Assertive Community Treatment for People with Severe Mental Illness
Critical Ingredients and Impact on Patients

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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.[11] 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.[12] The number of residents in state mental hospitals declined from more than 550 000 to fewer than 90 000 by the 1990s.[13] Initial efforts at deinstitutionalization were a dismal failure, with high rates of patients being readmitted within a year of discharge.[14] 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.[15] 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.[16-19] 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’, ‘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-
Assertive Community Treatment

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Table I. Key principles of assertive community treatment

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
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<tr>
<td>Multidisciplinary staffing</td>
<td>Integration of services</td>
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<td>Team approach</td>
<td>Low patient-staff ratios</td>
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<td>Locus of contact in the community</td>
<td>Medication management</td>
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<td>Medication</td>
<td>Focus on everyday problems in living</td>
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<td>Substance abuse treatment</td>
<td>Rapid access</td>
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<td>Assertive outreach</td>
<td>Individualized services</td>
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<td>Time-unlimited services</td>
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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. By contrast, patients assigned case managers with individual caseloads may experience discontinuity in their therapeutic relationship whenever there is staff turnover. Test 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.

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. When caseloads are too large, case management services are clearly ineffective.

[10-12]

[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. Some of the key attributes, also listed in Table I, are described in the following sections.

[13,14]
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. In addition, assessment is more accurate in vivo 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. 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.

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 envisioned this program element to include 24-hour coverage. Witheridge suggested that “. . . staff often find ways to anticipate trouble and keep crises from erupting”, suggesting 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 and tangible help, especially with regard to finances and housing. Some ACT teams have a patient assistance fund to pay for emergency expenses.

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.

1.1.11 Time-Unlimited Services

In the Madison FACT 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. As suggested by more recent studies, 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 interventions with family members that are particularly appropriate for patients who have been discharged from their families.

Vocational Assistance

Fully staffed ACT teams hire part-time employment specialists who help patients find and retain jobs in integrated work settings.

1.2 Comparisons with Other Models

Case management by coordination, integration of limited resources, providing treatment and performing case management, ACT is discussed in the literature. ACT, it should be noted, is comprehensive service model.

The typical goal of preventing hospitalization and life, improving patient functioning, assessment, and treatment programs for ACT programs and resources used time sharply. Unlike ACT teams, case managers usually refer patients to other services and intervene directly. Both have individual caseloads.

ACT also differs from case management (ICM). The ICM model is that ACT has no single role like ICM, ACT has no single role on its essential ingredients, one core ingredient for ratios. One frequent between ACT and ICM team subscribe to the team and daily team meetings. These empirically confirm.
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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. Historically, the most common method for defining admission criteria was frequent or extensive use of psychiatric hospitals. Marshall and Creed 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. The second is as an alternative to admission for acutely ill patients, the so-called ‘deflection’ programs. Problems with deflection teams include potentially high staff burn-out and concerns about safety. 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, patients dually diagnosed with mental illness and substance use disorders or those with a legal involvement.

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).\textsuperscript{[159]}

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.\textsuperscript{[60]} These studies sought to enhance the transfer of skills taught in an exemplary hospital program to community life for discharged patients.\textsuperscript{[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.’\textsuperscript{[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\textsuperscript{[8]} involved defecting 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.\textsuperscript{[62]}

The study by Stein and Test\textsuperscript{[8]} has been hugely influential in mental health services research; it is probably the single most cited study in the literature on psychosocial treatment of mental illness in the twentieth century.\textsuperscript{[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,\textsuperscript{[113]} 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.\textsuperscript{[64]} Building on an earlier replication study completed in 1982,\textsuperscript{[65]} Michigan rapidly spread its version of ACT across the state.\textsuperscript{[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.\textsuperscript{[67]} A Michigan-based nonprofit organization, Assertive Community Treatment Association, Inc. (ACTA), sponsors an annual conference and provides ACT training, certification and networking.\textsuperscript{[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\textsuperscript{[69]} and public pronouncements, formation of a private corporation\textsuperscript{[70]} and setting a goal of ensuring ACT services in all 50 states by 2002.\textsuperscript{[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.\textsuperscript{[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-
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ion of ACT.[47,73] During the 1990s, an adaptation 
of ACT for very rural communities was also de
veloped.[74]

A 1995 telephone survey of 20 ACT experts iden
tified 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, of
ten generalist, teams with responsibility for ap
proximately 50 patients (i.e., proponents of the ACT 
adaptations in Michigan and Chicago).[12]

Since the 1990s, pressures toward cost-contain
ment have led to case management program designs 
that modify the ACT principle of time-unlimited 
services. Increasingly, program planners have adop
ted "Tiered" case management systems in which dif
ferent levels of case management intensity are aim
ed at different levels of patient needs.[75,76] Trans
ferring ACT patients to less intensive case manage
ment 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 administra
tors and program managers have increasingly ap
preciated the necessity of clear guidelines and sys

tematic 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 fac
tors 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 au
thorities have become aware of the need for com
munity services such as ACT.

An Australian program was one of the earliest 
replications of ACT.[84] Recently, Canadian provin
cial governments in Ontario[85] and Quebec[86] 
have developed plans for ACT dissemination. Other 
Canadian provinces have also developed ACT pro
grams.[86,87] More than 60 ACT programs now ex
ist throughout Canada, and Ontario now has an an
nual conference devoted entirely to ACT. In the 
UK, the incorporation of ACT principles into na
tional standards for case management has been de
bated.[88]

1.4.4 Practice Guidelines

The 1990s have brought an accelerating interest 
in "evidence-based practice" in all areas of medi
cine, including mental health.[89] A variety of 
governmental agencies and professional organiza
tions in North America issued practice guidelines rec
ognizing ACT as an evidence-based practice.[59,75,85,90] 
The most influential of these was the Schizophrenia 
Patient Outcomes Research Team guide
lines,[91] which recommended ACT services for 
patients with schizophrenia who are either at high 
risk for rehospitalization or are heavy service 
users. This widespread recognition has helped legiti
mize ACT.

Despite some promising trends in ACT disse
mination, actual practice patterns have lagged far 
behind. Lehman and Steinwachs[92] examined pat
terns of usual care for 719 people with schizophre
nia to determine conformance with treatment rec
ommendations.[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 es
tablished (and will vary according to the service 
system), this rate appears minuscule.

Managed care has accelerated the movement to
ward well-defined, evidence-based service mod
els. The objective in managed care is to base reim
bursement 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 re
sponsible for the reimbursement of healthcare for 
indigent people, to authorize ACT as a Medicaid
reimbursable treatment.[94] Several states have al
ready 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),[44] 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 ICM, 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 statistical 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 ACT studies[54,86,123] not previously considered.

Outcome domains are described in Table II. Readers are referred to the original papers for methodological details, including study description and fidelity of program implementation of types of control samples, and the median follow-up months. The control groups were diverse, although most studies used the ‘usual care’ (usually social case management).

In agreement with most reviews, we conclude that ACT substantially reduces hospital use, increases moderately improves occupational functioning, social functioning. Also, as discussed...
Table II. Significant outcomes for assertive community treatment in 25 randomized controlled trialsa

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Effectiveness of ACT compared with control conditions [no. of trials (%)]</th>
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<tr>
<td></td>
<td>better</td>
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<tr>
<td>Psychiatric hospital use</td>
<td>17 (74%)</td>
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<tr>
<td>Housing stability</td>
<td>8 (67%)</td>
</tr>
<tr>
<td>Symptoms</td>
<td>7 (44%)</td>
</tr>
<tr>
<td>Quality of life</td>
<td>7 (58%)</td>
</tr>
<tr>
<td>Social adjustment</td>
<td>3 (23%)</td>
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<tr>
<td>Jail/arrests</td>
<td>2 (20%)</td>
</tr>
<tr>
<td>Substance use</td>
<td>2 (33%)</td>
</tr>
<tr>
<td>Medication compliance</td>
<td>2 (50%)</td>
</tr>
<tr>
<td>Vocational functioning</td>
<td>3 (37%)</td>
</tr>
<tr>
<td>Patient satisfaction with services</td>
<td>7 (88%)</td>
</tr>
<tr>
<td>Family members' satisfaction with services</td>
<td>2 (67%)</td>
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</tbody>
</table>

Note: a Patient numbers in these studies ranged from 28 to 673, 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. [111], Bond et al. [36], Bush et al. [111], Chandler et al. [112], Drake et al. [113], Essock and Kontos [42], Fekete et al. [113], Godley et al. [114], Hampton et al. [115], Hoult et al. [116], Jerrell and Hu [116], Latrave et al. [117], Lehman et al. [117], Marks et al. [118], Marx et al. [119], Mars et al. [119], Morse et al. [120], Morse et al. [120], Mowbray et al. [121], Quintana et al. [121], Rosenheck et al. [122], Salkever et al. [123], Solomon and Draine [124], Stein and Test [8] and Test [12].

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\textsuperscript{[134]} to a greater extent than those receiving the usual services.\textsuperscript{[109]}

Nevertheless, it is worth noting that some critics of the ACT model\textsuperscript{[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,\textsuperscript{[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.\textsuperscript{[131]} One large-scale survey of ACT teams, which evaluated the use of therapeutic limits setting (interventions to pressure patients to change disturbing or destructive behavior or to stay in treatment),\textsuperscript{[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\textsuperscript{[133]} to \$US8244 (1994 values) in Baltimore,\textsuperscript{[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.\textsuperscript{[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.\textsuperscript{[46]} The impact of ACT on housing costs has been measured in a few studies, with inconsistent results.\textsuperscript{[62,135-137]} Homeless outreach programs typically show increased housing costs associated with movement from the streets and shelters toward more stable community housing.\textsuperscript{[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.\textsuperscript{[46]} The comprehensiveness of the costs measured and the methods used to measure costs vary greatly across studies.\textsuperscript{[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.\textsuperscript{[140]} These studies have reported higher cost-effectiveness ratios for ACT, although the differences were not always statistically significant.\textsuperscript{[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 services. To compensate for a reduced hospitalization, ACT services could be expanded to serve other individuals, but also with the costs reduced for an entire community of service unit serving a geographically defined population. The ACT model was successfully implemented in the USA. In one study, during a 9-month period, there was a linear trend of reduced hospitalization and institutionalization for ACT patients compared with controls.\textsuperscript{[142]}

### 4. The Future of Assertive Community Treatment

The 2 decades since the inception of ACT programs have been associated with the expansion and consolidation of ACT programs for different patient groups. The rapid growth of ACT programs has resulted from a variety of factors, such as the need for ACT to move beyond the experimental stage. ACT must include specialized clinicians, case managers, and other specialized professionals to address the multifaceted needs of patients with SMI. Without this specialization, ACT is unlikely to achieve its intended outcomes of improved employment, as previous studies have shown. ACT teams also require additional specialized programs such as assertive outreach for those serving the most symptomatic and treatment-resistant patients. Moreover, these specific ACT programs will require highly specialized skills and knowledge for the targeted population.

ACT programs of course are characterized by a number of common problems,\textsuperscript{[143]} such as retention of patients on the ACT team, training of ACT professionals, and the institutionalization of ACT teams. However, despite these problems, ACT programs are likely to continue to grow and evolve, as they have done in the past. The future of ACT programs will depend on the ability of ACT professionals to address these challenges, and to continue to develop new and innovative strategies for improving the outcomes of patients with SMI.
for those served by 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 medical 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

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Ratings/anchors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Human resources: structure and composition</td>
<td></td>
</tr>
<tr>
<td>H1 Small caseload: client/provider ratio of 10:1</td>
<td>50 clients/clinician or more</td>
</tr>
<tr>
<td>H2 Team approach: provider group functions as team rather than as individual practitioners; clinicians know and work with all clients</td>
<td>&lt;10% clients with multiple staff contacts in reporting week</td>
</tr>
<tr>
<td>H3 Program meeting: program meets frequently to plan and review services for each client</td>
<td>Program service-planning for each client usually occurs once/month or less frequently</td>
</tr>
<tr>
<td>H4 Practicing team leader: supervisor of front line clinicians provides direct services</td>
<td>Supervisor provides no services</td>
</tr>
<tr>
<td>H5 Continuity of staffing: program maintains same staffing over time</td>
<td>&gt;80% turnover in 2 years</td>
</tr>
<tr>
<td>H6 Staff capacity: program operates at full staffing</td>
<td>Program has operated at &lt;50% of staffing in past 12 months</td>
</tr>
<tr>
<td>H7 Psychiatrist on staff: there is at least 1 full-time psychiatrist per 100 clients assigned to work with the program</td>
<td>Program for 100 clients has &lt;0.10 FTE regular psychiatrist</td>
</tr>
<tr>
<td>H8 Nurse on staff: there are at least 2 full-time nurses assigned to work with a 100-client program</td>
<td>Program for 100 clients has &lt;0.20 FTE regular nurse</td>
</tr>
<tr>
<td>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</td>
<td>Program has &lt;0.20 FTE S/A expertise per 100 clients</td>
</tr>
<tr>
<td>H10 Vocational specialist on staff: the program includes at least 1 staff member with 1 year of training/experience in vocational rehabilitation and support</td>
<td>Program has &lt;0.20 FTE vocational expertise per 100 clients</td>
</tr>
<tr>
<td>H11 Program size: program is of sufficient absolute size to consistently provide the necessary staffing diversity and coverage</td>
<td>Program has &lt;2.5 FTE staff</td>
</tr>
</tbody>
</table>

Organizational boundaries

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Ratings/anchors</th>
</tr>
</thead>
<tbody>
<tr>
<td>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</td>
<td>Program has no set criteria and takes all types of cases as determined outside the program</td>
</tr>
<tr>
<td>O2 Intake rate: program takes clients in at a low rate to maintain a stable program environment</td>
<td>Highest monthly intake rate in the last 6 months = &gt;15 clients/month</td>
</tr>
<tr>
<td></td>
<td>The program makes an effort to seek and select a defined set of clients but accepts most referrals</td>
</tr>
<tr>
<td></td>
<td>The program actively recruits a defined population and all cases comply with explicit admission criteria</td>
</tr>
</tbody>
</table>
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

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

10-12

Program provides 3 or 4 of 5 additional services and refers externally for others

Program provides all 5 of these services to clients

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 2 of 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

All clients are served on a time-unlimited basis, with fewer than 5% expected to graduate annually

Nature of services

S1 In-vivo services: program works to monitor status, develop community living skills in vivo rather than in office

<20% time in community

20-30%

40-59%

60-79%

80-94%

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

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Ratings/anchors</th>
</tr>
</thead>
<tbody>
<tr>
<td>S3  Assertive engagement mechanisms: as part of ensuring engagement, program uses street outreach, as well as legal mechanisms (e.g., representative payees, probation/parole, OP commitment) indicated</td>
<td>Program passive in recruitment and re-engagement; almost never uses street outreach legal mechanisms</td>
</tr>
<tr>
<td>S4  Intensity of service: high total amount of service time as needed</td>
<td>Average of &lt;15 min/week or less per client</td>
</tr>
<tr>
<td>S5  Frequency of contact: high number of service contacts as needed</td>
<td>Average of &lt;1 contact/week or fewer per client</td>
</tr>
<tr>
<td>S6  Work with support system: with or without client present, program provides support and skills for client’s support network: family, landlords, employers</td>
<td>&lt;0.5 contact/month per client with support system</td>
</tr>
<tr>
<td>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</td>
<td>Clients with substance use disorders average &lt;3 minutes/week in substance abuse treatment</td>
</tr>
<tr>
<td>S8  Dual disorder treatment groups: program uses group modalities as a treatment strategy for people with substance use disorders</td>
<td>&lt;5% of the clients with substance use disorders attend at least 1 substance abuse treatment group meeting during a month</td>
</tr>
<tr>
<td>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</td>
<td>Program fully based on traditional model: e.g., mandates abstinence; higher power, etc.</td>
</tr>
<tr>
<td>S10 Role of consumers on treatment team: consumers are involved as members of the team providing direct services</td>
<td>Consumers have no involvement in service provision in relation to the program</td>
</tr>
</tbody>
</table>

#### Notes

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

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### Acknowledgments

We acknowledge the contributions of our colleagues and partners in the development and implementation of the Assertive Community Treatment (ACT) model.

### 5. Conclusions

As expected, older adults with severe mental illnesses living in the community are a high priority population for ACT. Close integration of the ACT team with other service systems is essential to maximize client outcomes. Our ongoing research and practice efforts continue to expand the evidence base for the success of ACT with this population.
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.

Acknowledgements

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