the family of origin, one which involves the consolidation of identity, the process of separation and individuation from parents, crucial educational and vocational steps, and construction of an independent peer group, all of which may be important for a long time. The onset of even a relatively mild psychiatric disorder can permanently derail and truncate educational attainment (Kessler et al. 1995). When a major psychiatric disorder, such as a psychosis, strikes in this life stage, there is a potential for "personal disaster" (Raphael 1986) and disruption to all of the above developmental lines even with good treatment response. Identity formation may be seriously clouded and undermined; the family structure and evolution may be stressed and stunted; the education and career may be cut off at the knees, and, in a context of high youth unemployment, never recover; and the notoriously evanescent peer group may move on, leaving the young person struggling to recover and floundering badly. Adult psychiatric services designed for and more familiar with older cohorts of more disabled patients tend to overlook this key perspective.

A related and emergent framework is derived from the consumer perspective, which has arisen in recent years for a variety of reasons, but partly as a response to the disempowerment inherent in the role of the psychiatric patient in contemporary society and reflected in the traditional practices of mental health agencies. The consumer perspective is highly congruent with the clinical objective of ultimate illness self-management, a realistic aim in the majority of people with psychotic disorders (Strauss et al. 1987).

Models of Early Intervention

First-Generation Models of Intervention: The Aubrey Lewis Unit and the Recovery Program. In 1984 a clinical and research focus on first-episode and recent-onset psychosis began at Royal Park Hospital, then a 179-bed psychiatric hospital serving the inner city

and the northern and western suburbs of Melbourne, with a catchment population of approximately 485,000 adults. The focal point of the research program, the Aubrey Lewis Clinical Research Unit, opened as a 10-bed acute inpatient ward in October 1984 (McGorry 1985). The unit's early clinical experience with the first-episode group led to a better understanding of the particular clinical needs of these patients, the limitations of standard care, and the possibilities for a broader, more preventive approach. During 1986 an opportunity arose to expand the beds and clinical resources of the program by refocusing the work of a hospital rehabilitation unit. This "recovery" program set out to address the comprehensive psychosocial needs of patients recovering from an episode of psychosis in the recent-onset group (either first-episode or psychotic relapse occurring within 3 years of first onset of psychotic features). The program was closely linked with the Aubrey Lewis Unit, which carried out the initial assessment and acute phase treatment; patients moved to the recovery unit for the remainder of their hospital stay. Eventually, a common 21-bed unit, into which both programs were merged, was opened in 1990 by Sir Michael Shepherd (Copolov 1991). The philosophy and operation of these early models of care have been described in detail elsewhere (McGorry 1985, 1992; Copolov et al. 1989; McGorry et al. 1989, 1990*a*; Edwards et al. 1994).

The EPPIC: A Second-Generation Model of Care. EPPIC commenced operation in October 1992, seeking to provide a comprehensive community-based service to older adolescents and young adults experiencing the first onset of a psychotic illness and to provide ongoing care through the critical period. The center's comprehensive aims were to address and embrace early detection, to prevent secondary morbidity, and maintain social and occupational functioning during the early "critical period," namely the initial 2 years after entry into treatment. The initial blueprint comprised six clinical components, linked to an extensive program of research that has been a critical catalyst in developing the program (McGorry 1993; Edwards et al. 1994). The initial configuration of the program and its components will be described briefly here, since this model was in operation when the evaluation sample (see below) was treated; however, recent modifications will be referred to as well. A fuller account is provided in McGorry and Jackson (in press).

The second-generation model had two fundamental aims: first, to identify patients at the earliest stage from onset of psychosis, and second, to provide intensive phase-specific treatment for up to 2 years thereafter. A larger catchment area was necessary to justify a full range of program components, including an inpatient unit and a separate mobile team, and part of the rationale for the service also included a focus on youth and emphasized the epidemiology of psychotic disorders, particularly the patterns of age at onset. Thus, the upper age limit was reduced from 45 to 30 years, but the other first-generation inclusion criteria were retained (see below). The catchment area was virtually doubled in size to approximately 800,000 people, covering the western metropolitan region of Melbourne, an area served by two public psychiatric hospitals and five community mental health centers. Census data indicated that in 1991 the number of people within EPPIC's catchment area and age range was 208,104 (Australian Bureau of Statistics 1991), a population base that we expected to yield about 200 new cases of psychosis each year; the actual yield has been approximately 250 each year. Important demographic features of the region include a large proportion of people who were born overseas or whose parents were born overseas and a high proportion from the lowest socioeconomic status groups.

Program components. An Early Psychosis Assessment Team (EPAT) was established as a mobile team to serve as the sole entry point to EPPIC. EPAT has had an extensive community development task in addition to its assessment role, and thus it aimed to tackle the issues of delayed case detection and impeded access to appropriate treatment in a number of complementary ways. Through networking and carefully targeted community education activities, EPAT sought to raise community awareness of psychosis in young people and promote recognition and early referral. In addition, an awareness that the onset of a psychotic illness and psychiatric treatment may be traumatic for both the individual and the family led EPAT members to minimize the stress involved in what is likely to be the patient's and family's first contact with psychiatric services. This approach includes providing information and support at each stage of the assessment

phase; being available to conduct assessments in the least threatening environment, for example, in the home, school, or local doctor's office; and responding flexibly to each situation. In some cases, assessments are conducted over an extended period of time by the same team members in order to foster the development of trust to facilitate the assessment and treatment process. The twin goals of reducing treatment delay while avoiding coercive intervention and overreaction to nonurgent situations have at times been in conflict. Balancing these objectives has required a measure of skill and fine judgment.

During the first 12 months of operation EPAT responded to 460 referrals, of which 273 were clinically assessed and 183 were accepted into the EPPIC program. In the second 12 months, these figures increased, with EPAT receiving 496 referrals, directly assessing 314, and accepting 215 of these young people into the EPPIC program. Other cases entered the program through direct admission to the inpatient unit after hours (approximately 70 patients in the first 12 months, 40 in the second 12 months); EPAT assumed a 24-hour case-finding function in the third year of the program. Forty percent of the assessments took place at the young person's own home, and 21 percent at a nonpsychiatric services agency such as a school, counseling service, or general practitioner's office.

Evaluation of the referral sources reflects the effectiveness of community education and networking. In the first 6 months of operation 49.8 percent of the referrals came from nonpsychiatric sources. This had increased to 69.2 percent in the second 6 months. Family and friends were the source of 9.8 percent of referrals in the first 6 months, and this had increased to 24.5 percent in the second 6 months. The mean response time for urgent referrals to EPAT was 68 minutes in the first 12 months, reflecting EPAT's capacity to respond rapidly to potential emergency situations. The average time to reach an assessment under these circumstances reflects the large geographical area covered, with some suburbs lying over an hour's drive away from EPAT's base. The mean response time to nonurgent referrals was 3.1 days, reflecting a desire to arrange assessments at a time convenient for the young person and his or her family. Of those young people assessed by EPAT, 34 percent were initially admitted as inpatients, 31 percent managed as outpatients, and the remainder were not considered appropriate for the EPPIC program and were either referred to a more appropriate service or were subject to further assessment and monitoring in selected "doubtful" cases. As part of EPAT's objective to minimize the trauma associated with initial psychiatric contact, data on police involvement with transporting a young person to the hospital were also collected. Police transport was required in only 8.5 percent of all involuntary admissions.

Second, the outpatient case management system, a therapist case manager model, has become the centerpiece of the second-generation model. Case managers are assigned at entry, and all aspects of treatment are provided, linked, or accessed through the case manager. This model safeguards the continuity of care, which is a precious commodity and difficult to achieve. A preventive, multidisciplinary approach has been used to develop and document case management skills specific to this population and phase. EPPIC has a steady caseload of approximately 300 active patients, with 20 new cases accepted each month. Full-time case managers carry individual caseloads of approximately 40 patients, and each patient also sees a psychiatrist or senior resident regularly.

A third program component, the inpatient unit, focuses on symptom reduction and containment. Once the indications for inpatient care are no longer met, the unit facilitates rapid transition to the outpatient case management service, with mobile support if required. With the immediate assignment of the case manager at program entry, longer-term psychosocial goals can be identified early in the initial acute phase. Staff members work across the different program components to maintain continuity of care through readmissions and relapses. The inpatient unit, originally 21 beds, has recently been reduced to 14 beds, and a mobile home treatment service has assumed a bridging role to enable those patients with adequate family support and low risk of self-harm or violence to avoid the disruption of hospitalization. This component, influenced by generic changes in Australian psychiatry, has been blended with EPAT to form the Early Psychosis Assessment and Community Treatment Team (EPACT) and has enabled the length of stay to be reduced from around 25 days to 12 days. Low doses of neuroleptics are standard practice in the acute phase, and disturbed behavior is

managed by close nursing supervision; use of benzodiazepines and lithium, as "neuroleptic-sparing" agents; and minimal seclusion in an otherwise open environment.

The day program provides a range of group and individual experiences, and people are referred during the recovery phase of their initial psychotic episode. A tailored program is derived from the choices expressed by the participants, who are expected to help draft and regularly review their own individual programs. The program is a loosely linked set of open groups, a structure that enables a larger population (approximately 50 at all times) to be included, with a balance between cohesion and flexibility. The day program is based in a five-room house, which provides a secure base although many of the activities actually take place in community settings. All involvement is seen as time-limited, with participants setting goals about (and working toward) rejoining mainstream society—either where they left it or at a suitable new stage and place. Our data indicate that most participants have returned to education, work, or to other vocational rehabilitation programs. Others have maintained their functional level during contact and avoided the deterioration that might well have occurred otherwise (Francey et al. 1995).

Family work is another component of the program. The critical role of families and caretakers in supporting a young person through the first psychotic episode is emphasized, and every effort is made to include families in the treatment process, since they are also in crisis and require intervention. The needs of families for crisis support and practical education about psychosis are addressed through multifamily group interventions and individual sessions with families with support from a specialist family worker. These families have little knowledge of or experience with serious mental illness, yet a significant burden of care is placed on them. Given this level of adaptive stress, most families will find it difficult to cope, and dysfunctional patterns may emerge or, if previously present, become exaggerated. Practical advice and support, combined with the family worker's family therapy skills—if used in conjunction with an illness model that avoids any suggestion of blaming the family—can be invaluable.

Finally, the psychological challenges inherent in recovering from a psychotic illness are addressed through cognitively oriented psychotherapy for early psychosis (COPE; Jackson et al., in press). This intervention aims to help each person adapt to the onset of the psychotic illness and its effects on his or her self-concept, identity development, and self-esteem. COPE also seeks to treat secondary or comorbid disorders (McGorry et al. 1991) that may develop in the recovery phase of the initial psychotic episode.

Further developments. Additional components have been developed to address special difficulties that have become apparent since the evaluation sample described below was recruited and treated. These subprograms and emerging models, described elsewhere (McGorry and Jackson, in press), include accommodation (Pennell et al. 1995); a Treatment Resistance Early Assessment Team (TREAT) and Systematic Treatment of Persistent Positive Symptoms (STOPP; Edwards et al. 1995); Personal Assistance and Crisis Evaluation (PACE; Yung et al. 1996, this issue); general practitioner liaison; comorbid substance abuse; vocational rehabilitation; suicide prevention; and comorbid personality disorder.

In summary, the focus placed on early detection and intensive early treatment of emergent psychosis is designed to limit the damage to personal identity, social networks, and role-functioning caused by the underlying illness. The array of services offered to promote recovery and adaptation is aimed at reducing or delaying relapse and avoiding the development of secondary consequences of having experienced a psychotic episode. The remainder of this article presents a range of data illustrating the patterns of onset of psychosis in our region and the impact of the service developments on delay and outcome.

Scope for Earlier Detection in Melbourne: Charting the Landscape

Patterns of delay and impeded care similar to those found elsewhere have been identified in our own region. During the period 1989–92, we conducted a prospective followup study of 200 first-episode cases; these were carefully assessed during the acute phase and then followed for 12 months after recovery at the 3- and 12-month time points. One aim of this study was to examine the pattern of delay and its impact on outcome. Our first-generation clinical program was already relatively well known as a specialized inpa-

tient agency in the local service system, able to access and treat the overwhelming majority of cases of first-episode psychosis presenting for inpatient care at Royal Park Hospital from a strictly defined catchment area (see below). Some cases from the catchment area may have received treatment in private facilities or general hospitals; however, these agencies nearly always referred such cases to our unit for initial inpatient care, and we monitored them during the study to cross-check whether such patients were still being referred. Nevertheless, some eligible cases may have been missed (Castle et al. 1994). Approximately 75 percent of those eligible for the study (absence of organic factors, poor English, and mental retardation; age 16–45 at onset; first *treated* episode of psychosis) participated, and the two groups were not significantly different on gender, education, marital status, and country of birth. The nonparticipants, however, were nearly 5 years older on average, had a significantly shorter duration of initial hospital stay, and may have had more affective psychosis. However, the only diagnoses available for the latter group were nonoperational hospital diagnoses of uncertain reliability and validity.

For the total sample of 200, the mean age was 25.2 years; there were 122 males and 78 females; 77 percent of the sample had not yet married; and less than 20 percent had begun tertiary education. The *DSM–III–R* (American Psychiatric Association 1987) diagnostic distribution was schizophrenia 30.5 percent; schizophreniform 24.0 percent; schizoaffective 10.0 percent; delusional disorder 6.5 percent; bipolar disorder with psychotic features 13.0 percent; major depression with psychotic features 8.5 percent; brief reactive psychosis 0.5 percent; induced psychosis 0.5 percent; and psychotic disorder not otherwise specified 6.5 percent. Followup rates were 83.5 percent at 3 months and 70.0 percent at 12 months; apart from a slight excess of delusional disorder cases in those lost to followup, there were no significant differences between subjects who participated in followup and those who did not on a range of sociodemographic and clinical variables, including diagnosis, duration of untreated psychosis, and duration of psychotic symptoms in the initial episode.

The Topography of Delay. The duration of the prodromal phase, the duration of untreated psychosis, and the level of premorbid functioning were carefully assessed using the Royal Park Multidiagnostic Instrument for Psychosis (McGorry et al. 1990*b*, 1990*c*) and the Premorbid Adjustment Scale (PAS; Cannon-Spoor et al. 1982). This involved systematically interviewing the subjects and informants and carefully mapping the onset of disorder. This time-consuming methodology was originally developed for a study of the relationship between duration of illness and the complexity of the clinical features in first-episode psychosis (McGorry 1991*a*, 1994). We distinguished three phases: premorbid, prodromal, and psychotic, each of which was operationally defined.

The data reveal a skewed distribution with the majority of cases, especially in the nonschizophrenia groups experiencing relatively short delays, seen most clearly in the median figures. In the schizophrenia group, the longer delays are partly artifactual because of the influence of the 6-month criterion (particularly in contrast to the schizophreniform group). But the delays also seem to be related to other factors, possibly the difficulty in recognizing the emergent frankly psychotic features in the context of insidious onset. Table 1 reports the data in full, illustrating a highly significant difference in duration of untreated psychosis between the schizophrenia-only group and the other two groups ($p < 0.0001$). Duration of prodrome was also significantly longer in the schizophrenia-only group than in the other two ($p < 0.0001$) and significantly shorter in the schizophreniform-only group than in the other two, the latter being a largely artifactual result. The prodromal period was nearly 3 times longer in the schizophrenia group than in the nonschizophrenia group, and a higher proportion of cases manifested a prodromal phase (88.1% vs. 56.7%). The greatest scope overall for reducing delays seemed to be in the significant subsample of "outliers," which produced large standard deviations (SDs) on duration variables.

During these treatment delays, many subjects or their families have made efforts to obtain help and treatment, often with limited success (Lincoln and McGorry 1995). In a study examining the pathways to care in first-episode psychosis, Lincoln interviewed 62 individuals and their families to map the pathways and gain insight into the nature and experience of delayed treatment. The study (Lincoln and McGorry, in press) used qualitative and quan-

Table 1. Duration of pretreatment phases in pre-Early Psychosis Prevention and Intervention Centre sample (n = 200)

DSM–III–R diagnosis	Duration of prodrome (days)	Duration of untreated psychosis (days)
Total sample		
n	130	200
Mean	455.7	193.7
SD	818.8	615.6
Median	172.5	25.0
Schizophrenia only		
n	52	61
Mean	779.2	508.9
SD	1089.9	1035.0
Median	390.5	122.0
Schizophreniform only		
n	27	48
Mean	139.3	28.1
SD	273.0	33.3
Median	32.0	10.5
Nonschizophrenia/ schizophreniform		
n	51	91
Mean	293.3	69.7
SD	538.1	160.1
Median	137.0	14.0

Note.—DSM–III–R = Diagnostic and Statistical Manual of Mental Disorders, 3rd ed., revised. (American Psychiatric Association 1987). SD = standard deviation.

titative methods to examine three separate aspects of the process of delay: help-seeking, recognition, and referral. The mean number of contacts was 4.5, with a range of 1 to 17. Nearly one-third (29%) had one to three contacts, 55 percent had four to six contacts, and 16 percent had more than six help-seeking contacts. These figures are comparable, though a little lower, than those reported in the Northwick Park Study (Johnstone et al. 1986). General practitioners (GPs) appear to have a significant potential role in recognition, although this is not currently realized in practice. Thirty-five percent of initial help-seeking contacts were with a GP, although some people avoided their own GP. As many as 50 percent had contacted a GP at some point before initial effective treatment, yet this figure contrasts with the fact that only 5 percent of referrals for specialist psychiatric care came from GPs. Fifty percent of subjects were already psychotic by the time they first sought help. Early in the help-seeking process, subjects frequently sought help themselves (40% at first contact); later on, it tended to be relatives and others who would seek help on their behalf. The pathways were highly variable and experienced in different ways by each person and his or her family.

The Impact of Delay. In a fashion similar to that of Loebel et al. (1992), we examined the relationship between the duration of untreated psychosis in particular and a series of outcome measures in the sample of 200 cases described above. Because of the skewed nature of the data, Spearman correlation coefficients were computed. The duration of untreated psychosis was moderately correlated with the duration of psychotic symptoms during the first hospitalization (r = 0.33, $p < 0.001$) and with scores on the Brief Psychiatric Rating Scale (BPRS; Overall and Gorham 1962) (r = 0.26, p = 0.002) and on the Scale for the Assessment of Negative Symptoms (SANS; Andreasen 1982) (r = 0.26, p = 0.002) at 12-month followup. Moreover, the Global Assessment of Functioning score (GAF; American Psychiatric Association 1987) (r = –0.31, $p < 0.001$) and the Quality of Life Scale score (QLS; Heinrichs et al. 1984) (r = –0.38, $p < 0.001$) at 12 months were negatively correlated with the duration of untreated psychosis. When we divided the sample into those with a duration of untreated psychosis of more than 28 days (approximately half) and those with a duration of less than 28 days, we found that there were significant differences in duration of psychotic symptoms in the hospital (until remission or stabilization at reduced and stable levels) and in levels of BPRS, SANS,

GAF, and QLS scores extending across the first year of followup, commencing during the initial recovery phase and tending to strengthen by the end of the first year (table 2). Much better levels and rates of recovery were seen with the shorter duration of untreated psychosis.

Clearly, other variables, such as diagnosis, could be correlated with duration of untreated psychosis and could be seen as "explaining" the associations described. It could be that more severe illnesses with poorer outcomes might be characterized by features such as persecutory ideation or social withdrawal that might lead to delayed presentation, and we did find such symptomatic correlations in the data. To the extent this was true, the attractive notion that there could be an independent and potentially reversible contribution to outcome of delayed treatment would be illusory. While this can be clarified properly only by an intervention study, it seems logical that delay itself can be viewed as a dynamic and dependent variable with a number of contributing factors, and the course and outcome of disorder is also a complex and variable process. Multivariate analyses of the above data suggest that, depending on the order in which other variables—such as diagnosis (schizophrenia/schizophreniform; bipolar/depression; mixed), gender, and age at onset—are entered in a multiple regression (excluding four cases of delusional disorder) with the 12-month outcome variable QLS score as the dependent variable, the duration of untreated psychosis can explain approximately 15 percent of the variance. When added to duration of prodrome, it can explain approximately 24 percent. If diagnosis (using all major *DSM-III-R* categories of psychotic disorder) is entered *before* these variables, it accounts for a maximum of 8 percent of outcome variance; if *afterward,* only 1 percent. The mean QLS scores at 12 months for the major diagnostic groupings were as follows: schizophrenia/schizophreniform (n = 78) 67.9 (SD 26.1); psychotic mood disorder (n = 29) 88.5 (SD 25.7); and other (n = 26) 73.2 (SD 27.4). Bonferroni post hoc analyses revealed significant differences between the schizophrenia/schizophreniform and psychotic mood disorder groups. Surprisingly, in this age range, the age at onset and gender explained very little of the outcome variance (< 1%). These findings are consistent with those of Loebel et al. (1992) and support a prima facie

Table 2. Relationship of duration of untreated psychosis with outcome over the initial 12-month followup phase postrecovery (pre-Early Psychosis Prevention and Intervention Centre sample, n = 200)

	Duration of untreated psychosis	
	< 28 Days	> 28 Days
Duration of psychotic symptoms before remission or stabilization[1]	30.7 days (29.1)	48.3 days (38.5)
BPRS		
Entry	25.8 (10.4)	24.8 (8.2)
Recovery[2]	9.5 (6.2)	11.6 (6.2)
3 mos	9.8 (6.4)	11.8 (6.9)
12 mos[3]	8.0 (6.7)	11.6 (8.3)
SANS		
Entry	25.8 (21.0)	30.7 (20.8)
Recovery[4]	11.9 (14.1)	22.7 (18.8)
3 mos	26.0 (20.9)	29.8 (20.3)
12 mos[2]	19.1 (18.8)	28.6 (21.7)
QLS		
3 mos[2]	68.8 (24.7)	59.8 (22.5)
12 mos[3]	82.4 (26.3)	64.8 (26.7)
GAF		
Entry	25.3 (9.4)	25.5 (17.0)
3 mos	55.9 (16.0)	51.5 (6.2)
12 mos[3]	64.2 (14.4)	54.2 (14.1)

Note.—Values are mean (± standard deviation). BPRS = Brief Psychiatric Rating Scale (Overall and Gorham 1962) (18 items); SANS = Scale for the Assessment of Negative Symptoms (Andreasen 1982); QLS = Quality of Life Scale (Heinrichs et al. 1984); GAF = Global Assessment of Functioning (American Psychiatric Association 1987).

[1] $p < 0.0001$.
[2] $p < 0.05$.
[3] $p < 0.01$.
[4] $p < 0.001$.

case that duration could be a relatively independent and important influence on short-term outcome.

Initial Evaluation of the EPPIC Program

One of the explicit aims of EPPIC was to evaluate the effectiveness of the program and thus determine whether early intervention does in fact improve the outcome of young people experiencing their first episode of psychosis. While the program was not judged to have reached optimum "evaluability" by early 1993, we nonetheless felt that an initial evaluation would be appropriate.

Evaluation of outcome in mental health care is a notoriously difficult and complex task. Ruggeri and Tansella (1995) distinguish between efficacy (the potential of a treatment under experimental or "controlled" conditions) and effectiveness (the result obtained in "real world" clinical practice). They pointed out that efficacy studies are extremely difficult in clinical psychiatry because of the unavoidable intrusion of "real world" factors. These factors include the difficulty in describing, measuring, and maintaining the content and quality of multimodal interventions and in distinguishing between specific and nonspecific and effective and ineffective treatment elements. Naturalistic effectiveness studies ideally are comprehensive and measure effectiveness along several dimensions, including psychopathology, social functioning, and quality of life. The present study is a naturalistic longitudinal study with multidimensional outcome measures, aiming to evaluate the effectiveness of the EPPIC program on 12-month outcome in first-episode psychosis, in contrast to the previous model of care—which, it should be remembered, also differed to a significant extent from "standard care." Future reports will complement this study with data on consumer satisfaction and caretaker burden, as well as cost-effectiveness (Moscarelli et al. 1991).

Method.

Subjects. Subjects were compared on a range of variables to evaluate the short-term effectiveness of the EPPIC program. The first or experimental sample (n = 51) was drawn from patients presenting to EPPIC with a first episode of psychosis during the period March–October 1993. The specific inclusion criteria for EPPIC (see above) had to be strictly met—namely, age at onset for first psychotic episode between 16 and 30 and currently psychotic, as evidenced by delusions, hallucinations, marked formal thought disorder, or grossly disorganized, bizarre, or inappropriate behavior. Exclusion criteria for the evaluation sample (but not the service itself) included organic mental disorder, mental retardation, epilepsy, and inadequate command of English. These subjects consented to detailed initial assessment during the first episode and to followup on two occasions during the 12-month period following initial recovery, at 6 months and 12 months.

The 51 patients who agreed to participate in the evaluation study were not significantly different from nonparticipants on the following variables: age, sex, marital status, duration of inpatient care, ethnicity, and educational level. Sample characteristics are reported in table 3. The control sample was drawn from the sample of 200 cases described above who were treated and followed up (in this case at 3 months and 12 months) during the pre-EPPIC period 1989–92, within the first-generation model of care outlined earlier. Fifty-one control cases were selected through a precise matching procedure involving the following variables: age, sex, diagnosis, marital status, and premorbid functioning as measured by the PAS. These variables were selected because of their expected relationship with the key outcome variables of interest. The same variables were examined for the subsamples of each cohort reassessed at the 12-month followup (EPPIC n = 37; pre-EPPIC n = 34). This assessment indicated that the followup samples were representative of the initial cohorts of subjects, since no significant drift occurred on these key clinical and demographic variables. These data and other characteristics of the EPPIC and pre-EPPIC samples are reported in table 3.

Interventions. The two cohorts experienced significantly different models of intervention, and the pre-EPPIC sample constituted a historical control group. The latter got high-quality inpatient care during the initial psychotic episode and often during any early readmission. However, this was time-limited and short term, with poor continuity of care and follow-through. No proactive efforts were made at early detection or case-finding. The EPPIC sample received the above inpatient experience where this was indicated (eight cases were never admitted), but in addition they were treated

Table 3. Sample characteristics of matched Early Psychosis Prevention and Intervention Centre (EPPIC) and pre-EPPIC groups at baseline and 12-month followup

	EPPIC baseline *n* = 51	Pre-EPPIC baseline *n* = 51	EPPIC 12/12 completers *n* = 37	Pre-EPPIC 12/12 completers *n* = 34
Age (yrs), mean (SD)	22.0 (3.7)	22.4 (3.9)	22.0 (3.6)	22.1 (3.6)
Age at onset (yrs), mean (SD)	21.5 (3.7)	21.7 (4.2)	21.4 (3.5)	21.1 (3.9)
Gender, M/F	33/18	33/18	21/15	21/13
Diagnosis, %				
Sz	45.1	45.1	41.7	50.0
Sf	11.8	11.8	16.7	14.7
Sa	9.8	9.8	13.9	11.8
Del	2.0	2.0	2.8	0
Bip	13.7	13.7	11.1	11.8
Dep	11.8	11.8	11.1	11.8
PsyNOS	5.9	5.9	2.8	0
Marital status, %				
Never married	88.2	84.3	86.1	85.3
Separated	2.0	2.0	2.8	
Married	9.8	13.7	11.1	14.7
PAS index, mean (SD)	11.8 (8.1)	11.9 (7.5)	11.8 (8.6)	12.5 (8.2)

Note.—SD = standard deviation; M = male; F = female; Bip = bipolar disorder; Del = delusional disorder; Dep = depression; PsyNOS = psychotic disorder not otherwise specified; Sa = schizoaffective disorder; Sf = schizophreniform disorder; Sz = schizophrenia. PAS index is a subset of items from the Premorbid Adjustment Scale (Cannon-Spoor et al. 1982) general subscale. Some items that were potentially confounded with onset of disorder or not applicable to the full age range of the sample were removed.

with relatively better continuity of care and offered a broader range of services over the full period of followup as described above.

Assessment protocols. A range of assessments were completed on all study participants at four different time points: at entry to the programs, at recovery or stabilization of psychotic symptoms, at 3 months postrecovery (pre-EPPIC) or 6 months postrecovery (EPPIC), and at 12 months postrecovery.

Although there were some differences between the two studies in the measures used, largely due to the advent of the COPE evaluation project (Jackson et al. 1995), a common core of instruments was used in both samples. All subjects were assessed during the initial episode using the Royal Park Multidiagnostic Instrument for Psychosis, a comprehensive diagnostic instrument involving structured interviews completed with patients and informants (McGorry et al. 1990*b*, 1990*c*) and, wherever possible, the PAS.

The BPRS and the SANS were completed at all assessment time points. At the 3- or 6-month and 12-month followup points only, the QLS was completed. The QLS is a 21-item semistructured interview designed to assess deficit syndrome symptoms in schizophrenia; in fact, it represents an excellent broad spectrum measure of multiple outcome domains in this population. A treatment questionnaire was also completed at these followups. This is a structured interview developed by the researchers to assess the type and quantity of followup care being received, as well as any relapses or hospitalizations the subject may have had in the time between interviews. Medication dosage, compliance, and any alternative treatment or therapies the patient may be engaged in were also assessed.

Interrater reliability was established for all the above measures (e.g., McGorry et al. 1988, 1990*c*) and monitored throughout the study. There was some change in interviewers during the period in question, but extensive training and calibration of ratings minimized the impact, and two raters were involved in collecting the data in both pre-EPPIC and EPPIC samples. Mean kappas for baseline and followup ratings were almost exclusively greater than 0.7; for example, the kappa value for the diagnosis of schizophrenia was 0.92.

Results. The outcomes of the two samples were compared on a range of variables. These variables may be grouped from proximal to distal as process or intervening variables, symptomatic outcome variables, and functional outcome

variables. The results are reported in tables 4 and 5. Finally, some broader outcomes covered by more qualitative research carried out during the same period are reported in a general way.

Process variables. The duration of untreated psychosis in the two matched samples is reported in table 4. Since this variable is correlated with others that have been constrained by matching, and because we are also examining it as a dependent variable through which to evaluate the effectiveness of the early detection efforts of the EPAT team, we have also included the data on duration from the most complete pre-EPPIC (n = 200) and EPPIC (n = 145) samples available. For the latter unmatched samples, the duration parameters have also been presented separately for the schizophrenia and nonschizophrenia diagnostic subgroups. This was not feasible for the matched samples because of the relatively small sample size. Data for the period 1986–89 were similar to those for the 1989–92 period.

Table 4. Duration of untreated psychosis (DUP) in pre-Early Psychosis Prevention and Intervention Centre (EPPIC) and EPPIC samples, days

	Evaluation samples		Unmatched samples	
DUP	EPPIC n = 51	pre-EPPIC n = 51	EPPIC n = 145	pre-EPPIC n = 200
All diagnoses				
Mean	191.4	236.6	158.9	193.7
SD	483.6	702.7	346.5	615.6
Median	52.0	30.0	42.0	25.0
Schizophrenia, n = 55				
Mean	—	—	348.8	508.9
SD	—	—	504.3	1035.0
Median	—	—	184.0	122.0
Nonschizophrenia, n = 90				
Mean	—	—	42.9	55.3
SD	—	—	63.9	132.2
Median	—	—	16.0	14.0

Note.—SD = standard deviation.

The results reveal an apparent trend for the duration of untreated psychosis to be reduced in the EPPIC sample, a trend that is stronger in the schizophrenia subgroup. This appears to amount to a reduction of approximately 1 month on average in the total sample and 5 months in the schizophrenia subgroup. In reality, the numerical change is accounted for by a reduction in the variability of the sample, which took place through a major reduction in the number of outliers with extremely long durations of untreated psychosis. It appears that the EPAT team's efforts may have led to the earlier identification and entry into treatment of many more of this subsample of cases. Although this seems to be a clinically important development, support is not forthcoming from tests of statistical significance. To use these tests, the data, which are highly skewed, were log transformed, minimizing the influence of outliers. Nonparametric methods were used as an alternative approach (Mann-Whitney U test). The result was a significantly longer duration in the EPPIC sample, which is counterintuitive given the original raw data. Removal of the "outliers" influence, the possible existence of a floor effect, and difficulty in interpreting the overlap of the onset and delay phases with the sampling periods all may be contributing to the confusing effect.

Table 5 includes the frequency of admissions and number of bed-days used in the two samples of patients over the first 12 months after program entry. The EPPIC sample experienced significantly fewer admissions ($p < 0.01$), mainly by avoiding the initial inpatient stay in eight cases. Also, twice as many pre-EPPIC patients required more than three admissions. The eight EPPIC cases who avoided admission probably would have been admitted in the pre-EPPIC period. Further, with closer monitoring of outpatients through the outpatient case management system, more relapses may have been detected, enhancing the treated prevalence of acute episodes. The effect on readmission rates is difficult to determine, however, since early detection of relapse may have averted readmission in an unknown number of cases.

Table 5. Process, symptomatic, and functional outcome variables during first 12 months of treatment

Variable	Pre-EPPIC	EPPIC	*p*
Frequency of admission			
0	0 (0.0%)	8 (15.7%)	
1–2	42 (82.4%)	39 (76.5%)	< 0.01
> 3	9 (17.6%)	4 (7.8%)	
Inpatient bed days			
Total	79.5 (61.6)	42.0 (31.3)	< 0.001
Excluding first admission	25.4 (45.1)	9.6 (20.3)	0.026
Neuroleptic dosage in chlorpromazine equivalents			
Maximum initial dosage	776.9 (640.7)	354.0 (217.6)	< 0.001
Cases on neuroleptics only			
On discharge	398.9 (266.8)	267.2 (179.0)	0.016
At 3/6 months	346.4 (266.9)	235.0 (133.6)	0.058
At 12 months	388.7 (295.6)	215.7 (143.3)	0.012
All cases			
On discharge	350.3 (282.4)	253.5 (184.2)	0.072
At 3/6 months	247.4 (274.8)	117.5 (151.2)	0.010
At 12 months	306.3 (307.1)	122.4 (152.1)	0.003
BPRS			
Entry	25.5 (7.5)	27.5 (8.1)	NS
Recovery	9.8 (6.1)	11.5 (5.6)	NS
3/6 months	11.2 (6.9)	8.1 (6.0)	0.031
12 months	11.4 (9.0)	10.7 (6.4)	NS
SANS			
Entry	29.7 (19.2)	34.5 (24.5)	NS
Recovery	15.3 (15.7)	26.5 (20.6)	0.003
3/6 months	27.1 (17.9)	17.7 (18.5)	0.024
12 months	27.8 (21.6)	18.8 (18.1)	NS
QLS			
Entry	—	—	
Recovery	—	—	
3/6 months	66.0 (21.9)	82.7 (24.2)	< 0.001
12 months	68.8 (27.3)	84.7 (22.6)	0.009

Note.—EPPIC = Early Psychosis Prevention and Intervention Centre. Values are mean (standard deviation). BPRS = Brief Psychiatric Rating Scale (Overall and Gorham 1962); SANS = Scale for the Assessment of Negative Symptoms (Andreasen 1982); QLS = Quality of Life Scale (Heinrichs et al. 1984). NS = not significant.

As a precursor to a more formal economic evaluation of the model, we also report the actual number of bed-days in the two samples for the 12-month period after entry to treatment, including and excluding the initial admission. Highly significant differences were found. In a similar vein, the duration of the initial admission was significantly shorter in the EPPIC (n = 41) sample (mean 39.5, SD = 21.8 days) compared with the pre-EPPIC (n = 51) sample (mean 54.1, SD = 37.1 days) for those cases admitted during the initial episode (p = 0.021). Reductions of this magnitude represent significant po-

tential cost savings, provided the outpatient costs of the EPPIC program do not turn out to be substantially greater than standard outpatient care. Further reductions in the length of stay have since occurred.

Adherence to treatment was assessed through the treatment questionnaire and was rated using a number of information sources, namely the subject, the case record or case manager, and (where indicated) a relative or informant. Adherence was very good, and no significant differences were found when the 3-month (pre-EPPIC) and 6-month (EPPIC) followup samples were compared. At 12 months, there was again a surprisingly good level of adherence overall in both samples.

Data on neuroleptic dosage (table 5) show a substantial reduction in both acute and postacute levels of neuroleptic dosage. The data are presented both for the total sample (including those neuroleptic-free at followup) and separately for those actually receiving neuroleptic medication.

These data reveal significantly lower levels of neuroleptic intake overall, explained partly by fewer cases being prescribed neuroleptics throughout the full 12 months of followup (only half the sample was still receiving neuroleptics at 6 months) and partly by a low-dose prescribing policy, which has been reduced further since this sample was treated, influenced by the study of McEvoy and colleagues (1991). These data should be considered in relation to levels of symptomatic outcome. The lower percentage of patients on continuing medication, particularly neuroleptics, is a consequence of a number of factors. First, less than half the sample initially met criteria for schizophrenia, and more rapid and complete resolution is relatively more likely in this group. Second, in a cohort of young people with no prior exposure to mental health services, relatively good or complete recovery, and significant levels of (partially adaptive) denial, a flight into health is common. Many of these young people are determined to cease medication, yet they are often willing to remain in some degree of clinical contact. Our preference is generally to go along with this (unless there are contraindications) rather than to attempt to enforce adherence (McGorry 1995*a*), although this is often necessary in the initial acute phase. This is in keeping with the preventive, developmental, and consumer-oriented approach outlined above. Furthermore, we still are poor at predicting the subgroup that will never relapse, yet we believe it is important to give them an opportunity to be identified relatively early. We nevertheless aim for at least 6 to 12 months of neuroleptic therapy in patients meeting criteria for schizophrenia or schizophreniform disorder and are most reluctant to agree to cessation of medication if positive symptoms persist, even at attenuated levels. This is based on the admittedly limited literature in this area and our clinical experience to date. A range of factors influence the targeted range of duration of therapy. It also seems wise to continue treatment for a period after remission to allow for consolidation. In more typically affective psychoses, a similar duration of therapy is aimed for, though perhaps the 6- to 9-month timeframe is more common.

Symptomatic outcome variables. These data (table 5) show that levels of severe psychopathology, as reflected in the total BPRS score, are comparable during the first 12 months in the two samples. Levels of negative symptoms, however, follow a different pattern, with significantly higher levels in the EPPIC sample at the initial stabilization or recovery point but significantly lower levels during subsequent followup. The table reports the mean total score (including global scores); however, similar results were obtained using global scores alone. Beck Depression Inventory (BDI; Beck et al. 1961) scores were also measured; they were low and not significantly different in the two samples at all four measurement points. These data are interesting since they illustrate that good remission and low subsequent levels of positive symptoms are possible with lower doses of neuroleptics (cf. Baldessarini et al. 1995). The latter strategy, combined with intensive psychosocial management, is also associated with sustained lower levels of negative symptoms during the followup period. We remain uncertain whether this reduction involves "primary" or "secondary" negative symptoms, although the existence of very similar and low levels of depression in each sample suggests that the reduction in negative symptoms is not due to less depression or demoralization per se. The reduced doses and duration of neuroleptic therapy could, however, be a factor. This issue is the focus of ongoing research.

Finally, the symptomatology associated with post-traumatic stress disorder (PTSD) was measured using the Structured Interview for

PTSD (Davidson et al. 1989) in the EPPIC sample and contrasted with levels found in the pre-EPPIC sample. These data will be reported in more detail elsewhere, but dimensionally[1] at least, significantly lower levels of these symptoms were reported, even though levels were relatively low in both samples. The data were as follows at the 3- or 6-month point: EPPIC sample, mean 6.7 (SD = 5.3); pre-EPPIC sample, mean 10.6 (SD = 7.7, $p = 0.029$). However, the finding was less clear-cut beyond the matched samples, with few differences found. Use of this measure in our other research samples resulted in means of 24.4 (SD = 14.6) in a refugee trauma group ($n = 69$) and 32.1 (SD = 13.5) in a group of torture survivors ($n = 56$) (Thompson, personal communication, 1995).

Functional outcome variables. The QLS scores during the 3- or 6-month followup phase and at 12 months for the two samples reflect a significant and clinically important advantage for the EPPIC samples, amounting to a 23 to 25 percent functional improvement (table 5). The QLS was originally devised to measure aspects of deficit syndrome in schizophrenia. One of the subscales, "intrapsychic foundations"—which includes items such as sense of purpose, motivation, curiosity, anhedonia, and emotional interaction—particularly aims to tap into what McGlashan (personal communication, 1995) has called "deficit processes." We found highly significant differences between the two samples on this subscale at the 3- or 6-month followup ($p = 0.005$) and the 12-month followup ($p = 0.003$). Apart from role functioning, the differences on the other subscales of the QLS were less dramatic, suggesting that there may have been a direct effect on primary negative symptoms and "deficit processes." This is a crucial focus for further research.

Mixed-effects regression models (sometimes also referred to as random regression models) were fitted to the BPRS, SANS, and QLS data over the different time periods. This analysis confirmed the findings reported in table 5 and demonstrated significant differences between the samples on these outcome variables at the various followup points. Further details are available on request.

Other outcome variables. During the study period (1993–94), a consumer satisfaction survey was carried out to sample opinions among consumers and caretakers from both pre-EPPIC and EPPIC samples (Lincoln 1994). The results indicated some improvements in satisfaction among consumers and caretakers, especially in relation to family support; however, a number of areas for potential further improvements were highlighted, notably the perceived and actual safety of female inpatients in a unit where males predominate, the need for better continuity of care, and levels of boredom and frustration among involuntary inpatients.

Suicide rates among recent-onset patients are disturbingly high (Meltzer and Okayli, 1995) and yet are difficult to measure, even in carefully defined samples. To date, over three calendar years, we know of seven definite suicides among our patients, two unexplained deaths (no evidence of suicide at post mortem), and one violent death (shot by police). Four suicide attempts narrowly failed. This pattern has occurred in the context of an inception rate of 250 per annum, provision of followup care for up to 2 years, and a standing active caseload of approximately 300. In the pre-EPPIC era (1989–92), to the best of our knowledge, at least six cases from the pre-EPPIC 12-month followup sample ($n = 140$) had committed suicide within 2 years of entry to treatment. This seems to indicate a substantial reduction in early suicides, although rates are difficult to specify accurately. We are currently attempting to quantify this critical variable more accurately, since in Australia as elsewhere, there is great concern at the dramatic increase in the general suicide rate among males ages 15–24 over the past 15 years (Commonwealth Department of Human Services and Health 1995). Clearly, there may be a toxic interaction of risk factors here and it will be important to monitor mortality carefully from this and other sources.

Discussion—A Stitch in Time ...?

This article describes the conceptual framework underpinning a comprehensive and relatively large-scale "real world" clinical service that is attempting to deliver secondary prevention of psychotic disorders in young people. The EPPIC program has evolved from

[1]The global level of PTSD symptoms rather than categorical presence or absence of caseness due to fulfillment of the *DSM* criteria; the latter is often quixotically determined by a particular combination of lack of features.

the first-generation model, which provided inpatient service only, to a comprehensive multicomponent program with skilled case management at its core. The model is informed by the recognition that the onset of psychotic illness is a potentially catastrophic event in a young person's life, with wide-reaching effects on the family, the peer network, and educational and vocational attainment (Kessler et al. 1995). This event or process presents a significant opportunity for preventive work to minimize its negative impact, as well as a measure of reversible secondary disability, maximizing recovery. It is hoped that by attending to the specific needs of this population, a more appropriate and effective service has been developed that will continue to evolve and ultimately lead to better short- and long-term symptomatic and functional outcomes for these young people. The twin strategies involved can be summarized as early case detection and intensive biopsychosocial treatment for a sustained period early in the course of disorder. The aim is to reduce the level of both primary and secondary morbidity associated with these potentially devastating illnesses, the effects of which are magnified through the timing of their peak age at onset during an exquisitely sensitive developmental phase. What can we conclude from the data presented?

First, the methodology of the evaluation study is by no means perfect, and it represents a preliminary naturalistic or "real world" study of effectiveness rather than of efficacy (Ruggeri and Tansella 1995). On the other hand, the study evaluates the work of a busy frontline clinical service, rather than a "boutique" style of research intervention. Hence, it may have more widespread applicability. However, the control group was not a concurrent randomly allocated sample but a historical control group, with all the potential pitfalls associated with this method. On the other hand, the controls were carefully matched on key variables related to outcome, and the results clearly favored the experimental or EPPIC sample, even though the historical controls clearly were exposed to a clinical model that was superior to even concurrent standard approaches to the care of first-episode psychosis patients in mainstream psychiatric services. This factor probably leads to an underestimation of the degree of advantage of the EPPIC model over care of first-episode cases in standard services, as does the timing of the study so early in the development of the program. One criticism of the use of historical controls is that generic and often unmeasured changes in the wider service can covertly lead to differences in outcome between controls and experimental subjects. Significant changes were beginning to occur in the general psychiatric service system in Victoria during the period 1989–93. But when we accessed the standard information system (PRISM) to monitor changes in mean duration of inpatient stay in acute units—a potentially sensitive indicator of the local changes that involved an increasing shift to community care of acute episodes—this variable was found to be highly stable throughout the period under consideration. We had considered, for example, whether the reduction in inpatient bed-days from the control (pre-EPPIC) sample to the experimental (EPPIC) sample might have been part of a more general phenomenon; however, there was no evidence that such was the case. Similarly, we could find no evidence for a generalized reduction in neuroleptic dosage beyond the EPPIC program—a stability that has been reported elsewhere (Baldessarini et al. 1995). The finding that functional outcomes are better with reduced neuroleptic dosages (and duration of treatment)—without any increase in positive symptomatology during followup or use of inpatient resources and with a reduced level of negative symptoms—should be of great practical importance.

Second, our conclusions must remain cautious at this stage, since the followup period is short. We have no firm data yet on the outcomes for these cases at 2 years or beyond, although this followup is in progress. Nevertheless, the significant reduction in negative symptoms and in the symptoms within the QLS linked to deficit processes are especially encouraging. At least some of this reduction may be due to lower levels of secondary negative symptoms linked to lower levels of neuroleptic intake; however, it is also possible that a more fundamental psychobiological change has occurred. If so, it may reflect the plasticity in relation to these deficit processes noted by McGlashan (personal communication, 1995). This question is now the subject of more detailed inquiry.

Third, although there has been some impact on reducing the duration of untreated psychosis, the results are not easy to interpret, and there is room for improvement. In addition, our approach to

secondary prevention has been of the "omnibus" variety, in which we have targeted delay *and* delivered more comprehensive and multimodal early treatment at the same time. It is therefore difficult to separate and apportion the relative improvements in outcome to different aspects of the model of intervention. This is likely to be more feasible by using some of the designs conceived and articulated by McGlashan and Johannessen (1996, this issue), and it will be practical in the near future in our service setting, as well as in Norway. At this stage, however, we believe that the improved short-term outcomes we have demonstrated derive largely from more phase-specific and intensive treatment than from earlier provision of treatment, since the latter does not seem to have occurred to a widespread extent apart from a subsample of "outliers." We regard the decade-long gestation period during which we were able to develop substantial clinical experience with this phase of illness as critical. Rather than merely applying standard "accepted" treatment at an earlier phase of disorder, we have actually modified treatments for use at this phase and developed some new clinical expertise in both a process and content sense, moving toward a best-practice model. This is a contention we are formally testing in a series of studies in progress, dismantling and evaluating the separate components of the intervention package. We expect that global outcomes will improve further, since the program is functioning in a more integrated and sophisticated manner than when the evaluation sample reported here was treated.

Future directions include the better definition of optimal psychopharmacological strategies and sequences in the first episode; the early identification of treatment-resistance and the development of an integrated psychopharmacological and psychosocial response to this key phenomenon; and the pushing back of the frontiers of early psychosis into the prepsychotic phase (McGorry et al. 1995), as described more fully elsewhere (Yung et al. 1996, this issue). We are also conducting an evaluation study with concurrent controls and a formal cost-effectiveness study of the model. Finally, if the EPPIC model is shown to be clearly cost-effective in a sustained way, then the question of whether and how it can be replicated must be addressed more systematically.

The early intervention paradigm developed within EPPIC may also have much wider application for other potentially serious mental illnesses that emerge during adolescence and early adult life. These include mood disorders, eating disorders, the more severe personality disorders, and some disabling anxiety disorders such as obsessive-compulsive disorder. The model would require modification for some of these disorders where the prevalence differs substantially from psychosis; however, the adage "a stitch in time saves nine" may be equally applicable. The interpretation of proverbs was once a time-honored assessment tool in schizophrenia. Perhaps this particular saying and its simple, but elusive, underlying message—reinforced with increasing amounts of encouraging data—can help us to transform attitudes to treatment and reorient our efforts in the care of the seriously mentally ill.

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Acknowledgments

The authors would like to acknowledge the contribution of Professor Bruce Singh, who initiated the establishment of the original clinical research structure, the Aubrey Lewis Unit, and who has since given generous and skillful support at key developmental points. We also acknowledge the major role played by Associate Professor Jayashri Kulkarni in the growth of the clinical model over a number of years. Professors David Copolov and Helen Herrman also made an invaluable contribution, particularly from a research standpoint. A large num-

ber of highly committed and creative clinicians and researchers have also contributed to developing and improving the program and continue to do so. We also acknowledge the strong support of Health and Community Services for the clinical service. The research funding for the program provided by the Victorian Health Promotion Foundation through a research program grant "Preventive Strategies in Early Psychosis," which has established the Early Psychosis Research Centre, and additional support from the Australian National Health and Medical Research Council Schizophrenia Research Unit and the United States-based Stanley Foundation have also been an indispensable catalyst to the development of the Early Psychosis Prevention and Intervention Centre. We would also like to thank Paul Dudgeon (M.Sc.) for his expert statistical advice and Theresa Cheng for her invaluable assistance in preparing the manuscript.

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