

Assertive Community Treatment for People with Severe Mental Illness

Critical Ingredients and Impact on Patients

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Contents

Abstract	141
1. Assertive Community Treatment (ACT) and its History	142
1.1 Description of the ACT Model	142
1.2 Comparisons with Case Management	145
1.3 Admission Criteria	145
1.4 History of ACT	146
2. ACT Fidelity Scales	148
3. Effectiveness and Cost Effectiveness of ACT	148
3.1 ACT Effectiveness	148
3.2 Negative Outcomes from ACT	149
3.3 Cost Effectiveness of ACT	150
4. The Future of ACT	151
5. Conclusions	155

Abstract

This article describes the critical ingredients of the assertive community treatment (ACT) model for people with severe mental illness and then reviews the evidence regarding its effectiveness and cost effectiveness. ACT is an intensive mental health program model in which a multidisciplinary team of professionals serves patients who do not readily use clinic-based services, but who are often at high risk for psychiatric hospitalization. Most ACT contacts occur in community settings. ACT teams have a holistic approach to services, helping with medications, housing, finances and everyday problems in living. ACT differs conceptually and empirically from traditional case management approaches.

ACT is one of the best-researched mental health treatment models, with 25 randomized controlled trials evaluating its effectiveness. ACT substantially reduces psychiatric hospital use, increases housing stability, and moderately improves symptoms and subjective quality of life. In addition, ACT is highly successful in engaging patients in treatment. Research also suggests that the more closely case management programs follow ACT principles, the better the outcomes.

ACT services are costly. However, studies have shown the costs of ACT services to be offset by a reduction in hospital use in patients with a history of extensive hospital use.

The ACT model has been hugely influential in the mental health services field. ACT is significant because it offers a clearly defined model, and is clinically appealing to practitioners, financially appealing to administrators and scientifically appealing to researchers.

This article provides a detailed summary of the characteristics of the assertive community treatment (ACT) model for people with severe mental illness. ACT is a comprehensive, individualized approach to helping people with long term mental illness achieve optimal integration into normal community life.

Severe mental illness (SMI) defines a condition in which psychiatric disorders are characterized by pervasive impairments across different areas of functioning and often requires long term care in the community. SMI is defined using 3 criteria: (i) diagnosis; (ii) disability; and (iii) duration.^[1] The large majority of people with SMI have a diagnosis of a schizophrenia-spectrum disorder or bipolar disorder, but some have other psychiatric diagnoses, such as major depression and severe anxiety disorders. The second criterion is defined by impairments in functioning in areas, such as social relationships, work, leisure and self-care. Generally, a person receiving disability benefits because of a psychiatric disorder is presumed to meet the disability criterion. To meet the duration criterion, a person must have received intensive psychiatric treatment for a significant length of time, such as having a history of multiple psychiatric hospitalizations, a hospitalization of several months' duration or participation in an intensive treatment program.

In the US, beginning in the 1950s, a combination of economic, pharmacological, legal and humanitarian factors led to the deinstitutionalization of psychiatric patients from hospitals to the community.^[2] The number of residents in state mental hospitals declined from more than 550 000 to fewer than 90 000 by the 1990s.^[3] Initial efforts at deinstitutionalization were a dismal failure, with high

rates of patients being readmitted within a year of discharge.^[4] Since the 1970s, the consensus view in the US has been that many people with SMI require long term assistance to achieve optimal integration or reintegration into community life.^[5] ACT is one model of community care for providing long term assistance.

This review begins with a description of the ACT model, followed by a brief history of its dissemination and a description of the ACT 'fidelity' scales used to measure the degree to which particular programs follow the ACT model. After examining the evidence regarding the effectiveness and cost effectiveness of ACT, the review concludes with a discussion of future directions.

1. Assertive Community Treatment (ACT) and its History

1.1 Description of the ACT Model

ACT was developed by Leonard Stein and Mary Ann Test and their colleagues in the 1970s.^[6-9] Initially called Training in Community Living, the original program, still in operation in Madison, Wisconsin, was later named the Program of Assertive Community Treatment (PACT). ACT is also known by a number of other names, which are considered to be interchangeable, although some sources make distinctions between these names. Some of the more common names include 'the full service model',^[10] 'assertive outreach', 'mobile treatment teams' and 'continuous treatment teams'.

An ACT program consists of a multidisciplinary group of mental health professionals who work as a team to provide intensive services to patients with SMI. Most ACT contacts occur in community set-

tings. ACT teams have a holistic approach to providing services, helping with medications, housing, finances and anything else that is critical to an individual's success in living.

One of the seminal contributions made by the developers of the ACT model was to provide very clear and specific criteria for its critical ingredients.^[11] In this respect, ACT was unusual among mental health service models in the 1980s. Although ACT has been modified and extended over the past 2 decades, Stein and Test's original formulation has been remarkably enduring. Moreover, experts agree on most of the critical ingredients of the model.^[12] Some of the key attributes, also listed in table I, are described in the following sections.^[13,14]

1.1.1 Multidisciplinary Staffing

As is true in the treatment of other medical disorders, an ACT team consists of mental health professionals representing the different disciplines essential for the comprehensive care of people with SMI. Fully staffed ACT teams include psychiatrists, nurses, social workers and rehabilitation counselors. In recent years, it has been widely recognized that substance abuse counselors are critical additions to an ACT team because of the high rate of concurrent substance use disorders among people with SMI.^[15]

1.1.2 Integration of Services

In most areas, the social service system is fragmented, with different agencies and programs being responsible for different aspects of the patient's care. Through its multidisciplinary structure, the ACT team provides an integrated approach in which treatment issues (e.g. medications, physical healthcare, symptom control), rehabilitation issues (e.g. employment, activities of living, interpersonal relationships, housing), substance abuse treatment, practical assistance, social services, family services and other services are tailored to the needs and goals of each patient. The advantages of integrated approaches over 'brokered' approaches (i.e. referring patients to other programs for services) are well documented.^[16-18]

Table I. Key principles of assertive community treatment

Multidisciplinary staffing
Integration of services
Team approach
Low patient-staff ratios
Locus of contact in the community
Medication management
Focus on everyday problems in living
Rapid access
Assertive outreach
Individualized services
Time-unlimited services

1.1.3 Team Approach

ACT teams have shared caseloads, whereby several team members are in frequent contact with each patient. The ACT team meets daily to discuss patients, solve problems, and plan treatment and rehabilitation efforts. The entire team has responsibility for each patient, with different team members contributing their expertise as appropriate. One advantage of the team approach is increased continuity of care over time.^[19,20] By contrast, patients assigned case managers with individual caseloads may experience discontinuity in their therapeutic relationship whenever there is staff turnover.^[21] Test^[19] hypothesized that the team approach helps foster a supportive organizational environment leading to greater job satisfaction and lowered risk of staff 'burn-out' (emotional exhaustion followed by the depersonalization of patients). Burn-out is lower in ACT teams than in brokered case management programs.^[22,23]

1.1.4 Low Patient-Staff Ratios

Patient-staff ratios are small enough to ensure adequate individualization of services by ACT teams. The 10 : 1 ratio has been frequently used as a rule of thumb. In recent years, it has been increasingly recognized that the caseload ratio needs to take into account caseload characteristics. For patients with the most debilitating conditions, an even smaller ratio may be optimal, whereas for patients who are more stable, a ratio of 20 : 1 may be appropriate.^[24,25] When caseloads are too large, case management services are clearly ineffective.^[26-28]

1.1.5 Locus of Contact in the Community

All members of the ACT team make home visits. Most contacts with patients and others involved in their treatment (such as family members) occur in the patient's home or in community settings, not in mental health offices. As a rule of thumb, 80% or more of contacts should be out of the office, recognizing that some types of office contact are appropriate. Stein and Test hypothesized that *in vivo* contacts, that is, contacts in the natural settings in which patients live, work and interact with others, would be more effective than contacts in hospital or office settings, because skills taught in the hospital or clinic do not always transfer well to natural settings.^[29,30] In addition, assessment is more accurate *in vivo*,^[31] because practitioners can observe behavior directly rather than depending on patient self-reporting. Home visits also facilitate medication delivery, crisis intervention and networking.

1.1.6 Medication Management

A top priority for ACT teams is to ensure the effective use of medications, including accurate assessments (diagnosis and targeting of symptoms), choice of medications (including the novel antipsychotics), appropriate dosages and duration of therapy, and management of adverse effects, in accordance with evidence-based practice guidelines.^[32,33] A major role for ACT teams is the delivery of medications.

1.1.7 Focus on Everyday Problems in Living

ACT teams focus on a wide range of ordinary daily activities and chores, depending on a patient's most pressing needs, e.g. securing housing, meeting appointments, cashing checks and shopping. ACT teams also help patients learn to develop skills and support networks in natural settings.^[14]

1.1.8 Rapid Access

ACT teams differ sharply from most social services in that they respond quickly to patient emergencies, even when they occur after regular business hours. Stein and Test^[8] envisioned this program element to include 24-hour coverage. Witheridge^[14] suggested that '... staff often find ways to anticipate trouble and keep crises from erupting', sug-

gesting that the need for 24-hour coverage may be curtailed in a proactive ACT team.

1.1.9 Assertive Outreach

ACT teams are persistent in engaging reluctant patients, both during initial contacts and after they have enrolled. ACT teams do not automatically terminate contact with patients who miss appointments. Outreach stresses relationship-building^[34] and tangible help, especially with regard to finances and housing.^[35] Some ACT teams have a patient assistance fund to pay for emergency expenses.^[36]

1.1.10 Individualized Services

Treatments and support services are individualized to accommodate the needs and preferences of patients with SMI, who comprise a very heterogeneous population. Because of their broad knowledge of community resources and their wherewithal to access them, ACT teams often maximize the options available to patients, for example, in choosing where they live.^[14]

1.1.11 Time-Unlimited Services

In the Madison PACT program, patients do not 'graduate' from the program when their situation stabilizes, but they continue to receive ACT assistance on a lifelong basis. This allows for the development of long term, stable, trusting therapeutic relationships. This principle follows from studies suggesting that patients regressed when they were terminated from intensive short term programs.^[37] As suggested by more recent studies,^[25] however, there is a growing consensus that this principle should be modified for patients who show substantial improvement.

1.1.12 Other Elements

Many other elements are found in an ideal ACT team. Two deserving mention, even though their inclusion is not consistently found in practice, are also outlined here.

Outreach to Families

ACT teams work with families, providing psychoeducation and support, as well as involving them in the treatment plan when appropriate. One variation of ACT involves a more extensive set of inter-

ventions with family members, which is appropriate for patients who have significant contact with their families.^[38]

Vocational Assistance

Fully staffed ACT teams also include employment specialists who help patients to find and keep jobs in integrated work settings.^[39]

1.2 Comparisons with Case Management

Case management has been defined as the 'coordination, integration and allocation of care within limited resources.'^[40] ACT is a model of care providing treatment and rehabilitation in addition to performing case management functions. Although ACT is discussed in the context of case management, it should be noted that ACT is a more comprehensive service model.

The typical goals of case management, such as preventing hospitalization, improving quality of life, improving patient functioning, as well as some typical case management activities (e.g. service planning, assessment, and advocacy^[41]), overlap with those for ACT programs. However, the methods and resources used to achieve these ends differ sharply. Unlike ACT team members, traditional case managers usually broker services (i.e. link patients to other service providers) rather than intervene directly. Brokered case managers have individual caseloads, typically averaging about 30 patients (sometimes more), and far more circumscribed job duties.^[22,41] Studies have confirmed large differences in practice between ACT and brokered case management.^[42-44]

ACT also differs conceptually from intensive case management (ICM). One important difference is that ICM has no single origin. Consequently, unlike ACT, ICM has not achieved a clear consensus on its essential ingredients.^[45] However, like ACT, one core ingredient of ICM is the low patient-staff ratios. One frequently mentioned difference between ACT and ICM is that ICM programs do not subscribe to the team approach with shared caseloads and daily team meetings, a difference that has been empirically confirmed in one study.^[44]

1.3 Admission Criteria

Most authorities now agree that it is neither practical nor necessary to provide ACT programs universally to all patients with SMI. Instead, ACT is best suited for patients who do not effectively use less intensive types of mental health services.^[46] Historically, the most common method for defining admission criteria was frequent or extensive use of psychiatric hospitals.^[47] Marshall and Creed^[48] have identified 3 ways in which ACT teams have been conceptualized, each revolving around admission criteria. The first is to facilitate the discharge of long term inpatients, a strategy that has gained renewed interest with the closing and downsizing of several state and provincial hospitals.^[49,50] The second is as an alternative to admission for acutely ill patients, the so-called 'deflection' programs.^[8,36] Problems with deflection teams include potentially high staff burn-out and concerns about safety.^[51] The third and most popular use is to maintain unstable long term patients ('revolving door' patients) in the community.

Currently, most ACT programs target individuals with SMI who do not respond well to less intensive care modalities (e.g. they do not come to appointments) and are frequent users of emergency psychiatric services, especially inpatient care. Some programs specialize further by outreach to the homeless,^[52,53] patients dually diagnosed with mental illness and substance use disorders^[54] or those with a legal involvement.^[55-58]

What percentage of patients with SMI receiving mental health services requires ACT services? This is a complicated question that is without a single answer. According to Leonard Stein (personal communication, June 2000), the question cannot be answered in a vacuum. In a well-functioning mental health system, he estimates that ACT teams with a capacity of approximately 20% of all patients with SMI served by the mental health system would be adequate. If the service system is deficient, more ACT teams may be required to fill service gaps. Another rule of thumb, of interest to government planners, is that every community should have ACT teams with the capacity to serve 0.1% of the

general population. This staffing pattern approximates the capacity found in areas most committed to ACT (Rhode Island, Michigan, and Madison, Wisconsin).^[59]

1.4 History of ACT

1.4.1 Origins of the ACT Model

The research first establishing ACT as an effective model was preceded by a series of hospital-based studies conducted by a research unit in Mendota State Hospital in Madison, Wisconsin.^[60] These studies sought to enhance the transfer of skills taught in an exemplary hospital program to community life for discharged patients.^[61] The researchers concluded that the basic assumption of their research was flawed, because training in the hospital did not transfer well to community settings. Therefore, the research team changed its focus to community follow-along services. Like many other studies, their early research also suggested many patients relapsed soon after the intensive supports afforded in the hospital were removed. Thus, they also hypothesized that, to avoid this high failure rate, community programs needed to replicate the array of medical, residential, rehabilitation and other services provided by the hospital. That is, community programs needed to create a 'hospital without walls.'^[60] After pilot work using this innovative model proved promising with discharged patients, the research team obtained funding for a comparative study. Stein and Test's initial study^[8] involved deflecting patients presenting for hospitalization at a state hospital. One group received PACT services, whereas the comparison group received the standard community services. Results clearly demonstrated the advantages of the PACT program across a wide range of clinical and social outcomes. Moreover, a cost-benefit analysis showed that PACT was less expensive than usual services once the cost of hospitalization and the increased work productivity of PACT patients were factored in.^[62]

The study by Stein and Test^[8] has been hugely influential in mental health services research; it is probably the single most cited study in the litera-

ture on psychosocial treatment of mental illness in the twentieth century.^[63] It was significant because it offered a clearly defined model that was clinically appealing to practitioners, financially appealing to administrators and scientifically appealing to researchers.

1.4.2 Dissemination Throughout the US

Although several replication studies followed the original study,^[13] the ACT model was not initially as widely adopted as the developers had hoped. Detractors argued that ACT was specific to Madison and that model programs did not generalize to other local conditions.

The dissemination of ACT began in Wisconsin in the late 1970s.^[64] Building on an earlier replication study completed in 1982,^[65] Michigan rapidly spread its version of ACT across the state.^[66] In the late 1980s, 5 additional states followed suit, followed by 7 others in the 1990s. A 1996 survey reported 396 ACT teams in 34 states, including 11 states reporting ACT teams in 50% or more of their service areas.^[67] A Michigan-based nonprofit organization, Assertive Community Treatment Association, Inc. (ACTA), sponsors an annual conference and provides ACT training, certification and networking.^[68]

In 1996, the National Alliance for the Mentally Ill (NAMI), a US family advocacy group, departed from a long-standing organizational policy of not endorsing any specific psychosocial treatment model by vigorously promoting ACT as a best practice model through brochures^[69] and public pronouncements, formation of a private corporation^[70] and setting a goal of ensuring ACT services in all 50 states by 2002.^[71]

As ACT has been disseminated nationally, variations in the program model have increased. In Madison, the original PACT program underwent some changes in orientation, toward a strong emphasis on illness management and a de-emphasis on skills training.^[72] In Chicago, a psychiatric rehabilitation agency developed a modification of ACT that de-emphasized the multidisciplinary team and focused exclusively on frequently hospitalized patients, yielding a 'survival-oriented' ver-

sion of ACT.^[47,73] During the 1990s, an adaptation of ACT for very rural communities was also developed.^[74]

A 1995 telephone survey of 20 ACT experts identified 2 subgroups: (i) those who advocated large multidisciplinary teams with responsibility for 100 or more patients, with both day and evening shifts (i.e. PACT proponents adhering to the Madison model); and (ii) those who advocated smaller, often generalist, teams with responsibility for approximately 50 patients (i.e. proponents of the ACT adaptations in Michigan and Chicago).^[12]

Since the 1990s, pressures toward cost-containment have led to case management program designs that modify the ACT principle of time-unlimited services. Increasingly, program planners have adopted 'tiered' case management systems in which different levels of case management intensity are aimed at different levels of patient needs.^[75,76] Transferring ACT patients to less intensive case management services appears to be more successful if the transfers are individualized and the 'step-down' programs to which patients are transferred are well designed.^[25,76-78]

In recent years, state mental health administrators and program managers have increasingly appreciated the necessity of clear guidelines and systematic methods to monitor implementation if programs are to achieve close adherence to the ACT model.^[79,80] In recognition of this need, an ACT videotape^[81] and 2 ACT treatment manuals^[82,83] were developed and widely disseminated.

1.4.3 Worldwide Dissemination

Many sociocultural, political and economic factors have influenced the international spread of ACT. Deinstitutionalization has occurred later in many parts of the world than in the US; as large public hospitals have been depopulated, mental health authorities have become aware of the need for community services such as ACT.

An Australian program was one of the earliest replications of ACT.^[84] Recently, Canadian provincial governments in Ontario^[85] and Quebec^[59] have developed plans for ACT dissemination. Other Canadian provinces have also developed ACT pro-

grams.^[86,87] More than 60 ACT programs now exist throughout Canada, and Ontario now has an annual conference devoted entirely to ACT. In the UK, the incorporation of ACT principles into national standards for case management has been debated.^[88]

1.4.4 Practice Guidelines

The 1990s have brought an accelerating interest in 'evidence-based practice' in all areas of medicine, including mental health.^[89] A variety of governmental agencies and professional organizations in North America issued practice guidelines recognizing ACT as an evidence-based practice.^[59,75,85,90] The most influential of these was the Schizophrenia Patient Outcomes Research Team guidelines,^[91] which recommended ACT services for persons with schizophrenia who are either at high risk for rehospitalization or are heavy service users. This widespread recognition has helped legitimize ACT.

Despite some promising trends in ACT dissemination, actual practice patterns have lagged far behind. Lehman and Steinwachs^[92] examined patterns of usual care for 719 people with schizophrenia to determine conformance with treatment recommendations.^[91] Less than 2% of their sample was receiving case management even remotely approaching ACT standards. Although, as noted previously (section 1.3), the actual percentage of patients needing ACT services has never been established (and will vary according to the service system), this rate appears minuscule.

Managed care has accelerated the movement toward well-defined, evidence-based service models. The objective in managed care is to base reimbursement on clinical protocols. ACT is currently the only case management model approaching the standards needed for managed-care protocols.^[93] In 1999, President Clinton directed the Health Care Financing Administration, the federal agency responsible for the reimbursement of healthcare for indigent people, to authorize ACT as a Medicaid-reimbursable treatment.^[94] Several states have already changed their Medicaid plans to include ACT services, with many more expected to follow.

Similarly, in recognition of the growing acceptance of ACT, the accrediting commission for rehabilitation facilities in the US issued standards for ACT programs.^[95] A few managed-care organizations have begun incorporating ACT as a recognized treatment.^[96] As ACT becomes more widely adopted in managed-care environments, it will be important not to compromise standards for the sake of cost containment. For example, research does not support the use of a 'scaled-back' ACT team in which most ACT services are office-based and case management is subcontracted out.^[97]

2. ACT Fidelity Scales

As noted previously (see section 1.4.4), mental health planners are increasingly attentive of the need to establish program standards and monitor their implementation. Based on the premise that better implemented ACT programs have better patient outcomes, it is critical that we develop methods for assessing whether programs follow the ACT model. 'Fidelity' is the term used to denote adherence to the standards of a program model, and a 'fidelity scale' is a measure used to assess the degree to which a specific program meets the standards for a program model.^[98]

Three ACT fidelity scales have been published. The Index of Fidelity to ACT (IF-ACT) assesses 17 objective features of a program, such as the inclusion of a nurse on the team, frequency of team meetings and frequency of *in vivo* contacts. These items were retrospectively coded on 18 ACT programs in completed studies. Higher IF-ACT scores were highly predictive of better program outcomes in reducing hospital use. Five of the 17 fidelity items were also significantly correlated with the reduction of hospital use: shared caseloads, total number of contacts, 24-hour availability, a nurse on the team and daily team meetings.^[99]

A second such measure is a 13-item scale to assess fidelity of implementation of an ACT adaptation for patients with SMI and concurrent substance use disorders.^[43] Patients in high-fidelity ACT programs had higher rates of retention in treatment, greater remission from substance use disorders and

fewer hospital admissions than those in low-fidelity programs.^[100]

A third measure, the 28-item Dartmouth ACT Scale (DACTS),^[43] has been used most widely; it is reproduced in appendix I. An earlier 26-item version was piloted in 50 case management programs, representing 4 distinct types of service models: (i) ACT; (ii) ICM provided by the Veterans Administration; (iii) outreach programs for people who were homeless and mentally ill; and (iv) traditional case management. The DACTS discriminated across the 4 types of case management, consistent with the predicted order of similarity to ACT. Although subsequent psychometric studies have suggested some limitations to its reliability and capacity to discriminate between different types of programs,^[80,101,102] the DACTS has been appealing to administrators and program planners as a user-friendly tool for training and self-evaluation within programs.^[79,80,103]

3. Effectiveness and Cost Effectiveness of ACT

3.1 ACT Effectiveness

Numerous reviews of ACT have appeared in the literature in the last decade. These include 8 reviews identified by Bedell et al.^[104] and at least 6 others.^[46,48,105-108] Although these reviews differ somewhat in their details, all conclude that ACT increases the community integration of people with SMI.

ACT has been the most extensively researched of all case management models. Mueser et al.^[109] identified 32 randomized controlled trials of case management, of which 22 evaluated ACT and 5 evaluated ICM. ACT was the focus in 44 (59%) of 75 case management studies reviewed. Further, unlike ACT, other case management approaches reported in the literature were typically inadequately defined. Moreover, the most rigorous case management research has evaluated ACT programs.

In table II we summarize the outcomes from 25 randomized controlled trials of ACT. The table presents the statistically significant findings for 22 ACT studies^[8,13,35,42,53,57,61,65,84,110-122] reported in the review by Mueser et al.,^[109] adding 3 recent

Table II. Significant outcomes for assertive community treatment in 25 randomized controlled trials^a

Parameter	Effectiveness of ACT compared with control conditions [no. of trials (%)]		
	better	no different	worse
Psychiatric hospital use	17 (74%)	6 (26%)	0
Housing stability	8 (67%)	3 (25%)	1 (8%)
Symptoms	7 (44%)	9 (56%)	0
Quality of life	7 (58%)	5 (42%)	0
Social adjustment	3 (23%)	10 (77%)	0
Jail/arrests	2 (20%)	7 (70%)	1 (10%)
Substance use	2 (33%)	4 (67%)	0
Medication compliance	2 (50%)	2 (50%)	0
Vocational functioning	3 (37%)	5 (63%)	0
Patient satisfaction with services	7 (88%)	1 (12%)	0
Family members' satisfaction with services	2 (67%)	1 (33%)	0

a Patient numbers in these studies ranged from 28 to 873, with a median of 130 and mean of 171.2 patients. The follow-up period ranged from 3 to 36 months, with a median of 18 and a mean of 17.7 months. Studies included were: Bond et al.,^[110] Bond et al.,^[35] Bush et al.,^[111] Chandler et al.,^[112] Drake et al.,^[54] Essock and Kontos,^[42] Fekete et al.,^[113] Godley et al.,^[114] Hampton et al.,^[115] Hoult et al.,^[84] Jerrell and Hu,^[116] Lafave et al.,^[86] Lehman et al.,^[117] Marks et al.,^[118] Marx et al.,^[61] Merson et al.,^[119] Morse et al.,^[53] Morse et al.,^[120] Mowbray et al.,^[65] Quinlivan et al.,^[121] Rosenheck et al.,^[122] Salkever et al.,^[123] Solomon and Draine,^[57] Stein and Test,^[8] and Test^[13].

ACT studies^[54,86,123] not included in that review. Outcome domains are described by Mueser et al.^[109] Readers are referred to the aforementioned reviews for methodological details of individual studies, including study descriptions,^[109] study quality,^[108] fidelity of program implementation,^[46] and classification of types of control groups.^[46] The median sample size in the current summary was 130 patients, and the median follow-up period was 18 months. The control groups for these 25 studies were diverse, although many compared ACT with 'usual care' (usually some form of brokered case management).

In agreement with most other reviews,^[104] we conclude that ACT substantially reduces psychiatric hospital use, increases housing stability and moderately improves symptoms and subjective quality of life, but has little impact on social functioning. Also, as discussed in one review, ACT is

highly successful in engaging patients in treatment, increasing 1-year retention in mental health services from 54% for patients receiving usual services to 84% for ACT patients.^[124] Reviewers also concluded that the more closely case management programs follow ACT principles, the better the outcomes.^[46,104]

All reviews agreed that the strongest finding in favour of ACT pertained to the reduction in hospital use. One analysis of data from 34 study sites estimated that a higher-fidelity ACT program reduced hospitalizations by 78% compared with standard aftercare (appointments at the outpatient clinic) and by 58% compared with low intensity case management.^[46]

Importantly, traditional case management programs, in which services are brokered, do not produce similar outcomes.^[104,125] In fact, some studies showed worsening outcomes for patients receiving brokered case management compared with those receiving no systematic services at all.^[27,126]

To date, results of studies of ICM have been ambiguous. A source of confusion arises from the absence of an explicit ICM model. Rapp^[125] concluded that, although not as extensively researched, results of studies of ICM have been essentially the same as those for ACT. In contrast, several British studies of ICM have yielded very disappointing results. As a result, Marshall and Creed^[48] concluded that low caseload ratios do not automatically result in better outcomes for patients, but rather that specific organizational features of the ACT model (e.g. multidisciplinary staffing, daily team meetings, shared caseloads) are critical to its effectiveness. Further research is needed to explain the apparent discrepancy between the observations of British studies and those of other countries.

3.2 Negative Outcomes from ACT

The ACT literature has been very consistent in suggesting an absence of negative outcomes. As shown in table II, only 2 isolated findings were reported showing worsening of patient outcomes across the 11 outcome domains examined in 25 studies. Significantly, surveys suggest that patients

are generally satisfied with ACT services^[34] to a greater extent than those receiving the usual services.^[109]

Nevertheless, it is worth noting that some critics of the ACT model^[127-129] argue that ACT programs are coercive or paternalistic and that they are based on patient choice. This criticism is based mostly on anecdotes and theoretical arguments, rather than empirical studies. Apparently, only a minority of ACT patients, 11% in one study,^[130] believe ACT services are too intrusive or confining, or that they fostered dependency. Moreover, ACT teams confront, on a daily basis, many difficult issues involving a conflict between the best interests of patients and their expressed preferences.^[131] One large-scale survey of ACT teams, which evaluated the use of therapeutic limit setting (interventions to pressure patients to change disturbing or destructive behavior or to stay in treatment),^[132] found that case managers reported using a variety of techniques, ranging from simply ignoring a behavior or using verbal encouragement to assigning a representative payee or committing a patient to the hospital against their will. Verbal persuasion was widely used, whereas the more coercive interventions were used with less than 10% of the patients. Case managers were more active in setting limits with patients who had more extensive hospitalization histories, more symptoms, more arrests and/or more recent substance use.

Finally, we note that by helping patients avoid hospitalization (including involuntary commitments), ACT enables them to live more normal lives and, in this respect, ACT increases patient choice.

3.3 Cost Effectiveness of ACT

The intensity of ACT services means that they are costly. Two estimates of the annual per patient cost of ACT services ranged from about \$US7000 (1995 values) in New Hampshire^[133] to \$US8244 (1994 values) in Baltimore,^[52] compared with about half that rate for patients receiving standard case management (with a staff-to-patient ratio of 1 : 25). Such costs can be justified to the extent that they are offset by a reduction in the cost of other

resources and by the benefits for those served by an ACT team. In the US, a major policy analysis in progress is estimating the costs of ACT under different assumptions for staffing and under different financing schemes.^[134]

As previously noted (section 3.1), the most consistent finding concerning the effects of ACT is a reduction in hospitalization. In theory, ACT should also reduce the use of outpatient services (other than ACT) because the ACT team becomes, in effect, the outpatient clinic for the patient. However, a comprehensive review indicated that there was no reliable reduction in outpatient use by ACT patients compared with controls.^[46] The impact of ACT on housing costs has been measured in a few studies, with inconsistent results.^[62,135-137] Homeless outreach programs typically show increased housing costs associated with movement from the streets and shelters toward more stable community housing.^[117,120,138]

Based on the published evidence, the only reliable reduction in cost to counterbalance the cost of ACT itself appears to be the reduction in hospital costs. However, this reduction is so significant that almost all studies that have attempted to compare the costs of ACT with those of other services have reported lower overall costs for ACT.^[46] The comprehensiveness of the costs measured and the methods used to measure costs vary greatly across studies.^[46,139] However, it is obvious that the greater the reduction in the number of hospital days patients average per year prior to their admission into ACT, the greater the potential savings.

Recently studies have gone beyond simply comparing net costs across conditions to examining cost effectiveness; that is, comparing the cost of obtaining a unit of clinical effectiveness (such as a unit of change in quality of life) between ACT and an alternative.^[140] These studies have reported higher cost-effectiveness ratios for ACT, although the differences were not always statistically significant.^[52,133,141] ACT services are justified from an economic point of view to the extent that they generate more benefits per dollar than alternative programs: it would be setting too high a standard, in

relation to other health and social services, to require that the cost of ACT services be completely compensated by a reduction in other costs. This distinction is important as the trend toward reducing reliance on hospital care for all patients will make it increasingly difficult for ACT programs to break even.

From a systems perspective, an important question about the provision of ACT is not only whether hospitalization and other expensive mental health services can be reduced for a particular group of individuals, but also whether costly services can be reduced for an entire community. One study examined the impact of introducing an ACT team to coordinate community services for a state hospital unit serving a geographic area within a city.^[142] The ACT model was adapted to provide a flexible duration of services, transferring patients to less intensive services when appropriate. Over a 4-year period, there was a linear decline in hospital bed-days in the section of the city where this team operated, whereas hospital bed-days in a comparative area lacking an ACT team did not decline but actually increased.^[142]

4. The Future of ACT

The 2 decades since the publication of the seminal ACT articles have witnessed a variety of adaptations and expansions of ACT in response to different patient groups. The most important changes have resulted from an increasing awareness that ACT must include specialists, such as substance abuse counselors and employment specialists, to address the extremely common needs of patients with SMI. Without input from these areas of expertise, ACT is unlikely to affect substance use or employment, as previous ACT reviews have shown.^[109] ACT teams also require experts in housing, especially programs serving the homeless, legal expertise for those serving jail populations, and so forth. Moreover, these specialists must learn to adapt their specialty skills and knowledge to the severely mentally ill population.

ACT programs often fail to address other common problems,^[143] such as trauma,^[144] and medi-

cal and dental care needs. According to Leonard Stein (personal communication, November 2000), what makes ACT relatively unique is its flexibility as a vehicle to deliver cutting-edge treatment, rehabilitation and case management services. What it delivers, and how and to whom it is provided, may change with new discoveries.

As ACT adaptations proliferate, it is critical to document both the specific program elements added or adapted and the outcomes from such adaptations. It is also important not to overextend the ACT model to uses for which it is not suited. For example, there may be patient groups for whom ACT is contraindicated, such as those with personality disorder diagnoses.^[145] From the outset, the strength of the ACT model has been its foundation on empirical data rather than ideology. Adaptations may be intuitively appealing, but they require careful research before they can be recommended.

Despite its status as evidence-based practice, ACT should also be examined from the stand-point of what ACT programs are not achieving. In most areas, the inclusion of a vocational focus has not been realized, despite the evidence showing the effectiveness of supported employment and its compatibility with ACT.^[146] Social skills training and development of social networks,^[147] in addition to working with family members,^[38] have also been neglected despite ample support for these approaches.

Accompanying the shift toward a 'recovery' model for severe mental illness and the growing emphasis on consumer empowerment has been the move toward including mental health patients as providers within the mental health system.^[148] Research findings on the effectiveness of consumers as case managers have been mixed.^[104] A recent, large, multicentre study concluded that patient outcomes were similar for consumer and nonconsumer case managers.^[149] Some researchers have concluded that including consumers as staff on case management teams changes the practice culture.^[150-152]

Financing will continue to influence the dissemination of ACT. If further research confirms the promise of 'step-down' models and related approaches,

Appendix I. Dartmouth assertive community treatment scale^[43]

Criterion	Ratings/anchors					
	1	2	3	4	5	
Human resources: structure and composition						
H1	Small caseload: client/provider ratio of 10 : 1	50 clients/clinician or more	35-49	21-34	11-20	10 clients/clinician or fewer
H2	Team approach: provider group functions as team rather than as individual practitioners; clinicians know and work with all clients	<10% clients with multiple staff contacts in reporting week	10-36%	37-63%	64-89%	90% or more clients show contact with >1 staff member in 1 week
H3	Program meeting: program meets frequently to plan and review services for each client	Program service-planning for each client usually occurs once/month or less frequently	At least twice/month but less often than once/week	At least once/week but less often than twice/week	At least twice/week but less often than 4 times/week	Program meets at least 4 days/week and reviews each client each time, even if only briefly
H4	Practicing team leader: supervisor of front line clinicians provides direct services	Supervisor provides no services	Supervisor provides services on rare occasions as backup	Supervisor provides services routinely as backup, or less than 25% of the time	Supervisor normally provides services between 25 and 50% of the time	Supervisor provides services at least 50% time
H5	Continuity of staffing: program maintains same staffing over time	>80% turnover in 2 years	60-80% turnover in 2 years	40-59% turnover in 2 years	20-39% turnover in 2 years	<20% turnover in 2 years
H6	Staff capacity: program operates at full staffing	Program has operated at <50% of staffing in past 12 months	50-64%	65-79%	80-94%	Program has operated at 95% or more of full staffing in past 12 months
H7	Psychiatrist on staff: there is at least 1 full-time psychiatrist per 100 clients assigned to work with the program	Program for 100 clients has <0.10 FTE regular psychiatrist	0.10-0.39 FTE per 100 clients	0.40-0.69 FTE per 100 clients	0.70-0.99 FTE per 100 clients	At least one full-time psychiatrist is assigned directly to a 100-client program
H8	Nurse on staff: there are at least 2 full-time nurses assigned to work with a 100-client program	Program for 100 clients has <0.20 FTE regular nurse	0.20-0.79 FTE per 100 clients	0.80-1.39 FTE per 100 clients	1.40-1.99 FTE per 100 clients	Two full-time nurses or more are members of a 100-client program
H9	Substance abuse specialist on staff: a 100-client program includes at least 2 staff members with 1 year of training or clinical experience in substance abuse treatment	Program has <0.20 FTE S/A expertise per 100 clients	0.20-0.79 FTE per 100 clients	0.80-1.39 FTE per 100 clients	1.40-1.99 FTE per 100 clients	Two FTEs or more with 1 year S/A training or supervised S/A experience
H10	Vocational specialist on staff: the program includes at least 1 staff member with 1 year of training/experience in vocational rehabilitation and support	Program has <0.20 FTE vocational expertise per 100 clients	0.20-0.79 FTE per 100 clients	0.80-1.39 FTE per 100 clients	1.40-1.99 FTE per 100 clients	Two FTEs or more with 1 year vocational rehabilitation training or supervised VR experience
H11	Program size: program is of sufficient absolute size to consistently provide the necessary staffing diversity and coverage	Program has <2.5 FTE staff	2.5-4.9 FTE	5.0-7.4 FTE	7.5-9.9	Program has at least 10 FTE staff

Organizational boundaries

O1	Explicit admission criteria: program has clearly identified mission to serve a particular population and has and uses measurable and operationally defined criteria to screen out inappropriate referrals	Program has no set criteria and takes all types of cases as determined outside the program	Program has a generally defined mission but the admission process is dominated by organizational convenience	The program makes an effort to seek and select a defined set of clients but accepts most referrals	Program typically actively seeks and screens referrals carefully but occasionally bows to organizational pressure	The program actively recruits a defined population and all cases comply with explicit admission criteria
O2	Intake rate: program takes clients in at a low rate to maintain a stable service environment	Highest monthly intake rate in the last 6 months = >15 clients/month	13-15	10-12	7-9	Highest monthly intake rate in the last 6 months no greater than 6 clients/month
O3	Full responsibility for treatment services: in addition to case management and psychiatric services, program directly provides counseling/psychotherapy, housing support, substance abuse treatment, employment, and rehabilitative services	Program provides no more than case management and psychiatric services	Program provides one of 5 additional services and refers externally for others	Program provides 2 of 5 additional services and refers externally for others	Program provides 3 or 4 of 5 additional services and refers externally for others	Program provides all 5 of these services to clients
O4	Responsibility for crisis services: program has 24-hour responsibility for covering psychiatric crises	Program has no responsibility for handling crises after hours	Emergency service has program-generated protocol for program clients	Program is available by telephone, predominantly in consulting role	Program provides emergency service backup; e.g. program is called, makes decision about need for direct program involvement	Program provides 24-hour coverage
O5	Responsibility for hospital admissions: program is involved in hospital admissions	Program has no involvement in <5% decisions to hospitalize	5-34% of admissions are initiated through the program	35-64% of admissions are initiated through the program	65-94% of admissions are initiated through the program	95% or more admissions are initiated through the program
O6	Responsibility for hospital discharge planning: program is involved in planning for hospital discharges	Program has involvement in <5% of hospital discharges	5-34% of program client discharges are done in cooperation with the program	35-64% of program client discharges are done in cooperation with the program	65-94% of program client discharges are done in cooperation with the program	95% or more discharges are planned jointly with the program
O7	Time-unlimited services: program never closes cases but remains the point of contact for all clients as needed	>90% of clients are expected to be discharged within 1 year	From 38-90% of clients are expected to be discharged within 1 year	From 18-37% of clients are expected to be discharged within 1 year	From 5-17% of clients are expected to be discharged within 1 year	All clients are served on a time-unlimited basis, with fewer than 5% expected to graduate annually
Nature of services						
S1	<i>In-vivo</i> services: program works to monitor status, develop community living skills <i>in vivo</i> rather than in office	<20% time in community	20-39%	40-59%	60-79%	80% of total service time in community
S2	No dropout policy: program engages and retains clients at mutually satisfactory level	<50% of the caseload is retained over a 12-month period	50-64%	65-79%	80-94%	95% or more of caseload is retained over a 12-month period

Continued next page

Appendix I. Contd

Criterion	Ratings/anchors					
	1	2	3	4	5	
S3	Assertive engagement mechanisms: as part of assuring engagement, program uses street outreach, as well as legal mechanisms (e.g. representative payees, probation/parole, OP commitment) as indicated	Program passive in recruitment and re-engagement; almost never uses street outreach legal mechanisms	Program makes initial attempts to engage but generally focuses efforts on most motivated clients	Program attempts outreach and uses legal mechanisms only as convenient	Program usually has plan for engagement and uses most of the mechanisms that are available	Program demonstrates consistently well thought out strategies and uses street outreach and legal mechanisms whenever appropriate
S4	Intensity of service: high total amount of service time as needed	Average of <15 min/week or less per client	15-49 minutes/week	50-84 minutes/week	85-119 minutes/week	Average of 2 hours/week or more per client
S5	Frequency of contact: high number of service contacts as needed	Average of <1 contact/week or fewer per client	1-2 /week	2-3 /week	3-4 /week	Average of 4 or more contacts/week per client
S6	Work with support system: with or without client present, program provides support and skills for client's support network: family, landlords, employers	<0.5 contact/month per client with support system	0.5-1 contact per month per client with support system in the community	1-2 contact per month per client with support system in the community	2-3 contacts/month per client with support system in the community	Four or more contacts/month per client with support system in the community
S7	Individualized substance abuse treatment: 1 or more members of the program provide direct treatment and substance abuse treatment for clients with substance use disorders	Clients with substance use disorders average <3 minutes/week in substance abuse treatment	From 3-9 minutes/week	From 10 to 16 minutes/week	From 17-23 minutes/week	Clients with substance use disorders spend 24 minutes/week or more in substance abuse treatment
S8	Dual disorder treatment groups: program uses group modalities as a treatment strategy for people with substance use disorders	<5% of the clients with substance use disorders attend at least 1 substance abuse treatment group meeting during a month	5-19%	20-34%	35-49%	50% or more of the clients with substance use disorders attend at least 1 substance abuse treatment group meeting during a month
S9	Dual disorders (DD) model: program uses a stage-wise treatment model that is non-confrontational, follows behavioral principles, considers interactions of mental illness and substance abuse, and has gradual expectations of abstinence	Program fully based on traditional model: confrontation; mandated abstinence; higher power, etc.	Program uses primarily traditional model: e.g. refers to AA; uses inpatient detoxification and rehabilitation; recognizes need for persuasion of clients in denial or who do not fit AA	Program uses mixed model: e.g. DD principles in treatment plans; refers clients to persuasion groups; uses hospitalization for rehabilitation; refers to AA, NA	Program uses primarily DD model: e.g. DD principles in treatment plans; persuasion and active treatment groups; no hospitalization for rehabilitation nor detoxification except for medical necessity; refers out some S/A treatment	Program fully based in DD treatment principles, with treatment provided by program staff
S10	Role of consumers on treatment team: consumers are involved as members of the team providing direct services	Consumers have no involvement in service provision in relation to the program	Consumer(s) fill consumer-specific service roles with respect to program (e.g. self-help)	Consumer(s) formally assist in provision of direct services (e.g. co-lead groups)	Consumer(s) work in case management roles with reduced responsibility	Consumer(s) are employed as clinicians (e.g. case managers) with full professional status

AA = Alcoholics Anonymous; **DD** = dual disorders; **FTE** = full-time equivalent; **NA** = Narcotics Anonymous; **OP** = outpatient; **S/A** = substance abuse; **VR** = vocational rehabilitation.

we can expect the expansion of 'tiered' case management approaches in which patients are matched to their level of need. Perhaps the biggest barrier to this development has been the absence of valid methods to determine patient need. Tiered case management approaches work best when movement between levels of case management is carefully organized.^[25]

Finally, we cannot overemphasize that ACT does not work in isolation. ACT teams are most successful when the service system is adequately financed and well managed.

5. Conclusions

Assertive community treatment is widely recognized as an evidence-based practice for adults with severe mental illness. Its research base includes 25 well-controlled studies in a variety of settings. ACT principles include the use of a team approach, close integration of treatment and rehabilitation, a focus on practical problems in living, and locus of contact with patients in the community, all of which have become widely accepted as the foundation for community care for this population.

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References

- Schinnar A, Rothbard A, Kanter R, et al. An empirical literature review of definitions of severe and persistent mental illness. *Am J Psychiatry* 1990; 147: 1602-8
- Talbott JA, editor. *The chronic mental patient*. Washington, DC: American Psychiatric Association, 1978
- Torrey EF. *Surviving schizophrenia: a manual for families, consumers, and providers*. 3rd ed. New York (NY): Harper-Collins, 1995
- Weiden PJ, Olfson M. The cost of relapse in schizophrenia. *Schizophr Bull* 1993; 21: 419-28
- Turner JC, TenHoor WJ. The NIMH community support program: pilot approach to a needed social reform. *Schizophr Bull* 1978; 4: 319-48
- Gold Award: community treatment program. *Hosp Community Psychiatry* 1974; 25: 669-72
- Stein LI, Test MA, Marx AJ. Alternative to the hospital: a controlled study. *Am J Psychiatry* 1975; 132: 517-22
- Stein LI, Test MA. An alternative to mental health treatment. I: Conceptual model, treatment program, and clinical evaluation. *Arch Gen Psychiatry* 1980; 37: 392-7
- Stein LI, Test MA. The Training in Community Living model: a decade of experience. *New Dir Ment Health Serv* 1985; 26: 1-98
- Solomon P. The efficacy of case management services for severely mentally disabled clients. *Community Ment Health J* 1992; 28: 163-80
- Test MA, Stein LI. Practice guidelines for the community treatment of markedly impaired patients. *Community Ment Health J* 1976; 12: 72-82
- McGrew JH, Bond GR. Critical ingredients of assertive community treatment: judgments of the experts. *J Ment Health Adm* 1995; 22: 113-25
- Test MA. Training in community living. In: Liberman RP, editor. *Handbook of psychiatric rehabilitation*. New York (NY): MacMillan, 1992; 153-70
- Witheridge TF. The 'active ingredients' of assertive outreach. *New Dir Ment Health Serv* 1991; 52: 47-64
- Drake RE, Mercer-McFadden C, Mueser KT, et al. Treatment of substance abuse in patients with severe mental illness: a review of recent research. *Schizophr Bull* 1998; 24: 589-608
- Bond GR. Principles of the Individual Placement and Support model: empirical support. *Psychiatr Rehabil J* 1998; 22 (1): 11-23
- Drake RE, Becker DR, Xie H, et al. Barriers in the brokered model of supported employment for persons with psychiatric disabilities. *J Vocational Rehabil* 1995; 5: 141-50
- Rosenheck R, Morrissey J, Lam J, et al. Service system integration, access to services, and housing outcomes in a program for homeless persons with severe mental illness. *Am J Public Health* 1998; 88: 1610-5
- Test MA. Continuity of care in community treatment. *New Dir Ment Health Serv* 1979; 2: 15-23
- Ware NC, Tugenberg T, Dickey B, et al. An ethnographic study of the meaning of continuity of care in mental health services. *Psychiatr Serv* 1999; 50: 395-400
- Bond GR, Pensec M, Dietzen L, et al. Intensive case management for frequent users of psychiatric hospitals in a large city: A comparison of team and individual caseloads. *Psychosoc Rehabil J* 1991; 15 (1): 90-8
- Boyer SL, Bond GR. Does assertive community treatment reduce burnout? A comparison with traditional case management. *Mental Health Serv Res* 1999; 1: 31-45
- Salyers MP. Predictors and consequences of staff burnout: a longitudinal study of assertive community treatment case managers [dissertation]. Indianapolis (IN): Indiana University-Purdue University Indianapolis, 1997
- Ryan CS, Sherman PS, Bogart LM. Patterns of services and consumer outcome in an intensive case management program. *J Consult Clin Psychol* 1997; 65: 485-93
- Salyers MP, Masterton TW, Fekete DM, et al. Transferring clients from intensive case management: impact on client functioning. *Am J Orthopsychiatry* 1998; 68: 233-45
- Björkman T, Hansson L. What do case managers do? An investigation of case manager interventions and their relationship to client outcome. *Soc Psychiatry Psychiatr Epidemiol* 2000; 35: 43-50
- Franklin JL, Solovitz B, Mason M, et al. An evaluation of case management. *Am J Public Health* 1987; 77: 674-8
- King R, Le Bas J, Spooner D. The impact of caseload on the personal efficacy of mental health case managers. *Psychiatr Serv* 2000; 51: 364-8

29. Dilk MN, Bond GR. Meta-analytic evaluation of skills training research for individuals with severe mental illness. *J Consult Clin Psychol* 1996; 64: 1337-46
30. Stein LI. 'It's the focus, not the locus.' Hocus-pocus! [comment]. *Hosp Community Psychiatry* 1988; 39: 1029
31. Bond GR, Friedmeyer MH. Predictive validity of situational assessment at a psychiatric rehabilitation center. *Rehabil Psychol* 1987; 32: 99-112
32. McEvoy JP, Scheffler PL, Frances A. The expert consensus guideline series: treatment of schizophrenia 1999. *J Clin Psychiatry* 1999; 60 Suppl. 11: 1-80
33. Miller AL, Chiles JA, Chiles JK, et al. Medication treatment for the severely and persistently mentally ill: the Texas Medication Algorithm Project. *J Clin Psychiatry* 1999; 60: 649-57
34. McGrew JH, Wilson R, Bond GR. Client perspectives on helpful ingredients of assertive community treatment. *Psychiatr Rehabil J* 1996; 19 (3): 13-21
35. Bond GR, Witheridge TF, Dincin J, et al. Assertive community treatment for frequent users of psychiatric hospitals in a large city: a controlled study. *Am J Community Psychol* 1990; 18: 865-91
36. Bond GR, Witheridge TF, Wasmer D, et al. A comparison of two crisis housing alternatives to psychiatric hospitalization. *Hosp Community Psychiatry* 1989; 40: 177-83
37. Test MA, Knoedler WH, Allness DJ. The long-term treatment of young schizophrenics in a community support program. *New Dir Ment Health Serv* 1985; 26: 17-27
38. McFarlane WR, Stastny P, Deakins S. Family-aided assertive community treatment: a comprehensive rehabilitation and intensive case management approach for persons with schizophrenic disorders. *New Dir Ment Health Serv* 1992; 53: 43-54
39. Russert MG, Frey JL. The PACT vocational model: A step into the future. *Psychosocial Rehabil J* 1991; 14 (4): 7-18
40. Thornicroft G. The concept of case management for long-term mental illness. *Int Rev Psychiatry* 1991; 3: 125-32
41. Ellison ML, Rogers ES, Sciarappa K, et al. Characteristics of mental health case management: results of a national survey. *J Ment Health Adm* 1995; 22: 101-12
42. Essock SM, Kontos N. Implementing assertive community treatment teams. *Hosp Community Psychiatry* 1995; 46: 679-83
43. Teague GB, Drake RE, Ackerson TH. Evaluating use of continuous treatment teams for persons with mental illness and substance abuse. *Psychiatr Serv* 1995; 46: 689-95
44. Teague GB, Bond GR, Drake RE. Program fidelity in assertive community treatment: development and use of a measure. *Am J Orthopsychiatry* 1998; 68: 216-32
45. Schaele R, Epstein I. Specifying intensive case management: a multiple stakeholder approach. *Ment Health Serv Res* 2000; 2: 95-105
46. Latimer E. Economic impacts of assertive community treatment: a review of the literature. *Can J Psychiatry* 1999; 44: 443-54
47. Witheridge TF, Dincin J, Appleby L. Working with the most frequent recidivists: a total team approach to assertive resource management. *Psychosocial Rehabil J* 1982; 5 (1): 9-11
48. Marshall M, Creed F. Assertive community treatment: is it the future of community care in the UK? *Int Rev Psychiatry* 2000; 12: 191-6
49. Hadley TR, Turk R, McGurrin M. Community treatment teams: an alternative to state hospitals. *Psychiatr Q* 1997; 68: 77-90
50. Rothbard AB, Kuno E, Schinnar AP, et al. Service utilization and cost of community care for discharged state hospital patients: a 3-year follow-up study. *Am J Psychiatry* 1999; 156: 920-7
51. Marshall M. Designing psychiatric services to reduce hospital admissions. *Clin Evidence* 1999; 1: 63-70
52. Lehman AF, Dixon L, Hoch JS, et al. Cost-effectiveness of assertive community treatment for homeless persons with severe mental illness. *Br J Psychiatry* 1999; 174: 346-52
53. Morse GA, Calsyn RJ, Allen G, et al. Experimental comparison of the effects of three treatment programs for homeless mentally ill people. *Hosp Community Psychiatry* 1992; 43: 1005-10
54. Drake RE, McHugo GJ, Clark RE, et al. Assertive community treatment for patients with co-occurring severe mental illness and substance use disorder: a clinical trial. *Am J Orthopsychiatry* 1998; 68: 201-15
55. Draine J, Solomon P. Describing and evaluating jail diversion services for persons with serious mental illness. *Psychiatr Serv* 1999; 50: 56-61
56. Gold Award. Prevention of jail and hospital recidivism among persons with severe mental illness. *Psychiatr Serv* 1999; 50: 1477-80
57. Solomon P, Draine J. One-year outcomes of a randomized trial of case management with seriously mentally ill clients leaving jail. *Eval Rev* 1995; 19: 256-73
58. Steadman HJ, Deane MW, Morrissey JP, et al. A SAMHSA research initiative assessing the effectiveness of jail diversion programs for mentally ill persons. *Psychiatr Serv* 1999; 50: 1620-3
59. Latimer E. Conseil d'évaluation des technologies de la santé du Québec. Suivi intensif en équipe dans la communauté pour personnes atteintes de troubles mentaux graves. (CETS 99-1 RF). Montréal: Conseil d'évaluation des technologies (CETS); 1999
60. Greenley JR. Madison, Wisconsin, United States: creation and implementation of the Program of Assertive Community Treatment (PACT). In: Schulz R, Greenley JR, editors. *Innovating in community mental health: international perspectives*. Westport (CT): Praeger, 1995: 83-96
61. Marx AJ, Test MA, Stein LI. Extrohospital management of severe mental illness. *Arch Gen Psychiatry* 1973; 29: 505-11
62. Weisbrod BA, Test MA, Stein LI. Alternative to mental hospital treatment. II: Economic benefit-cost analysis. *Arch Gen Psychiatry* 1980; 37: 400-5
63. Dixon L. Assertive community treatment: twenty-five years of gold. *Psychiatr Serv* 2000; 51: 759-65
64. Deci PA, Santos AB, Hiott DW, et al. Dissemination of assertive community treatment teams. *Psychiatr Serv* 1995; 46: 676-8
65. Mowbray CT, Collins ME, Plum TB, et al. Harbinger I: the development and evaluation of the first PACT replication. *Admin Policy Ment Health* 1998; 25: 105-24
66. Mowbray CT, Plum TB, Masterton T. Harbinger II: deployment and evolution of assertive community treatment in Michigan. *Admin Policy Ment Health* 1998; 25: 125-39
67. Meisler N. Assertive community treatment initiatives: results from a survey of selected state mental health authorities. *Community Support Network News* 1997; 11 (4): 3-5
68. Assertive Community Treatment Association, Inc [online]. Available from: URL: <http://www.actassociation.com> [Accessed 2001 Feb 17]
69. National Alliance for the Mentally Ill (NAMI). *Treatment works: NAMI consumer and family guide to schizophrenia treatment*. Alexandria (VA): NAMI, 1998

70. Furlong-Norman KE. Meeting review – states helping states: programs of assertive community treatment and managed care. *Community Support Network News* 1997; 11 (4): 1-20
71. Flynn LM. Commentary. *Schizophr Bull* 1998; 24: 30-2
72. Thompson ST, Griffith EE, Leaf PJ. A historical review of the Madison model of community care. *Hosp Community Psychiatry* 1990; 41: 625-34
73. Bond GR. Variations in an assertive outreach model. *New Dir Ment Health Serv* 1991; 52: 65-80
74. Santos AB, Deci PA, Lachance KR, et al. Providing assertive community treatment for severely mentally ill patients in a rural area. *Hosp Community Psychiatry* 1993; 44: 34-9
75. Giesler LJ, Hodge M. Case management in behavioral health care. *Int J Ment Health* 1998; 27: 26-40
76. Sherman PS, Ryan CS. Intensity and duration of intensive case management services. *Psychiatr Serv* 1998; 49: 1585-9
77. Knapp MR, Marks IM, Wolstenholme J, et al. Home-based versus hospital-based care for serious mental illness: controlled cost-effectiveness study over four years. *Br J Psychiatry* 1998; 172: 506-12
78. Rosenthal RN, Hellerstein DJ, Miner CR. Stable patients tolerate step-down in targeted assertive outreach (TAO) services [abstract]. In: *American Psychiatric Association Conference* 2000; 2000 May 13-18; Chicago (IL), 215
79. Bond GR. Assertive community treatment as an evidence-based practice: critical ingredients, program implementation, and client outcomes. *Annual Conference of the Indiana Division of Addiction and Mental Health Services*; 2001 Feb 21-23; Indianapolis
80. Bond GR, Williams J, Evans L, et al. *Psychiatric rehabilitation fidelity toolkit*. Cambridge (MA): Human Services Research Institute, 2000
81. Harron B, Burns BJ, Swartz M. *Hospital without walls* [videotape]. Durham (NC): Duke University, 1993
82. Allness DJ, Knoedler WH. *The PACT model of community-based treatment for persons with severe and persistent mental illness: a manual for PACT start-up*. Arlington (VA): National Alliance for the Mentally Ill, 1998
83. Stein LI, Santos AB. *Assertive community treatment of persons with severe mental illness*. New York (NY): W. W. Norton, 1998
84. Hoult J, Reynolds I, Charbonneau-Powis M, et al. Psychiatric hospital versus community treatment: the results of a randomised trial. *Aust N Z J Psychiatry* 1983; 17: 160-7
85. Cochrane J, Durbin J, Goering P. *Best practices in mental health reform: discussion paper*. Toronto (ON): Clarke Institute of Psychiatry, 1997
86. Lafave HG, deSouza HR, Gerber GJ. Assertive community treatment of severe mental illness: a Canadian experience. *Psychiatr Serv* 1996; 47: 757-9
87. Müller-Clemm W. *Halting the 'revolving door' of serious mental illness: evaluating an assertive case management program* [dissertation]. Victoria (BC): University of Victoria, 1996
88. Tyrer P. Whither community care? *Br J Psychiatry* 1998; 173: 359-60
89. Drake RE, Mueser KT, Torrey WC, et al. Evidence-based treatment of schizophrenia. *Curr Psychiatry Rep* 2000; 2: 393-7
90. Torrey WC, Wyzik PF. *New Hampshire clinical practice guidelines for adults in community support programs*. Lebanon (NH): West Central Services, 1997 Sep 1
91. Lehman AF, Steinwachs DM, PORT co-investigators. At issue: translating research into practice. *The Schizophrenia Patient Outcomes Research Team (PORT) treatment recommendations*. *Schizophr Bull* 1998; 24: 1-10
92. Lehman AF, Steinwachs DM. Patterns of usual care for schizophrenia: initial results from the Schizophrenia Patient Outcomes Research Team (PORT) client survey. *Schizophr Bull* 1998; 24: 11-23
93. Manderscheid RW, Henderson MJ. Federal and state legislative and program directions for managed care. In: Mullen EJ, Magnabosco JL, editors. *Outcome measurement in the human services: cross-cutting issues and methods*. Washington, DC: National Association of Social Workers Press; 1997; 113-23
94. News & Notes. President Clinton announces an array of initiative at First White House Conference on Mental Health. *Psychiatr Serv* 1999; 50: 980-1
95. *Commission on Accreditation of Rehabilitation Facilities. 2000 Behavioral standards manual*. Tucson (AZ): CARF, the Rehabilitation Accreditation Commission, 2000
96. Quinlivan R. Managed care: cost savings and rehabilitation. *Compatible goals in for-profit care for persons with serious mental illness?* *Psychiatr Serv* 1997; 48: 1269-71
97. Talbott JA, Geller JL, Satel SL, et al. A roundtable discussion about the future of psychiatric services. *Psychiatr Serv* 2000; 51: 1513-6
98. Bond GR, Evans L, Salyers MP, et al. Measurement of fidelity in psychiatric rehabilitation. *Ment Health Serv Res* 2000; 2: 75-87
99. McGrew JH, Bond GR, Dietzen LL, et al. Measuring the fidelity of implementation of a mental health program model. *J Consult Clin Psychol* 1994; 62: 670-8
100. McHugo GJ, Drake RE, Teague GB, et al. The relationship between model fidelity and client outcomes in the New Hampshire Dual Disorders Study. *Psychiatr Serv* 1999; 50: 818-24
101. Johnsen M, Samberg L, Calsyn R, et al. Case management models for persons who are homeless and mentally ill: the ACCESS Demonstration Project. *Community Ment Health J* 1999; 35: 325-46
102. Winter JP, Calsyn RJ. The Dartmouth ACT Scale: a generalizability study. *Eval Rev* 2000; 24: 319-38
103. Clarke GN, Herinckx HA, Kinney RF, et al. Psychiatric hospitalizations, arrests, emergency room visits, and homelessness of clients with serious and persistent mental illness: findings from a randomized trial of two ACT programs vs. usual care. *Ment Health Serv Res* 2000; 2: 155-64
104. Bedell JR, Cohen NL, Sullivan A. Case management: the current best practices and the next generation of innovation. *Community Ment Health J* 2000; 36: 179-94
105. Baronet A, Gerber GJ. Psychiatric rehabilitation: efficacy of four models. *Clin Psychol Rev* 1998; 18: 189-228
106. Gorey KM, Leslie DR, Morris T, et al. Effectiveness of case management with severely and persistently mentally ill people. *Community Ment Health J* 1998; 34: 241-50
107. Herdelin AC, Scott DL. Experimental studies of the Program of Assertive Community Treatment (PACT): a meta-analysis. *J Disabil Policy Stud* 1999; 10: 53-89
108. Ziguras S, Stuart G. A meta-analysis of the effectiveness of mental health case management over 20 years. *Psychiatr Serv* 2000; 51: 1410-21
109. Mueser KT, Bond GR, Drake RE, et al. Models of community care for severe mental illness: a review of research on case management. *Schizophr Bull* 1998; 24: 37-74

110. Bond GR, Miller LD, Krumwied RD, et al. Assertive case management in three CMHCs: a controlled study. *Hosp Community Psychiatry* 1988; 39: 411-8
111. Bush CT, Langford MW, Rosen P, et al. Operation outreach: intensive case management for severely psychiatrically disabled adults. *Hosp Community Psychiatry* 1990; 41: 647-9
112. Chandler D, Meisel J, McGowen M, et al. Client outcomes in two model capitated integrated service agencies. *Psychiatr Serv* 1996; 47: 175-80
113. Fekete DM, Bond GR, McDonel EC, et al. Rural intensive case management: A controlled study. *Psychiatr Rehabil J* 1998; 21 (4): 371-9
114. Godley SH, Hoewing-Roberson R, Godley MD. Final Mentally Ill Substance Abusers report: technical report. Bloomington (IL): Chestnut Health Systems, 1994
115. Hampton B, Korr W, Bond GR, et al. Integration service system approach to avert homelessness: CSP Homeless Prevention Project for HMI Adults. State of Illinois NIMH Demonstration Grant Program: final report. Chicago (IL): Illinois Department of Mental Health and Developmental Disabilities, 1992
116. Jerrell J, Hu T-W. Cost-effectiveness of intensive clinical and case management compared with an existing system of care. *Inquiry* 1989; 26: 224-34
117. Lehman AF, Dixon LB, Kernan E, et al. A randomized trial of assertive community treatment for homeless persons with severe mental illness. *Arch Gen Psychiatry* 1997; 54: 1038-43
118. Marks IM, Connolly J, Muijen M, et al. Home-based versus hospital-based care for people with serious mental illness. *Br J Psychiatry* 1994; 165: 179-94
119. Merson S, Tyrer P, Onyett S, et al. Early intervention in psychiatric emergencies: a controlled clinical trial. *Lancet* 1992; 339: 1311-4
120. Morse GA, Calsyn RJ, Klinkenberg WD, et al. An experimental comparison of three types of case management for homeless mentally ill persons. *Psychiatr Serv* 1997; 48: 497-503
121. Quinlivan R, Hough R, Crowell A, et al. Service utilization and costs of care for severely mentally ill clients in an intensive case management program. *Psychiatr Serv* 1995; 46: 365-71
122. Rosenheck R, Neale M, Leaf P, et al. Multisite experimental cost study of intensive psychiatric community care. *Schizophr Bull* 1995; 21: 129-40
123. Salkever D, Domino ME, Burns BJ, et al. Assertive community treatment for people with severe mental illness: the effect on hospital use and costs. *Health Serv Res* 1999; 34: 577-601
124. Bond GR, McGrew JH, Fekete DM. Assertive outreach for frequent users of psychiatric hospitals: a meta-analysis. *J Ment Health Adm* 1995; 22: 4-16
125. Rapp CA. The active ingredients of effective case management: a research synthesis. *Community Ment Health J* 1998; 34: 363-80
126. Curtis JL, Millman EJ, Struening E, et al. Effect of case management on rehospitalization and utilization of ambulatory care services. *Hosp Community Psychiatry* 1992; 43: 895-9
127. Gomory T. Coercion justified? Evaluating the Training in Community Living model: a conceptual and empirical critique [dissertation]. Berkeley (CA): University of California, 1998
128. Thornicroft G. Testing and retesting assertive community treatment. [editorial] *Psychiatr Serv* 2000; 51: 703
129. Weaver P. The PACT model: no one best practice. In: National Association of State Mental Health Program Directors Research Institute Conference; 2000 Feb 13-15; Washington, DC; 2000
130. McGrew JH, Wilson R, Bond GR. Client perspectives on dissatisfying elements of assertive community treatment: a preliminary report. In: Annual Meeting of the American Psychological Association; 1994 Aug 8-12; Los Angeles (CA)
131. Diamond RJ, Wilder DI. Ethical problems in community treatment of the chronically mentally ill. *New Dir Ment Health Serv* 1985; 26: 85-93
132. Neale MS, Rosenheck RA. Therapeutic limit setting in an assertive community treatment program. *Psychiatr Serv* 2000; 51: 499-505
133. Clark RE, Teague GB, Ricketts SK, et al. Cost-effectiveness of assertive community treatment versus standard case management for persons with co-occurring severe mental illness and substance use disorders. *Health Serv Res* 1998; 33: 1285-308
134. The Lewin Group. Systems analysis of evidence-based assertive community treatment: state profiles and site-visit protocols [prepared for Health Care Financing Administration, and Substance Abuse and Mental Health Services Administration]. Falls Church (VA): The Lewin Group, 2000
135. Borland A, McRae J, Lycan C. Outcomes of five years of continuous intensive case management. *Hosp Community Psychiatry* 1989; 40: 369-76
136. Chandler D, Hu TW, Meisel J, et al. Mental health costs, other public costs, and family burden among mental health clients in capitated integrated service agencies. *J Ment Health Adm* 1997; 24: 178-88
137. Knapp M, Beecham J, Koutsogeorgopoulou V, et al. Service use and costs of home-based versus hospital-based care for people with serious mental illness. *Br J Psychiatry* 1994; 165: 195-203
138. Wolff N, Helminiak TW, Morse GA, et al. Cost-effectiveness evaluation of three approaches to case management for homeless mentally ill clients. *Am J Psychiatry* 1997; 154: 341-8
139. Wolff N, Helminiak TW. The anatomy of cost estimates – the ‘other’ outcome. In: Scheffler RM, Rossiter LF, editors. *Advances in health economics and health services research*. Greenwich (CT): JAI Press, 1993: 159-80
140. Hargreaves WA, Shumway M, Hu TW, et al. *Cost-outcome methods for mental health*. San Diego (CA): Academic Press, 1998
141. Essock SM, Frisman LK, Kontos NJ. Cost-effectiveness of assertive community treatment teams. *Am J Orthopsychiatry* 1998; 68: 179-90
142. Dincin J, Wasmer D, Witheridge TF, et al. Impact of assertive community treatment on the use of state hospital inpatient bed-days. *Hosp Community Psychiatry* 1993; 44: 833-8
143. Crane-Ross D, Roth D, Lauber BG. Consumers’ and case managers’ perceptions of mental health and community support service needs. *Community Ment Health J* 2000; 36: 161-78
144. Mueser KT, Goodman LB, Trumbetta SL, et al. Trauma and posttraumatic stress disorder in severe mental illness. *J Consult Clin Psychol* 1998; 66: 493-9
145. Weisbrod BA. A guide to benefit-cost analysis, as seen through a controlled experiment in treating the mentally ill. *J Health Politics Policy Law* 1983; 7: 808-46
146. Bond GR, Drake RE, Mueser KT, et al. An update on supported employment for people with severe mental illness. *Psychiatr Serv* 1997; 48: 335-46
147. Liberman RP, Kopelowicz A, Smith TE. Psychiatric rehabilitation. In: Kaplan BJ, Sadock VA, editors. *Comprehensive text-*

- book of psychiatry. 7th ed. Baltimore (MD): Williams & Wilkins, 1999: 3218-45
148. Mowbray CT, Moxley DP, Jasper CA, et al. Consumers as providers in psychiatric rehabilitation. Columbia (MD): International Association of Psychosocial Rehabilitation Services Publications, 1997
 149. Chinman MJ, Rosenheck R, Lam JA, et al. Comparing consumer and nonconsumer provided case management services for homeless persons with serious mental illness. *J Nerv Ment Dis* 2000; 188: 446-53
 150. Felton CJ, Stastny P, Shern DL, et al. Consumers as peer specialists on intensive case management teams: impact on client outcomes. *Psychiatr Serv* 1995; 46: 1037-44
 151. Lyons JS, Cook JA, Ruth AR, et al. Service delivery using consumer staff in a mobile crisis assessment program. *Community Ment Health J* 1996; 32: 33-40
 152. Paulson R, Herinckx H, Demmler J, et al. Comparing practice patterns of consumer and non-consumer mental health service providers. *Community Ment Health J* 1999; 35: 251-69

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