

COMMUNITY TREATMENT OUTCOMES
FOR PERSONS WITH SEVERE AND PERSISTENT MENTAL ILLNESS:
A THEORY-DRIVEN EVALUATION OF ASSERTIVE COMMUNITY TREATMENT

by

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(Under the Direction of Thomas P. Holland)

ABSTRACT

This study compares the efficacy and cost-effectiveness of two models of services for persons with severe and persistent mental illness, assertive community treatment and standard case management. A randomized experimental research design is used to evaluate outcomes and costs. A secondary objective is to carry forward the exploration of linkages between case management program ingredients and outcomes through use of a theory-driven evaluation approach.

Study subjects included persons with a history of severe, persistent mental illness and failure to benefit from office-based treatment indicated by high inpatient treatment use. One hundred-fifty persons evidencing these criteria were randomly assigned for outreach efforts. The first twenty-five persons engaged by each of the program constituted the study groups.

Multiple were measured, including inpatient treatment and crisis service use symptomatology functioning, quality of life, and service satisfaction and cost-effectiveness. The theory-driven evaluation approach examined five outcome mediator variables including program structure, service, frequency and intensity, medication compliance, and strength of client-case manager working relationship.

Multivariate analyses indicated no significant difference between programs for only one outcome indicator. Standard case management evidenced stronger client-case manager working relationships than assertive community treatment.

Regression analyses indicated strength of the client-case manager working relationship is a significant predictor of positive change in inpatient treatment and crisis service use functional status, quality of life, medication compliance, and service satisfaction.

Study findings indicate evidence of efficacy and cost-effectiveness may not be sufficient to support the movement of assertive community treatment into standard practice. Further research is needed for a direct comparison of the efficacy and cost-effectiveness of the intensive case management and assertive community treatment program models, and to test which program ingredients are empirically linked to outcomes. The theory-driven approach would be well suited to that research objective.

INDEX WORDS: Assertive community treatment, Case management, Mental illness, Theory-Driven Program Evaluation, Social Work, Community Mental Health Services

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A Dissertation Submitted to the Graduate Faculty of
The University of Georgia in Partial Fulfillment of the
Requirements for the Degree

DOCTOR OF PHILOSOPHY

ATHENS, GEORGIA

2004

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DEDICATION

This work is dedicated to my family, Marianne and Andrew, and to my parents. Their support of my continuing education and professional goals has and will continue to motivate and inspire me.

ACKNOWLEDGEMENTS

First and foremost, I would like to acknowledge the DeKalb Community Service Board leadership and staff whose participation made this study possible. Support received from the following individuals in particular is sincerely appreciated: Dr. Derril Gay, Gary Richey, Carol Sandiford, Willa Presmanes, Delphenia Davis, Donnie Bryant, Brenda Jones, and Sid Weaver.

The steadfast support and assistance of my major professor, Dr. Thomas P. Holland, is greatly appreciated. The advice and encouragement of other School of Social Work faculty and staff, Dr. James Gaudin, Dr. Roberta Greene, Dr. Allie Kilpatrick, Ms. Marty Lund, Dr. Ray MacNair, Dr. Larry Nackerud, Dr. Ed Risler, and Dr. Bruce Thyer, is also gratefully acknowledged. The consultative assistance of Dr. Jaxk Reeves, Statistics Department, was very helpful for completion of data analysis components of the study. I would also like to acknowledge the support and encouragement of Dr. Laura Tyler, Michael Bird, and other colleagues at Georgia Mountains Community Services.

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CHAPTER I

INTRODUCTION

Specific Aims

The primary objective of this study was to compare outcomes for persons with severe and persistent mental illness served by an assertive community treatment program and a standard case management program. A secondary objective is to demonstrate the usefulness of theory-driven evaluation research for identifying the critical program components or active ingredients that underscore effectiveness.

Significance

In recent years, a significant amount of research on assertive community treatment and case management for persons with severe and persistent mental illness has been conducted to validate widespread beliefs in the efficacy and cost-effectiveness of these services. Reviews of these studies note contradictory and inconclusive findings attributable to methodological limitations of the research designs utilized.

Among a myriad of limitations the most often identified are lack of experimental controls, low statistical power due to small study sample sizes and subject attrition, short study duration, lack of program implementation analysis and specification of contextual factors (Bond, McGrew, & Fekete, 1995; Olfson, 1990; Ridgely & Willenbring, 1992; Taube, C., Morlock, L., Burns, B., & Santos, A., 1990). Strengthening the knowledge base on these

service delivery models is needed for the continued improvement of community treatment services for persons with severe and persistent mental illness (Bacharach 1989; Belcher, 1992; Bond, McGrew & Fekete, 1995; McGrew, Wilson, & Bond, 1996).

Background

Severe and persistent mental illnesses (SPMI), including schizophrenic, bipolar, and major affective disorders, are the most debilitating and pernicious of all psychiatric disorders. Persons with SPMI are among the most vulnerable members of society. Between one-half and two-thirds of SPMI patients are unable to work, live independently, or maintain adequate social relationships. Persons with these illnesses frequently suffer a painful awareness of their disability, resulting in severe anguish, depression, and a high rate of suicide. An estimated 4.8 million persons in the United States are afflicted. The illnesses follow a chronic, progressively deteriorating, lifelong course in approximately 50 percent of cases (Kessler et al., 1996; Bellack & Blanchard, 1993).

The economic burden of the disease on families and on society is enormous. Although the illnesses affect only 1.3 percent of the adult population, it comprises over 10 percent of the permanently and severely disabled population and consumes about 2.5 percent of total U. S. health care expenditures. Total U. S. economic costs of severe and persistent mental illnesses, including direct treatment costs, lost productivity; criminal justice and welfare administration costs were estimated to be

\$95.4 billion in 2000. The average annual economic cost is about \$19,900 per patient (National Institute of Mental Health, 2000).

Case management services for the chronically mentally ill evolved as a consequence of the movement to develop community-based programs and deinstitutionalize the treatment of mental illness, which began in the 1950s out of concern about the living conditions, as well as the enormous expense of long-term, custodial hospital care. Unfortunately, deinstitutionalization left thousands of chronic mental patients to fend for themselves in community systems of care, which were either inadequate or complex and fragmented. Since resistance to or failure to comply with treatment and rehabilitation regimens and frequent relapse are salient characteristics of the disease, costly "revolving door" patterns of homelessness, frequent hospitalizations and criminal justice system interventions occur (Belcher, 1988).

Problem statement

Empirical evidence exists that intensive case management services, such as assertive community treatment, provided within a continuum of comprehensive community mental health services, may effectively address this problem by assessing individual needs, planning, linking, coordinating and monitoring services, by providing supportive psychotherapy services, and by providing advocacy and outreach to increase service access and plan compliance (Belcher, 1992).

In 1992, the U.S. Department of Health and Human Services Agency for Health Care Policy and Research (AHCPR) and National Institute of Mental Health (NIMH) funded the Patient Outcomes

Research Team (PORT) project to identify evidence-based practices for the treatment of severe and persistent mental illness. Subsequent to the initiation of this study, the PORT study and several governmental agencies and professional organizations endorsed assertive community treatment as an evidence-based practice for the treatment of severe and persistent mental illness (Lehman & Steinwachs, 1995; Baronet & Gerber, 1998; Bond et al., 2001; Bustillo et al., 2001).

In 1999, the U.S. Health Care Financing Administration authorized ACT as a Medicaid reimbursable service (First White House Conference on Mental Health, 1999). Data on the efficacy and cost-effectiveness of the prototype and early replications resulted in widespread dissemination of ACT services. By 1997 there were approximately 397 ACT programs operating in the United States with annual expenditures of approximately \$157 million dollars, half of which was funded by Medicaid (Gomory, 1999).

Research on ACT efficacy and cost-effectiveness has also continued to grow. Results of recent studies have not provided consistent support, however, for the replicability of the findings of original and early evaluation studies justifying the PORT recommendations. These findings have perpetuated concerns about the transportability of ACT. Outcomes of model programs such as ACT may be attributable as much to contextual variables such as community demographics and availability of other needed services, as to program ingredients. Evidence of generalizability to other communities is demonstrated by the consistent positive results of replications. Inconsistent and contradictory findings

of recent replication studies argue against movement of the ACT model into standard practice as called for by proponents (Bond et al., 2001; Phillips et al., 2001).

ACT proponents have attributed the negative findings of recent replications more to implementation fidelity than to contextual factors (Dixon, 2000; Bond et al., 2001; Minghella, Gauntlett, & Ford, 2002). Others believe methodological inadequacies of ACT evaluation studies preclude positive findings (McHugo et al., 1998). At least one staunch critic maintains that original studies were methodologically flawed (Gomory, 1999). Questioning whether the designation of the ACT model as an evidence-based practice by the PORT study may have been premature seems reasonable. There is a need to strengthen the evidence-base (Holloway & Carson, 2001).

In particular, many analyses of the empirical evidence call for evaluative studies with increased specification of "exactly what program characteristics lead to which client outcomes for which clients, and at what cost." "Unfortunately, mental health services research generally does not have this level of precision, and this may have resulted in a discounting of the positive findings that have been reported in the literature" (Bond, Mueser, & Fekete, 1995, p. 14).

This observation may aptly apply to health care services in general. Health care quality assurance experts may indicate a similar observation that research on the effective linkage of structure and process to outcome and cost effectiveness is virtually nonexistent (Donabedian, 1990; O'Leary, 1988). The

challenges of designing evaluative research to provide an adequate database to support accountability, comparability, generalizability, and the continuous improvement of the quality of treatment or a program of services are consonant.

A theory-driven approach may facilitate this convergence and strengthen the database available for program accountability, monitoring, and continuous improvement (Bickman & Peterson, 1990; Chen & Rossi, 1992; McGrew, Bond, Dietzen, & Salyers, 1994; Mowbray, Cohen, & Bybee, 1991; Peterson & Bickman, 1992; Scott & Sechrest, 1992). In addition to the objective of expanding and strengthening the empirical database on efficacy and cost-effectiveness of assertive community treatment and case management programs, a secondary objective of this study is to assess the potential of the theory-driven approach to evaluation.

Research Hypotheses

Nine hypotheses and eight sub-hypotheses will be tested. These hypotheses address the outcome and cost-effectiveness expectations of program stakeholders and the theoretical relationship believed to exist between specific program ingredients or components and outcomes.

Hypothesis 1

1.1. There will be a statistically significant reduction in State psychiatric hospitalization and community-based crisis service (outpatient crisis intervention and short-term residential crisis stabilization) utilization rates for persons served.

1.2. Comparison of program outcome differences will indicate a greater reduction in utilization for persons served by the assertive community treatment program than for persons receiving standard case management program.

Hypothesis 2

2.1. There will be a statistically significant improvement in quality of life for persons served.

2.2. Comparison of program outcome differences will indicate greater gains for persons served by the assertive community treatment program than for persons receiving standard case management services.

Hypothesis 3

3.1. There will be a statistically significant reduction in symptom severity for persons served.

3.2. Comparison of program outcome differences will indicate greater gains for persons served by the assertive community treatment program than for persons receiving standard case management services.

Hypothesis 4

4.1. There will be a statistically significant improvement in the level of functioning of persons served.

4.2. Comparison of program outcome differences will indicate greater gains in level of functioning for persons served by the assertive community treatment program than for persons receiving standard case management services.

Hypothesis 5

There will be a statistically significant difference between programs in client satisfaction with services, with comparisons of program outcome differences indicating a higher level of satisfaction for persons served by the assertive community treatment program than for persons receiving standard case management services.

Hypothesis 6

6.1. There will be a statistically significant difference between programs in the strength of the working alliance between clients and service providers. Comparison of program differences will indicate a stronger working alliance between persons served and providers of assertive community treatment services than for persons receiving standard case management services.

6.2. It is further hypothesized that the strength of the working alliance will be positively associated with outcome indicators.

Hypothesis 7

7.1. There will be a statistically significant difference between programs in level of medication compliance attained. Comparison of program differences will indicate higher levels of medication compliance for assertive community treatment clients than for standard case management clients.

7.2. It is further hypothesized that medication compliance levels will be positively associated with outcome indicators.

Hypothesis 8

8.1. There will be a statistically significant difference between programs in the frequency of service contacts provided. Comparison of program differences will indicate greater frequency of service contacts for assertive community treatment clients than for clients receiving standard case management services.

8.2. There will be a statistically significant difference between programs in intensity of services provided. Comparison of program differences will indicate greater intensity of services for assertive community treatment clients than for clients receiving standard case management services.

8.3. It is further hypothesized that service contact frequency and intensity will be positively associated with outcome indicators.

Hypothesis 9

The assertive community treatment will be cost-effective compared to standard case management. Cost-effectiveness would be demonstrated by attainment of greater levels of positive change in outcome indicators at equal or lower cost than standard case management. Cost-effectiveness would also be demonstrated by equivalent levels of positive change in outcome indicators at lower cost.

CHAPTER II

LITERATURE REVIEW

Objectives

This literature review has three objectives. The first objective is to briefly review historical foundations of case management. The second objective is to review descriptions of case management service delivery models. The third objective is to review and critique findings of empirical studies evaluating the efficacy and cost-effectiveness of, and consumer satisfaction with, case management services for individuals with severe and persistent mental illness (SPMI).

Historical Foundations of Case Management

Case management originates from social casework or traditional social work intervention that focused on poor and disadvantaged people struggling with basic survival needs (Hall et al., 2002; Rosen & Teeson, 2001; Schilling, Schinke, & Weatherly, 1988; Weil & Karls, 1985). According to Weil and Karls (p.4) "the roots of case management in the United States can be traced as far back as 1863", and originated for the purposes of the coordinating human services for the care of poor, sick, and disadvantaged persons while ensuring conservation of public funds. Social casework was based on values of

respect for individual worth and dignity, and emphasized empowerment of vulnerable populations (Weil & Karls, 1985). Six basic functions have been associated with social casework: education, coordination of care, resource use, monitoring, advocacy, and resource development (Johnson & Rubin, 1983). Although the functions and goals of modern case management are comparable to early social casework, modern case managers are typically less involved in the lives of persons served than their predecessor caseworkers (Hall et al., 2002). Over the past twenty years, vestiges of early casework have re-emerged through the innovation of more intensive, comprehensive care models of case management for persons with severe and persistent mental illness, such as assertive community treatment.

Conceptual Models of Case Management

Definitions

For the purposes of this theory-driven evaluation, the term conceptual model is defined as the set of assumptions, methods, processes, structures, and goals that guide the intervention, and in this case represents published accounts or constructions how case management is supposed to work (Bickman, 1987; Chen, 1990; Worthen, 1996). The three basic elements of program theories or conceptual models include (1) specifications of goals (program target population, context conditions, and problem area or behavior to be addressed by the

program); (2) structures and processes (content and interventions) that are sufficient to produce desired effects (i.e. active ingredients), and (3) outcomes (responses or effects of program interventions (Lipsey, 1993; Reynolds, 1998)).

Early conceptualizations of case management program goals focused on the coordination of a fragmented system of care for persons disabled by mental illness. More recently, it has come to be viewed as a service which can help disabled people function in the least restrictive, most normal environment and achieve an improved quality of life. Although there has been widespread implementation of case management, there is no standardized definition. Case management is a heterogeneous concept used both in mental health as well as in other health and social service sectors. Consensus on definition of case management as it is practiced in the care of severely and persistently mentally ill persons does not yet exist (Aviram, 1990; Bachrach, 1992, 1993; Burns, 1996; Chamberlain & Rapp, 1991; Fisher, Landis, & Clark, 1988; Kanter, 1989); Loomis, 1988; Raiff & Shore, 1993; Worley, Drago, & Hadley, 1990).

Bachrach's (1989) definition emphasizes the interactive nature of case management and describes the relationship between a consumer and case manager as the requisite ingredient. Teaching and resource enhancement are identified by Ballew and Mink (1986) as key elements

of case management. Linz, McAnally, and Wieck (1989) include advocacy, monitoring, and coordination in their definition of case management. The concept is also described by Pilling (1992) as emphasizing need assessment, service planning, service arrangement, monitoring and evaluation as the central aspects of case management. Others have identified case management as a system of care (Miller, 1983; Weil et al., 1985). Regardless of the definition, case management usually involves some standard processes or functions.

Moxley (1988) defines case management as the creation of a support network for the client, and identified five primary functions of case management: (1) assessment, (2) planning, (3) direct and indirect intervention, (4) monitoring, and (5) evaluation. Vourlekis and Greene (1991) add client identification and outreach, and distinguish advocacy as a distinct function rather than assume that it occurs as a part of the intervention function described by Moxley (1988).

Intagliata (1982, p. 657) defines case management as a process or method for ensuring that clients are "provided whatever services they need in a coordinated, effective, and efficient manner". The specific meaning of case management though, depends on the system that is developed to provide it and the particular characteristics of that system are "shaped by the context in which is expected to operate" (Intagliata, 1982, p.

657). As suggested by Schwartz, Goldman, and Churgin (1982, p. 1006) the "term case management is like a Rorschach test. An individual, an agency, or a community will project onto case management its own particular solution to the problems it faces in providing community-based care for the chronic mentally ill".

Typologies of case management models

Consequent to the lack of consensus on the definition of case management, a variety of typologies for service delivery models in the literature for human services (Ellison et al., 1995; Weil & Karls, 1985). Schwartz, Goldman and Churgin (1982) suggest that case management approaches can be grouped along three dimensions: case manager role, caseload, and authority. The first dimension encompasses the role of case manager and addresses the level of involvement in the direct provision of service. The second dimension is concerned with the size and type of caseload of the case manager. Caseloads range in size and may be constituted of relatively homogeneous of individuals or groups that are best described as diverse on the basis of age, diagnosis, severity of illness, and other clinical and demographic factors. The third dimension relates to the source and magnitude of authority or control that the case manager has over services and resources including administrative, legal, fiscal, and clinical authority.

Rubin (1992) identified the presence of 13 different case management models (generalist, specialist, therapist-case manager, family, psychosocial rehabilitation center, supportive care, volunteer case manager, assertive, intensive, rehabilitation-oriented, developmental-acquisition, personal strengths, and clinical case management models). These models have been grouped as one of six general types (Mueser et al., 1998): brokerage or networking (Bachrach, 1992; Harris & Bergman, 1993; Lamb, 1980); clinical (Kanter, 1989); rehabilitation (Anthony & Farkas, 1988; Bachrach, 1992; Goering et al., 1988); personal strengths (Rapp & Chamberlain, 1985); intensive case management (Shern et al., 1989; Surles et al., 1992) and full support or assertive community treatment (Test & Stein). These groupings are similar to those suggested by the Mental Health Policy and Resource Center (1995), Raiff and Shore (1993) and Solomon (1992).

Further refinement of case management typology reduces service delivery models to three broad types (Mueser et al., 1998): (1) Standard case management models, (2) comprehensive care models, and (3) rehabilitation-oriented models. These broad types are used to organize the following review of the distinguishing conceptual frameworks of extant case management service delivery program service delivery structures.

Standard case management models

What is now referred to as "standard case management" evolved in the United States in conjunction with the mental health system reforms associated with the deinstitutionalization movement initiated in the 1950s and continuing now. Early experiences with this change of "the locus of care for persons with severe mental illness from hospital to community". . "showed that the relevant service system was complex and fragmented. Moreover, persons with SMI demonstrated a limited ability to advocate for themselves and to initiate and coordinate contacts with multiple service providers" (Drake, 1998). Consequently, persons discharged from long-term care institutions had great difficulty getting needed services and evidenced high rates of hospital recidivism and criminal justice system incarceration (Mechanic, 1991). Between episodes of hospitalization or incarceration, quality of life was generally poor for these patients.

To respond to the inadequacies, complexities, and fragmentation of community systems of care, case management was invented to assist patients in accessing and coordinating needed services (Anthony et al., 1988; Drake, 1998; Stein, 1992). Since the 1970s, a variety of models for case management services for persons with severe mental illness have been developed. Standard case management incorporates brokerage and clinical case

management models. The brokerage model was the first to be articulated (Intagliata, 1982).

The brokerage model, alternately designated "networking" model (Bachrach, 1989; Harris & Bergman, 1987; Kanter, 1989), includes five core components: needs assessment, planning, linking, monitoring, and advocacy. Case managers operating within this model do not provide clinical services directly (Intagliata, 1982). Emerging early in the era of deinstitutionalization reforms, the primary purpose of this model was to address service access problems (Moore, 1990).

As limitations of this model became apparent, other models of case management emerged. Most limitations derive from faulty assumptions upon which the model was implemented. One faulty assumption is that the range of expertise and services are available in the community and linkage was all that was needed. Another is that when available services are linked, they will be integrated in a collaborative manner appropriate to the client's needs. With these assumptions being rarely true, case managers were expected to compensate for service system inadequacies by providing some of the clinical services (Stein, 1992).

The fact that case managers must often provide direct clinical services prompted development of the clinical case management model (Deitchman, 1980; Lamb, 1980; Harris and Bergman 1987). In addition to the five

core components of the brokerage model, clinical case managers are expected to provide crisis intervention, individual psychotherapy on an intermittent basis, training in independent living skills, and psychoeducation.

As case managers assumed a more comprehensive participation in patients' lives, the need to address the issue of optimal caseload size required attention. Under the brokerage model, caseload sizes averaged ratios of forty and fifty patients per case manager, whereas under the clinical case management model caseload sizes vary on the basis of several factors: clients' functional status, symptom stability and risk factors, and availability of community resources (Kanter, 1989). Clients with severe and persistent mental illness could not be successfully engaged in treatment and continued to evidence high hospitalization and emergency service use rates when served at caseload ratios of forty or more clients per case manager. In response to these problems, the "intensive clinical case management model" was developed (Surles & McGurkin, 1987; Shern et al., 1989; Stein, 1992; Surles, 1992).

Under intensive case management models with caseload ratios of between ten and twenty to one, the availability of case managers to provide monitoring, supportive psychotherapy, and crisis intervention was expanded to address the high level of need presented by this

treatment-resistant and refractory client population. Concerns that increased levels of intensity exacerbated case manager burnout and turnover, and disrupted continuity of care led to the development of "team case management", a modification of the clinical case management model that specified shared caseloads (Aberg-Wistedt et al., 1995; Degen et al., 1990; Fiorentine & Grusky, 1990).

In addition to structural considerations regarding caseload size and assigning individual staff or team responsibility for persons served, concerns about the range of skills and expertise needed by case managers also arose. The set of responsibilities assigned to case managers "to help persons with severe and persistent mental illness live stable lives of decent quality" were perceived as "too complex to be successfully carried out by one professional discipline" (Stein, 1992, p. 174). Addition of multidisciplinary staffing and shared caseloads to intensive case management is the hallmark of comprehensive care models.

Comprehensive care models

Comprehensive care models are based in varying degrees on the Training in Community Living Program (TCL) model designed in the 1970s by Stein and Test (1975, 1980) as an alternative to the hospital for persons with mental illness presenting for inpatient care (Solomon, 1992). Whereas hospital diversion was the focus of TCL,

the focus shifted to post-discharge relapse prevention services for persons with severe and persistent mental illness when replaced by the Program of Assertive Community Treatment (PACT).

Case management programs implemented in accordance with the comprehensive care model have been called "hospitals with walls" (Burns & Swartz, 1994). Comprehensive care programs attempt to provide almost all necessary services without being dependent of referral or brokering of services. A comprehensive range of treatment, rehabilitation, and social services are provided by multidisciplinary teams containing specialists in critical areas, such as psychiatric, nursing, substance abuse and vocational rehabilitation professionals, as well as generalist case managers. In addition to use of multidisciplinary staffing other structural components of this model, include:

- Low client to staff ratios, generally 10 - 15 per case manager
- Continuous care including assertive outreach and frequent contact with clients to maintain adequate engagement in treatment and rehabilitation services
- Crisis coverage 24 hours per day/7 days per week
- Services delivered *in vivo*, in the community at clients' residence, work, learning or social environment
- Skills training and practical supports for activities of daily living, such as shopping, nutrition, laundry, and money management

- Assistance with symptom management including medication regimen adherence
- Social skills training and facilitation of a supportive social and family environment
- Assistance with locating and maintaining appropriate work

The degree of emphasis on use of a multidisciplinary team approach with shared caseloads is the primary distinction between the comprehensive care model and intensive clinical case management (Holloway & Carson, 2001; Schaedle et al., 2002). Use of multidisciplinary staffing enable the program to provide most of the community treatment and supports needed, if not be the sole provider of services.

Rehabilitation-oriented models

Rehabilitation-oriented case management program models represent another variation of intensive clinical case management (Anthony et al., 1988, 1993; Goering, 1988; Modrcin et al., 1985; Rapp, 1993; Sullivan, 1992; Weick et al. 1989;). These models are distinguishable by the degree of program content and interventions focusing on psychoeducation, independent living skills training, and development of natural community supports.

Although comprehensive care models indicate rehabilitative goals, outcome evaluation reports of weak impacts on psychosocial functioning prompted innovation of rehabilitation-oriented case management. Operating principles of the model stress the importance of a

collaborative case manager-client partnership that focuses more on the client's strengths, assets, and potential, and less on pathology, symptoms, and limits; more on personal goals, less on mental health system goals (Solomon, 1992).

Efficacy of Case Management

Overview

The variety of case management models described in the previous section emerged "as a natural, evolutionary process in the care of persons with severe mental illness" (Mueser et al., 1998, p. 64). Notwithstanding the complexities involved in the sanctioning and dissemination of service delivery practices, and as discussed in the introductory chapter, this evolutionary process has been data-driven. Supported by data supplied by over seventy controlled studies since 1980, significant progress has been made toward the identification of evidence-based practices for providing case management services for persons with severe and persistent mental illness. This section provides a brief overview of the mission of case management and reviews published research evidence of efficacy in achieving outcome goals related that mission.

Case management mission and goals

The overall mission of case management programs has been defined as enhancement of the continuity, accessibility, effectiveness, and efficiency of care

(Intagliata, 1982). A survey of program administrators indicated the most important goals within that overall mission are to prevent hospitalization and to improve quality of life and capacity for independent functioning (Ellison et al., 1995). Since first appearing in the health and social service literature in the early 1980s, a large volume of research has been conducted on the efficacy of case management in achieving these goals (Forchuk et al., 2002).

A variety of outcome indicators have been utilized to measure the effectiveness of case management in achieving its mission and goals. The most frequently used indicators include impact of services on hospital utilization, symptomatology, level of functioning (instrumental skills and role performance); quality of life (health and safety, housing, vocational and financial status, criminal justice system involvement, general life satisfaction and satisfaction with specific life domains); family or caretaker burden; and consumer satisfaction with services. The impact of case management on health and social service system engagement (e.g., compliance and drop-out rates), and cost-effectiveness has also been evaluated.

The findings of outcome evaluations of case management efficacy and cost-effectiveness have been contradictory, and limited in ability to provide guidance to policy makers for allocation of resources.

Contradictory evaluation findings have been attributed to several factors, including variations in the definition, structure and delivery of case management services, as well as by lack of uniform or universally accepted indicators of expected outcomes.

As evidenced by the commitment of substantial amounts of governmental funding for case management services for persons with mental illness, some consensus exists about the relative merit of case management in comparison to more restrictive treatment alternatives. To assess experimental evidence of the efficacy of assertive community treatment (Olfson, 1990) reviewed the findings of eleven randomized trials and repeated-measures studies. The conclusion of this review was that, excepting the reduction of hospital utilization; evidence of efficacy for other goals of case management was limited. Taube, Morlock, Burns, and Santos (1990) determined that assertive community treatment evidenced cost-effectiveness based on a review of five experimental and quasi-experimental studies.

Solomon (1992) assessed twenty studies and Rubinbach (1992) assessed eight studies covering a range of program types representing all three basic models of case management. With conclusions consistent with those of Olfson, Solomon expressed the view that support for case management was "largely based on anecdote, clinical observation, considerations about appropriate clinical

practice, and, to a limited extent, on scientific evidence". Rubinbach concluded, "claims that case management has been empirically demonstrated to be effective appear to be premature" (p. 148).

Since these four reviews, scientific evidence has expanded significantly. During the past ten years, seven more synoptic reviews and five meta-analytic reviews of research evaluating case management services for persons with severe mental illness have been reported. A brief discussion of meta-analytic versus the synoptic approach to data synthesis will precede the summation and conclusions about efficacy and cost-effectiveness gleaned from these reviews.

The use of meta-analysis to synthesize research data is regarded as a major advance in the evolution of evidence-based practices for behavioral healthcare and for health services in general (Leff & Mulkern, 2002). Meta-analysis is defined as a

"means of combining the numerical results of studies with disparate, even conflicting, research methods and findings, it enables researchers to discover the consistencies in a set of seemingly inconsistent findings and to arrive at conclusions more accurate and credible than those presented in any one of the primary studies. More than that, meta-analysis makes it possible to pinpoint how and why studies come up with different results, and so determine which treatments - circumstances or interventions - are most effective and why they succeed" (Hunt, 1997, 1ff).

The advantage of meta-analysis, compared to synoptic or narrative-type reviews, is that it provides an unbiased

method for the systematic analysis of data from uncoordinated studies.

Systematic reviews of scientific evidence

Literature searches (MEDLINE & PsycINFO) located eleven synoptic reviews of research on case management efficacy (Olfson, 1990; Taube, 1990; Rubinbach, 1992; Solomon, 1992; Holloway, Oliver, Collins, & Carson, 1995; Rapp, 1995; Burns & Santos, 1995; Scott & Dixon, 1995; Baronet & Gerber, 1998; Mueser, Bond, Drake, & Resnick, 1998; Latimer, 1999) and four meta-analytic reviews (Bond, Mueser, & Fakete, 1995; Gorey et al., 1998; Marshall et al, 1998, 1999; Ziguras and Stuart, 2000). Eighty-eight studies published since 1972 were encompassed by these reviews (assuming identification of all overlapping analyses). All studies selected for these reviews employed experimental designs, with nearly half using randomized assignment of subjects.

All three types of case management program models (standard, comprehensive care, and rehabilitation-oriented) were covered by one or more of the studies, with the majority (60%) evaluating the efficacy of comprehensive care programs (e.g. assertive community treatment, assertive outreach, continuous treatment team, and intensive psychiatric community care programs). The range of outcome indicators addressed by the studies include measures of impact on psychiatric hospital utilization rates, quality of life, housing stability,

level of functioning (global and instrumental/role performance skills), social adjustment, vocational status, symptomatology, substance abuse, treatment engagement (e.g., compliance and drop-out rates), criminal justice system involvement (arrests, incarcerations, legal contacts), client satisfaction with services, and cost-effectiveness.

Findings of the synoptic and meta-analytic reviews will be summarized separately for each outcome domain, and then compared. For some of the outcome domains, reviews were inconclusive regarding evidence of efficacy due to contradictory or insufficient data. Therefore, the percent of reviews that were inconclusive regarding efficacy for specific outcomes will be identified as well as the percent indicating whether there was or was not evidence of efficacy.

Due to the low number of studies on the efficacy of rehabilitation-oriented case management programs and lack of evidence that brokerage-type case management is effective for any of the outcome domains, conclusions regarding conclusions are restricted to clinical case management and comprehensive care programs. Another exclusion is the Bond, Mueser, and Fakete (1995) meta-analysis since it focused exclusively on studies of the efficacy of comprehensive care programs.

Psychiatric Hospitalization Rates

Comprehensive care programs: 75 percent of synoptic reviews and 100 percent of meta-analyses indicated comprehensive care programs are efficacious in reducing hospital readmission rates, 25 percent of synoptic reviews were inconclusive. None of the reviews indicated inefficacy for this indicator.

Standard case management: None of the synoptic reviews and 67 percent of meta-analyses indicated efficacy for reducing hospitalization rates, with 33 percent of meta-analyses indicating standard case management was efficacious for this indicator.

Symptomatology

Comprehensive care programs: 25 percent of synoptic reviews and 33 percent of meta-analyses indicated comprehensive care programs are efficacious for reducing symptoms; 75 percent of synoptic reviews and 33 percent of meta-analyses were inconclusive; 33 percent of meta-analyses indicated inefficacy for this indicator.

Standard case management: None of the synoptic reviews and 25 percent of meta-analyses indicated efficacy for reducing symptoms, with 12.5 percent of synoptic reviews and 25 percent of meta-analyses indicating inefficacy; 87.5 percent of synoptic reviews and 33 percent of meta-analyses were inconclusive.

Level of functioning

Comprehensive care programs: 38 percent of synoptic reviews and 67 percent of meta-analyses indicated comprehensive care programs are efficacious for improving level of functioning; 50 percent of synoptic reviews and none of the meta-analyses were inconclusive; 12 percent of synoptic reviews and 33 percent of meta-analyses indicated inefficacy.

Standard case management: None of the synoptic reviews and 67 percent of meta-analyses indicated efficacy for improving level of functioning; none of the synoptic reviews and 33 percent of meta-analyses indicated inefficacy; 100 percent of synoptic reviews and none of the meta-analyses were inconclusive.

Quality of life

Comprehensive care programs: 12.5 percent of synoptic reviews and 33 percent of meta-analyses indicated comprehensive care programs are efficacious for improving quality of life; 75 percent of synoptic reviews and 67 percent of meta-analyses were inconclusive; 12.5 percent of synoptic reviews and none of the meta-analyses indicating inefficacy for this indicator.

Standard case management: None of the synoptic reviews and 33 percent of meta-analyses indicated efficacy for improving quality of life, with none of the reviews indicating inefficacy; 100 percent of synoptic

reviews and 67 percent of meta-analyses were inconclusive.

Treatment engagement

Comprehensive care programs: 38 percent of synoptic reviews and 100 percent of meta-analyses indicated comprehensive care programs are efficacious for maintaining treatment engagement; 62 percent of synoptic reviews and none of the meta-analyses were inconclusive; none of the reviews indicated inefficacy.

Standard case management: None of the synoptic reviews and 100 percent of meta-analyses indicated efficacy for maintaining treatment engagement, with 38 percent of synoptic reviews and none of the meta-analyses indicating inefficacy; 62 percent of synoptic reviews and none of meta-analyses were inconclusive.

Client satisfaction

Comprehensive care programs: 38 percent of the synoptic reviews and 67 percent of meta-analyses indicated comprehensive care programs evidenced high or improved client satisfaction with services; 62 percent of synoptic reviews and 33 percent of meta-analyses were inconclusive; none of the reviews indicated evidence of low or reduced client satisfaction with services.

Standard case management: None of the synoptic reviews and 33 percent of meta-analyses indicated standard case management programs evidenced high or improved client satisfaction with services, none of the

reviews indicated evidence of low or reduced client satisfaction with services; 100 percent of synoptic reviews and 33 percent of meta-analyses were inconclusive.

Cost effectiveness

Comprehensive care programs: 38 percent of the synoptic reviews and 100 percent of meta-analyses indicated comprehensive care programs were cost-effective; 62 percent of synoptic reviews and none of the meta-analyses were inconclusive; none of the reviews indicated evidence that comprehensive care programs are not cost-effective.

Standard case management: None of the synoptic reviews and 67 percent of meta-analyses indicated standard case management programs were cost-effective, 12.5 percent of synoptic reviews and 33 percent of meta-analyses indicated standard case management was not cost-effective; 87.5 percent of the synoptic reviews and none of the meta-analyses were inconclusive.

Summary

These research reviews indicate a significant amount of concurrence that case management is efficacious for the following outcomes: reducing psychiatric inpatient utilization rates, improving functioning and housing stability, improving treatment engagement, improving or evidencing high client and family satisfaction with services, reducing family burden, and reducing cost.

Specific areas evidencing or lacking consensus on efficacy will be discussed.

A majority of synoptic reviews and all three meta-analytic reviews indicated that comprehensive care case management reduce hospitalization readmission rate. Two of the meta-analyses (Gorey et al, 1998; Ziguras & Stuart, 2000) indicated standard case management programs also reduces hospitalization readmission rates, but that comprehensive care is comparatively more effective. Two meta-analyses (Gorey et al., 1998; Ziguras & Stuart, 2000) indicated both models of case management improve level of functioning and both are cost-effective. Efficacy of comprehensive care programs for improving housing stability was also indicated by two meta-analyses (Gorey et al, 1998; Marshall & Lockwood, 1999).

All three meta-analyses indicate both models are effective in maintaining treatment engagement. Two meta-analyses (Marshall & Lockwood, 1999; Ziguras & Stuart, 2000) indicate comprehensive care programs improve client satisfaction or evidence high client satisfaction with services. The Ziguras and Stuart review also found evidence of family satisfaction with services and reduced burden.

A majority of the synoptic or meta-analytic reviews found inadequate evidence that either model of case management demonstrates effectiveness for the following outcome goals: improving quality of life and vocational

status, reducing symptoms, criminal justice system involvement and substance abuse. These negative findings may be attributed as much to lack of research data and to equivocal findings that are contradictory or ambiguous, as to clear findings of ineffectiveness.

A significant overall limitation of available data on case management efficacy is that it focuses predominantly on comprehensive care models, especially assertive community treatment. Many of these studies test the efficacy of the comprehensive care model using standard case management services as the comparison or control group rather than assignment to standard outpatient treatment services without case management. (Bond et al, 2001).

Equivocal findings on efficacy for many of the outcomes goals of case management represent additional limitations and gaps in the research data. Explanations of equivocal findings identify a multitude of conceptual and methodological issues encumbering case management evaluation research and creating scientific uncertainty about efficacy. A frequently cited cause of equivocal findings is lack of program implementation fidelity.

Program Implementation Fidelity

Program or treatment "efficacy is proven when clearly specified interventions have been shown to be beneficial in controlled research with a delineated population" (Chambless & Hollon, 1998; Rosen & Teeson,

2001). A manual or equivalent would be utilized to ensure the program or treatment structures, content and processes are replicated with an optimal degree of fidelity to the model being tested.

Although progress has been made toward the development of criteria to monitor and measure case management program implementation fidelity (McGrew et al., 1994; Salyers et al., 2003; Teague et al., 1998), current evidence on efficacy is based on the findings of "black box" type evaluation research designs. "Black box" designs do not incorporate implementation analysis, review of the amounts and types of specific services provided, and specification of contextual factors that can mediate or moderate the effects of program interventions (Finney & Moos, 1989).

Currently available tools for the monitoring of case management program implementation include criteria for structural components derived from expert opinion surveys, not from the empirical identification of critical ingredients. Critical ingredients would include specific program structures, content or processes that are linked to program outcome goals. The need for research focusing on the identification of the critical or active program ingredients has been an oft-repeated concern of case management outcome evaluation studies (Baronet & Gerber; Burns & Perkins, 2000; Holloway &

Carson, 2001; McHugo et al., 1998; Mueser et al., 1998; Solomon, 1992; etc.)

A limited amount of empirical evidence exists as a basis for hypotheses regarding the linkage of specific case management program structures, components and processes to outcomes. Theoretical outcome linkages have been posited for the following potentially active or critical ingredients: program structure (Tyler, 1997; Gorey et al., 1998; McHugo et al., 1999; Tyrer, 2000); frequency and intensity of case manager-client contacts (Dietzen & Bond, 1993; Brekke et al., 1997, 1999; Ryan, Sherman, & Bogart, 1997); and quality of case manager-client relationship (Gehrs & Goering, 1994; McCabe et al., 1999; Mueser et al., 1998; Neale & Rosenheck, 1995; Solomon, Draine, & Delaney, 1995).

A distinguishing feature of this study is the objective of advancing understanding of specific program ingredients or components that define and underscore effective assertive community treatment and case management. This feature complements the primary objective of contributing to the knowledge base on the comparative efficacy and cost-effectiveness of alternative models of case management.

CHAPTER III

STUDY DESIGN AND METHODS

This chapter describes the study setting, details the study design and methodology, and concludes with an assessment of study limitations and strengths.

Setting

The programs evaluated by this study are components of a comprehensive community mental service system operated by the DeKalb Community Service Board based in Decatur, Georgia. The geographic area served by the organization is a metropolitan county that includes a portion of the City of Atlanta. Over 6,000 persons with severe and persistent mental illness are served annually.

In addition to assertive community treatment and case management, the range of services provided by the organization include outpatient counseling and medication management, psychosocial rehabilitation services including clubhouse, supported employment, and supported housing, partial hospitalization and day treatment including specialized addictions and dual diagnosis services, and 24-hour crisis services. Crisis services include a mobile crisis program and short-term residential crisis stabilization.

Assertive Community Treatment

The ACT Program, established in 1994, was the first implemented in the State of Georgia. The program had been in

operation approximately 18 months at the time the evaluation study was initiated. The ACT team was staffed to serve 50 clients at 10 to 1 client to staff ratio.

ACT Program staffing was comprised of a full-time team leader (masters-level social worker) spending 50% of time providing direct services, a psychiatric nurse, an addictions counselor (masters-level), 2 generalist counselors (masters-level), and part-time psychiatrist (5 hours per week). Psychiatrist back up for the team was available on a 24-hour, 7-day per week basis. The ACT Program was staffed with intent to provide the majority of services needed. Psychosocial rehabilitation program services supplemented ACT services for some clients.

Case Management Program

The organization's case management program had been in operation several years prior to establishment of the ACT Program. Case management services were designed in accordance with criteria specified for "Dedicated Case Management" (DCM) by the primary funding source, Georgia Department of Medical Assistance Medicaid Program. Program services focused on individual client needs assessment and planning, advocacy and linkage to needed services, monitoring and evaluation of appropriateness and effectiveness of services received. In addition to this service brokerage-type assistance, DCM staff provided supportive counseling and psychotherapy, and help with basic needs and activities of daily living.

The DCM Program was staffed to serve 210 persons at a client to case manager ratio of 35 to 1. Team staffing consisted of a full-time director (masters-level social worker) and six full-time case managers (4 masters-level social workers and 2 paraprofessional counselors).

Study Design

A randomized experimental design enhanced by the theory-driven evaluation approach, was utilized (Boruch & Wottke, 1985; Chen & Rossi, 1983; Chen, 1990; Rossi & Freeman, 1993). Chen (1990) subscribes to the definition that program theory is a set of propositions regarding how a program is supposed to work, and is essentially descriptive. Lipsey (1993) refers to such propositions as "small theory" to be contrasted with "large theory" of general social or biological phenomena. Chen & Rossi (1989) distinguish a theory-driven approach from an atheoretical method-driven approach. The latter approach emphasizes internal validity over external validity and neglects replicability, a critical feature of the scientific method. The method-driven approach has been labeled the "black box" approach, because it focuses on observing and measuring inputs and outputs, and provides a narrow, sometimes distorted understanding of program throughputs, the implementation process complexities (Cook & Shadish, 1986; Finney & Moos, 1989; Graham & Birchmore-Timney, 1989; Lipsey, 1993; Scott & Sechrest, 1989).

A theory-driven, experimental program evaluation design, such as the one proposed, attempts to provide both the methodological rigor and statistical power necessary to reduce

"Type I", "Type II", and what Dobson & Cook (1981) designated as a "Type III" error, measuring the effects of a program that does not exist or has been inadequately implemented. Theory-driven approaches emphasize multivariate analyses to explicate linkages between the nature, strength, and integrity or fidelity of implementation processes and outcomes, enhancing both internal and external validity of impact assessments, as well as to fulfill program quality assurance objectives and prevent "program drift" (Bond, 1991; Brekke, 1987; Cook & Shadish, 1986; McGrew, Bond, Dietzen, & Salyers, 1994; Scott & Sechrest, 1989).

Four types of theory to guide program evaluations: theories of the disorder, theories of treatment, theories of treatment selection processes, and theories of patient-treatment matching (Finney and Moos, 1992). Theories of the disorder (mental illness) and theories of treatment (case management) guided the program evaluation. Three approaches to constructing program theory: the stakeholder approach (Wholey, 1987; Wood, 1993), the social science approach (Chen and Rossi, 1983), and the integrative approach have been identified (Chen (1990). The integrative approach was taken in this study proposal. Key stakeholders were interviewed to solicit their assumptions and values about the relationships among program resources, program processes, and intended outcomes, and the existing social science knowledge base on case management services for chronic mental illness was reviewed.

Finney & Moos (1992, pp. 20-21) indicate that "theories of psychological disorders fall into at least two classes,

etiological theories and relapse theories", and that theories of treatment are both "normative" and "causative" in nature. Normatively, treatment theories "indicate the treatment components that should be linked with specific outcome variables--relationships that can be examined in treatment process analyses. Causative treatment theories "specify relevant intervening variables or processes that mediate treatment effects. Probing such theory provides a basis for making inferences about the generalizability of results", as noted earlier.

Theories of the etiology of mental health emphasizing biological factors (such as heritable abnormalities of brain physiology) are currently the most widely accepted. While not viewed as a major causal factor, socioenvironmental stressors, in combination with this genetic vulnerability, are hypothesized to play a role in illness onset, response to treatment, and episodic relapse. The stress-vulnerability model of schizophrenia attempts to integrate the two broad models of etiology, the biological and environmental, both of which have empirical research support (Bellack & Blanchard, 1993; Nicholson & Neufeld, 1992; Yank, Bentley, & Hargrove, 1992; Zubin & Spring, 1977; Zubin, Steinhauer, & Condray, 1992).

Although preventive and curative interventions are not available, there is empirical support for specific treatment and rehabilitative modalities to ameliorate symptomatology, reduce rate of relapse, and increase capacity for independent functioning. In general these modalities involve the combined

utilization of psychotropic medication, supportive psychotherapy, and environmental supports such as supervised housing, and independent living skills training. All of these modalities include a critical role for case management (Baker & Intagliata, 1992; Belcher, 1992; Corrigan, Liberman, & Engel, 1992; Sarti & Cuornos, 1990; Mueser & Berenbaum, 1990).

In accordance with the vulnerability/stress model of mental illness, these interventions seek to reduce vulnerability and stress by increasing coping skills and providing environmental support. Combined pharmacological and psychosocial treatment is necessary because although medications are effective in reducing the "positive" symptoms (hallucinations, delusions, abnormal thought form, and bizarre behavior), pharmacotherapy are not able to significantly reduce the "negative" (or deficit) symptoms, which represent the absence of behaviors or abilities that normal persons demonstrate. The "negative" symptoms (poverty of speech, blunted affect, social withdrawal, and low motivation) may be effectively treated with supportive psychotherapies (Breslin, 1992).

Supportive psychotherapy encompasses reality-adaptive, task-oriented, psychoeducational, social skills training, and problem-solving approaches. These approaches focus on behavior rather than on meaning or insight development characteristic of psychodynamic approaches which lack scientific support for efficacy in mental illness treatment (Bellack & Mueser, 1993; Drake & Sederer, 1986; Goering & Stylianos, 1988; Mueser & Berenbaum, 1990). Neligh and Kinzie (1983, p. 73) listed the

goals of supportive psychotherapy with the chronically mentally ill patient as: "promoting the patient's self esteem and confidence, making the patient aware of personal limitations and the limitations of treatment; crisis intervention and relapse prevention, and preventing undue dependence and enabling the patient to function with appropriate professional help".

Supportive psychotherapy approaches emphasize positive behaviors, warm acceptance of or positive regard for the patient, including listening, complimenting, joking, advising and providing information, and is an active, assertive approach to engaging the patient in a trusting, collaborative working alliance to motivate the patient and increase treatment compliance (Corrigan, Liberman, & Engel, 1990; Neligh & Kinzie, 1983). Although there is a variety of case management models for chronic mental illness, all include varying degrees of these supportive psychotherapy features and emphasize the importance of case managers developing a strong working alliance with clients (Bacharach, 1989; Bond, Miller, Krumwied, & Ward, 1988; Goering & Stylianios, 1988; Kanter, 1989; Stein & Test, 1980).

Evaluation of the "Training in Community Living" (TCL) model (Stein, Test, & Marx, 1975; Stein & Test, 1980), the first controlled study that demonstrated the effectiveness of community-based treatment and rehabilitation services for chronic mental illness (and for schizophrenia in particular), provided a model for case management intervention. The TCL model has been a prototype for several similar implementations and replications (Bond, McGrew, & Fekete, 1995; Test, 1992). Stein and Test (1980)

indicated, however, that their study examined the entire program of care without evaluating the separate effects of case management. Although they were not able to specify what factors were responsible for the success of the program, they hypothesized that the core case management team's intensive involvement "in vivo" with patients, providing supportive psychotherapy services, rather than referral, was a significant contributing factor to the positive results of the program. Case management in the TCL model, not simply a "resource coordinator" function, included direct provision of assertive outreach and supportive psychotherapy services which are not clearly specified or measured in accounting for program effectiveness in the original and successor studies.

The innovative case management program to be evaluated is based on the TCL model, and is designated as an assertive community treatment program (ACT) by stakeholders. The proposed study compares the efficacy and cost-effectiveness of this program with a standard case management program operated within the same community mental health service organization.

Although the programs are similar with regard to provision service brokerage and supportive psychotherapy, they differ on use of a multidisciplinary team staff, use of shared caseloads, and on caseload size. With significant differences in caseload size, the programs differ on relative proportion of service needs met instead of brokered by the program. With significantly different caseload sizes, there was also a significant difference in the planned intensity and frequency of services to be provided

per client. Theory construction interviews and review of the knowledge base indicate that these program component or ingredient differences should explain variances in case management service outcomes and cost.

A study by Dietzen and Bond (1993) of assertive case management services for the chronically mentally ill determined that a minimum intensity of services may be necessary to reduce relapse rates, but that service intensity is not linearly related to client outcomes. This finding reflects the results of research reviewed by Drake and Sederer (1986) which emphasize the importance of managing the content (restricting to supportive psychotherapy approaches) as well as titrating the intensity of psychotherapeutic treatment of chronic schizophrenia (analogous to managing medication dosage), a critical factor in the quality of case management services. For example, frequent contact of short duration may be more effective than infrequent contact of longer duration. Whereas that study correlated intensity of case management services with hospitalization rates, this study evaluated the relationship of service frequency and intensity with other outcome indicators to be specified.

Stakeholder interviews and review of the literature identified two additional intervening or process variables: strength of the client-case working relationship, and level of client medication compliance. The development and maintenance of the working alliance is viewed as a critical factor in the success of case management services (research indicating that the strength of the alliance is strongly associated with patient

treatment compliance and variances in outcome) a measure of this intervening response variable was included in the evaluation research design (Coady, 1993; Gehrs & Goering, 1994; Drake & Sederer, 1986; Harris & Bergman, 1986, 1988; Horvath & Symonds, 1991; Wasylenki, Goering, Lancee, Ballantyne, & Farkas, 1985).

Dietzen and Bond (1993) observed that a limitation in their study and other evaluations on assertive case management services is that the factor of case manager skill and the quality of case management contact, of supportive psychotherapy services or the working alliance is not assessed, and remains the unspecified variable to which Stein and Test (1980) attributed program success.

Case manager attention to patient symptomatology monitoring, medication management and compliance issues is also viewed as critical factor in realizing program objectives. Although the quality of the working alliance influences medication compliance, research indicates a correlation between the subjective response of the patient to medication effects and therapeutic outcome and medication compliance (Hogan, Awad, & Eastwood, 1983; Awad, 1993; Corrigan, Liberman, & Engel, 1990). Since case managers are actively involved in monitoring symptomology and medication compliance and effects, a measure of this intervening variable, patient subjective response to medications as an indicator of the quality of medication management, was also included in the design.

Study Methodology

The objectives of this section are to specify study subject selection procedures; to specify outcome indicator measures and criteria used for selection of measures; to specify measures and data sources for program implementation ingredients; to review the psychometric properties of the standardized measures selected; and to outline data collection and analysis procedures.

Subject Selection Procedures

The case management programs evaluated are partial coverage programs with established caseload capacities. The study target population included over 150 severely and persistently mentally ill persons meeting two outreach criteria. The first criterion was hospitalization rate. Persons selected for outreach evidenced one or more admissions during the six-month period preceding program implementation and two or more admissions during the preceding twelve months period, or at least sixty inpatient days during the preceding 12 months period at a State psychiatric hospital.

The second selection criterion was current treatment status. Persons selected for outreach had not been actively engaged in any community mental health services, excepting emergency or crisis services, during the preceding three months. From the target group listing, one half to each program was randomly assigned to assertive community treatment (ACT) and standard case management (SCM) for outreach efforts to admit as many cases as possible to services to constitute experimental and control groups respectively.

Outcome Indicators and Measures

As in the selection of intervening or process variables, the theory-driven approach to selecting the dependent variables entailed stakeholder interviews and review of the knowledge base. Six indicators of the efficacy of case management services were identified: psychiatric inpatient treatment and crisis services utilization rates, quality of life, medication compliance, symptomatology, level of functioning, and satisfaction with services. Standardized measures of program outcome indicators include: The Brief Psychiatric Rating Scale, BPRS (Overall & Gorham, 1962; Hafkenscheid, 1991, 1993) to measure clinical status; the Global Assessment of Functioning Scale, GAF (Endicott, Spitzer, Fleiss, & Cohen, 1976) to measure functional status; and the Quality of Life Interview QOLI (Lehman, 1988) to measure objective indicators of quality of life; the Satisfaction with Life Domains Scale SWLD (Baker & Intagliata, 1982) to measure subjective indicators of quality of life.

Outcome measures also included the Client Satisfaction Questionnaire, CSQ-8 (Larsen, Attkisson, Hargreaves, & Nguyen, 1979) to measure satisfaction with services and the Working Alliance Inventory, WAI-12, (Horvath & Greenberg, 1986; Tracey & Kokotovic, 1989) to measure strength of the client-case manager working relationship. The Drug Attitude Inventory, DAI-10, (Awad, 1993; Hogan & Awad, 1992; Hogan, Awad, & Eastwood, 1983) was used to measure medication compliance level.

Program Implementation Indicators and Measures

For measurement of program implementation fidelity the

Index of Fidelity of Assertive Community Treatment (IFACT) was utilized (McGrew, Bond, Dietzen, & Salyers, 1994). Organization accounting and billing records were used to provide data to measure fidelity to standards for the frequency and intensity of service contacts. Program outcome and implementation fidelity variables and data sources are summarized in Table 1.

Selection of Standardized Measures

Survey of the program evaluation and research literature indicated that selected standardized instruments have been utilized in other published evaluations of community support

Table 1. Client demographic and clinical characteristics, program outcome and implementation variables, measures, and data sources.		
Variables	Measure	Data Source
Demographic & Clinical Characteristics		
Client demographic characteristics	Gender, race, age, education level; marital and vocational status.	Client service records
Client clinical characteristics	Diagnosis and public mental health system service use history	Client service records
Clinical Outcome Variables		
State psychiatric hospitalization rate	Number of admissions and length of stay	Client service records
Community-based residential crisis stabilization use rate	Number of admissions and length of stay	Client service records
Outpatient crisis intervention service use rate	Number of outpatient and mobile crisis service use events	Client service records
Psychiatric symptom severity level	Psychiatrist administration of Brief Psychiatric Rating Scale (BPRS)	Client service records
Level of functional	Case manager administration of the Global Assessment of Functioning Scale (GAF).	Client service records
Medication compliance level	Program evaluator administration of the Drug Attitude Inventory (DAI-10)	Client service records
Strength of client-case manager working relationship	Program evaluator administration of Working Alliance Inventory (WAI-12)	Client service records

Table 1 (continued). Client demographic and clinical characteristics, program outcome and implementation variables, measures, and data sources.		
Variables	Measure	Data Source
Quality of Life Indicators		
Arrest and victimization rates (number of incidents during previous 12 months)	Case manager administration of the Quality of Life Inventory (QOLI) Scale on Legal & Safety Issues	Client service records
Level of participation in activities of daily living and self-rated level of functioning	Case manager administration of the QOLI Daily Activities and Functioning Scale	Client service records
Extent & severity of physical health problems	Case manager administration of the QOLI Health Scale	Client service records
Level of family involvement (frequency of interaction)	Case manager administration of the QOLI Family Relations Scale	Client service records
Level of socialization (frequency of interaction)	Case manager administration of the QOLI Social Relations Scale	Client service records
Residential stability & homelessness rates (number of different residences and homeless episodes during previous 12 months)	Case manager administration of the QOLI Living Situation Scale	Client service records
Employment level (average number of hours worked)	Case manager administration of the QOLI Work & School Scale	Client service records
Overall objective quality of life (percent of optimal)	QOLI subscale scores (percent of optimal) divided by total of optimal QOLI subscale scores.	Client service records
Subjective Quality of Life & Satisfaction with Services		
Variables	Measure	Data Source
Subjective quality of life	Program evaluator administration of the Satisfaction with Life Domains Scale (SWLD)	Client service records
Satisfaction with services	Program evaluator administration of the Consumer Satisfaction Questionnaire (CSQ-8)	Client service records
Program Implementation & Cost-Effectiveness		
Implementation fidelity	Program evaluator administration of the Index of Fidelity of Assertive Community Treatment (IFACT)	Program evaluator interviews
Service contact frequency & intensity	Average weekly & monthly contact events and hours per client	Client service records

Table 1 (continued). Client demographic and clinical characteristics, program outcome and implementation variables, measures, and data sources.		
Program Implementation & Cost-Effectiveness (continued)		
Variables	Measure	Data Source
Service costs	Mental health system cost per case calculated as follows: Case management per capita cost (total program costs divided by caseload capacity) plus outpatient and rehabilitation service cost (service units used times cost per unit) plus inpatient treatment costs (psychiatric hospital and residential crisis stabilization days used times per diem cost).	Billing and accounting records

services for the chronically mentally ill, thereby enhancing the generalizability and comparability of study findings. Utilizing recommended criteria for evaluating the usefulness of standardized instruments (Green & Gracely, 1986; Fischer & Corcoran, 1994; Manchanda, Hirsch, & Barnes, 1989) a review of the published evidence of psychometric properties indicated utility for valid, reliable, sensitive, relevant and appropriate measurement, and the instruments were relatively easy and economical to administer and score. The psychometric properties of these measures will be summarized.

Brief Psychiatric Rating Scale

The Brief Psychiatric Rating Scale (BPRS) was developed to provide a comprehensive but rapid evaluation instrument to assess patient response to treatment. The 16-item original version of the scale, which was derived from 2 other scales (the Lorr Multidimensional Scale for Rating Psychiatric Patients and Lorr Inpatient Multidimensional Psychiatric Scale) based on how

sensitive they were in measuring changes in the patient's overall condition during psychiatric treatment, was later expanded to an 18-item version. The authors indicate that each of the psychiatric symptom areas represented by scale items is identified with a construct which has high consensual (content) validity among professionally trained persons in psychiatry and psychology, but did not address criterion or construct validity. Inter-rater reliability was evaluated, indicating Pearson Product Moment correlation values ranging from .56 to .87 (averaging .78) for items on the original scale (Overall and Gorham, 1962).

Recent assessments of the psychometric properties of a 10-item schizophrenia subscale derived from the BPRS supported factorial and discriminant validity, intra-rater and inter-rater reliability (Hafkenscheid, 1991, 1993). Overall and Gorham (1962) provided standardized interview procedures, detailed definitions of scale items and descriptions of rating concepts to enhance effective use of the instrument, and indicate that use by trained, experienced clinicians is essential for high reliability. The BPRS is one of the most well established scales in psychiatric treatment outcome research with international use in hundreds of studies. It is frequently used to establish the validity of other measures.

Drug Attitude Inventory

The Drug Attitude Inventory, DAI-10 (Hogan, Awad, & Eastwood, 1983; Hogan & Awad, 1992; Awad, 1993) was developed to measure the construct of subjective response and compliance of persons with schizophrenia receiving neuroleptic medication

therapy. Developers of the DAI reported that a reliability analysis of the responses of 150 patients with schizophrenia indicated high internal consistency. Convergent validity was demonstrated by comparing DAI scores with the scoring of another instrument measuring subjective response to medications developed by Van Putten and May (1978). Correlation between the two scales was statistically significant ($r = .76$, $p < .001$ at first measure; $r = .74$ at repeat measure).

Discriminant (predictive) validity of the DAI was demonstrated by a strong positive correlation of DAI scores, measured at the time medication is initiated, and clinical change measured by the Brief Psychiatric Rating Scale (Overall & Gorham, 1962) and the Global Assessment Scale (Endicott, Spitzer, Fleiss, & Cohen, 1976) following several weeks of treatment.

Global Assessment of Functioning Scale

The Global Assessment Scale (GAF), derived from extensive modification of the Menninger Health-Sickness Rating Scale (HSRS), was developed to assess overall mental health and level of functioning as an alternative to the multidimensional scales that measure several psychiatric symptom dimensions to produce a more sensitive measure of differential treatment effects. The authors (Endicott, Spitzer, Fleiss, & Cohen, 1976) indicate that the validity and reliability of the HSRS was established on the basis of data from 18 published studies correlating HSRS ratings with measures of adequacy of personality functioning, severity of symptoms, quality of interpersonal relationships, prediction of improvement in psychotherapy, and treatment outcome. The GAF was

developed to be a less cumbersome instrument than the HSRS. GAF items are well defined and scoring is simple with scale values ranging from one, which represents the hypothetically sickest individual, to 100, the hypothetically healthiest.

Evaluation of the reliability of the GAF indicated inter-rater reliability with Pearson Product Moment Correlation Coefficients between .69 and .91 with an associated standard error of measurement indicating about 95% confidence that a rating given a patient will be within 10 or 11 points on the 100 point scale of being the patient's "true" rating. Examining the correlations of GAF ratings supported concurrent validity and two other measures of severity of psychopathology (Mental Status Examination Record and Psychiatric Status Schedule) in a study of psychiatric hospital patients evaluated on admission and six months later. GAF ratings were moderately correlated (Pearson r values of .37 & -.44 at admission, -.62 & .67 at six months) with the overall severity of illness scores indicated by these two measures.

GAF ratings were also compared with reports of family members using the Family Evaluation Form (FEF) to inquire about the family member's knowledge of the patient's psychopathology. Although the authors indicate that the GAF ratings evidenced "good concordance" with the FEF scores at time of hospital admission at which time most patients were no longer hospitalized, the Pearson r values do not indicate strong correlations (-.25 & -.19 at the time of admission and -.52 and -.45 six months later).

Evidence of predictive validity was provided by comparing the GAF scores at 3 months following admission with hospital readmission rates during the subsequent 3, 6, and 9 month periods. The authors indicated that "virtually all" readmissions had GAF scores below 40.

The sensitivity of the GAF to change was also evaluated by comparing the GAF rating with PSS, FEF, and MSER global ratings using the ϵ (epsilon) statistic (a summary statistic similar to the correlation coefficient) to measure the sensitivity of each of the 3 scales to change in patient status occurring during the 6-month period following hospital admission. The ϵ statistic value indicated higher sensitivity of the GAF, ($\epsilon = .75$ to $.83$) compared with the multidimensional scales ($\epsilon = .75$ for PSS, $.67$ for FEF, and $.47$ for MSER).

The GAF has also been used extensively in mental health service outcome studies, and suitability of use with schizophrenic persons has been demonstrated (Green & Gracely, 1987). The caveat that the GAF should not be used entirely on its own because it does not distinguish clinical aspects of patient functioning and should be used as a summary measure, complementary to a multidimensional scale (Thompson, 1992), is observed by the planned concomitant use of the Brief Psychiatric Rating Scale. The rationale for selection of this scale is that global ratings provide a mechanism to integrate the diverse goals and multidimensional patient characteristics which are typically

addressed by comprehensive service delivery programs such as case management (Lehman, 1980).

Quality of Life Interview

The Quality of Life Interview (QOLI) was designed specifically to evaluate the impact of community-based treatment, rehabilitation, and support services for the chronically mentally ill (Lehman, 1988). The QOLI is one of only three instruments for assessing the quality of life of chronically mentally ill persons, which have established psychometric properties. Lehman indicates the instruments all propose to measure a construct based on the "general quality of life theory, which integrates access to resources, fulfillment of social roles in multiple life domains, satisfaction with life in various domains, and general life satisfaction into a multivariate model of well-being".

The QOLI includes an objective and subjective scales focusing on the following life domains: quality and stability of housing, frequency of family contacts, frequency of social contacts, number of leisure activities, employment status, financial status, physical functioning, role functioning, social functioning, safety and legal issues.

The QOLI was validated with 3 patient samples: 278 mentally ill residents of 30 large boarding homes in Los Angeles; 99 chronically ill inpatients at the Rochester (NY) Psychiatric Center; and 92 chronically mentally ill residents of various supportive living residences in Rochester, NY. All three samples were between the ages of 18 and 65, selected on a systematic random basis.

Internal consistency was comparable across samples and deemed adequate (most Cronbach alphas exceeded .70) for research purposes. One-week test-retest indicated significant levels of stability for most items and scales (most of the Pearson r values exceeded .70). Content, construct, and predictive validity have been assessed and will be summarized.

Content validity is based on author's derivation of interview items "from a wide variety of relevant existing measures in the mental health and general quality of life literature". Factor analyses supported a central factor for each scale (alphas = .67 to .70).

Construct validity was based on three sets of correlations: intercorrelations (range of Pearson r values .02 to .61) of objective and subjective QOLI measures within each life domain (e.g. correlation of frequency of family contacts with satisfaction with family relations); correlations of demographic variables, domain-specific objective QOLI measures, and domain-specific subjective measures with general life satisfaction; and correlations of general life satisfaction scores with measures of patient psychopathology. Depression ($r = -.17$ to $-.56$) and anxiety ($r = -.25$ to $-.33$) showed negative correlations with general life satisfaction. Thought disorder symptoms did not correlate with general life satisfaction ($r = .06$ to $-.14$). Based on these findings the author indicated that concomitant assessment of a respondent's level of psychiatric symptoms, especially depression and anxiety, is advisable. Use of the

Brief Psychiatric Rating Scale in this study will observe this caveat.

Predictive validity was evaluated by comparing the overall predictive capacity of the multivariate QOLI conceptual model which links personal characteristics, objective QOLI indicators in life domains, and subjective QOLI indicators in life domains to global well-being in the patient populations with the model's performance in the general population. The authors employed a four-stage, step-wise multivariate regression of general life satisfaction on four predictor variables: (1) demographics; (2) diagnoses (3) objective, domain-specific QOLI measures; and (4) subjective, domain specific QOLI measures. The analysis indicated that a similar pattern of predicted variance was present across the three patient populations, and that the effective predictive performance of the model compared with similar analyses from the general population was demonstrated (Lehman 1988).

Satisfaction with Life Domains Scale

The Satisfaction with Life Domains Scale (SLDS) (Baker & Intagliata, 1982) is a measure of respondent satisfaction with various areas of life. The validity and reliability of the scale was evaluated in a study of the quality of life of 118 chronic psychiatric patients receiving community treatment and support services. Evidence of validity was provided by a statistically significant correlation of SLDS scores with the Bradburn Affect Balance Scale (Bradburn, 1969) scores ($r = .64$, $p < .001$) and Global Assessment Scale (Endicott, Spitzer, Fleiss, & Cohen,

1976) scores ($r = .29$, $p < .05$). The authors reported that the alpha coefficient for the scale was .84, indicating good internal consistency (Baker, Jodrey, & Intagliata, 1992).

Client Satisfaction Questionnaire

The 8-item version of the Client Satisfaction Questionnaire was developed "to provide an efficient, sensitive, and reasonably comprehensive" assessment of "consumer response to the care they receive" (Attkisson & Greenfield, 1994, p. 402). The psychometric adequacy was evaluated with a demographically and socioeconomically diverse population of mental health clients ($N = 3,628$) at 76 collaborating clinical facilities that included outpatient, partial day, inpatient, and residential services. Data on the basic validity and reliability of the measure have been reported. Internal reliability as measured by Cronbach's alpha is very good, with a range of coefficients across 12 studies equaling .83 to .93. High correlations ($r = .6$ to $.8$) with other satisfaction instruments provided evidence of construct validity (Attkisson & Greenfield, 1995).

Evidence of discriminant validity is provided by data indicating that demographic, socioeconomic, and service duration variables did not explain a significant proportion of variance in CSQ-8 ratings (Attkisson & Pascoe, 1983; Larsen, Attkisson, Hargreaves, & Nguyen, 1979; Nguyen, Attkisson, & Stegner, 1983). Roberts, Pascoe, and Attkisson (1983) provided additional support on the discriminant validity by indicating that CSQ-8 scores do not covary with measures of satisfaction with life and general health care.

Working Alliance Inventory

The Working Alliance Inventory (WAI-10) is a self-report instrument developed to measure the generic or non-specific variables affecting the degree of success in counseling and psychotherapy (Horvath & Greenberg, 1989). Psychometric properties of the WAI for use in the context of community support and rehabilitation services for persons with chronic mental illness have been evaluated in three studies.

In a study by Stylianos and Goering (1989), the WAI was administered to 22 practitioners and 50 clients with chronic psychotic disorders at a community-based rehabilitation agency. Adequate reliability was demonstrated with Cronbach's alpha coefficient of .93 indicating good internal consistency. Convergent validity was demonstrated by comparing results of the WAI with the Relationship Inventory (Barrett-Lennard, 1986) using the multitrait-multimethod matrix of Campbell and Fiske (1959) and analysis of variance methodology of Kavanagh, MacKinney, and Wolins (1971).

Two studies have demonstrated a positive relationship between WAI scores and outcomes of services for persons with chronic mental illness. Utilizing the WAI, Goal Attainment Scale (Kiresuk & Sherman, 1968), and Problem List (Battle, Imber, Hohen-Saric, Stone, Nash, & Frank, 1966) instruments with a sample of 22 rehabilitation therapist-client dyads, Gehrs and Goering (1994) found statistically significant positive correlations between therapist and client WAI and Goal Attainment Scale scores.

A 1995 study by Solomon, Draine, and Delaney assessed the relationship between WAI scores and multiple outcomes for a sample of 90 persons with chronic mental illness receiving case management services. Results of the study indicated that WAI scores significantly predicted scores on standardized measures of quality of life (Quality of Life Interview, Lehman, 1988), symptomatology (Brief Psychiatric Rating Scale, Overall & Gorham, 1962), medication compliance (Streicker, Amdur, & Dincin, 1986) and satisfaction with services (Hoult, Reynolds, & Charbonneau-Powis, 1983). This study also confirmed the internal consistency of the WAI, reporting alpha reliabilities ranging from .89 to .96.

Data Collection

Inpatient psychiatric treatment and crisis service utilization data was obtained from State psychiatric hospital and community mental health system records. Staff psychiatrists completed the Brief Psychiatric Rating Scale and the Global Assessment of Functioning Scale. Measures were administered within one month of admission to services, with follow-up administrations twelve months after admission.

Case managers administered the Quality of Life Interview (QOLI) and Satisfaction with Life Domains Scale (SWLD) at the time of consumer admission to the program. The evaluation researcher conducted follow-up administrations of the QOLI, SWLD, CSQ-8, WAI-12, and DAI-10.

Program Implementation Indicators and Measures

Although attention to research design may avoid "Type I" and "Type II" errors in program impact assessment, assessment of evaluability may prevent "Type III" errors discussed earlier in this chapter. Some empirical evidence is available indicating that fidelity of ACT Program implementation to established structural standards is linked to outcomes (McGrew et al., 1994). To enhance generalizability of study findings evaluability evaluation was conducted. The purpose of evaluability evaluation, a type of theory-driven evaluation, is to determine if the program meets preconditions for evaluation (Wholey, 1987).

Structural Fidelity

To establish program evaluability, the degree of conformance to structural standards for ACT Programs was assessed. For this purpose, the Index of Fidelity of Assertive Community Treatment (IFACT) was scored (McGrew et al., 1994; Teague et al., 1998; McHugo et al., 1999). This measure was developed in response to concerns about inadequate descriptions of interventions in published program evaluation studies (Brekke, 1988; Brekke & Test, 1992). Without specifying and accounting for the critical components of a service delivery model, "conclusions about presence or absence of effects are questionable" (Teague et al., 1998).

IFACT measure items were developed based on a survey of ACT experts who identified 14 critical ingredients from a listing of 73 suggested ingredients based on published program descriptions. The intraclass correlation for respondents' ratings of the

relative importance of the suggested ingredients ranged .98 across all items. Validity of the measure was established by ability of the IFACT total score to differentiate between programs based on rates of client retention in treatment and hospitalization rates (McGrew et al., 1994; McHugo et al., 1999).

Service Contact Frequency and Intensity

One of the objectives of this study was to assess linkages between service delivery frequency and intensity to intended outcomes. Published studies of these linkages have indicated mixed findings. Data on service contact frequency and intensity (face-to-face hours) will be obtained from review of client records. Monthly and weekly averages will be calculated on by dividing number of annual service contact and hours by number of days living in community (days in psychiatric hospital inpatient or residential crisis stabilization care are excluded from the calculation.)

Cost-Effectiveness Indicators and Measures

To assess comparative cost effectiveness of the two case management programs, annual public mental health system cost per person served was calculated. The following will comprise total per case cost: assertive community treatment and case management program costs (total program cost divided by caseload size), units of outpatient and rehabilitation services used times cost per unit, psychiatric hospital and residential crisis stabilization days used times per diem cost. Service utilization and cost data was obtained from billing and accounting records of the organization.

Cost-effectiveness of the ACT Program would be demonstrated by lower cost per case and by attainment of a statistically significant amount of improvement in indicators of intended outcomes that is equivalent to or greater than that attained by the SCM Program. Cost-effectiveness could also be demonstrated by equal cost per case and attainment of a greater degree of improvement in outcomes that is statistically significant.

Data Analysis Procedures

Outcome measures of the pre/post service status of the experimental group were compared utilizing the following statistical analyses. (1) Upon completion of the outreach effort and admission to program services, the baseline equivalency of the study groups on key demographic and clinical characteristics will be analyzed. Data on the following descriptive demographic and clinical statistics, including means and standard deviations, of study group clients will be presented: age, sex, race, education level, marital, vocational, legal, and residential status, diagnoses, treatment use history. Descriptive statistics on all dependent and intervening variables will also be presented. Chi-square and t-tests were used to determine the statistical significance of differences. (2) The statistical significance of differences in outcomes and costs were analyzed to determine the comparative cost-effectiveness of the ACT and SCM Programs. The statistical significance of the associations between dependent (outcome) variables and intervening (program implementation) variables were tested to assess linkages of program ingredients and outcomes. Multiple dependent and

intervening variables required utilization of a multivariate analysis of variance and multiple regression analysis. Criteria and procedures specified by Stevens (1992) for multivariate statistics will be followed.

Data Interpretation

After determining the statistical significance of differences in the study groups, and the statistical significance of associations between outcomes and program implementation variables the magnitude or practical and clinical significance of the differences and associations were assessed to strengthen the basis for evaluative conclusions. In addition to utilizing the procedures for calculating multivariate and univariate estimations of effect size specified by Stevens (1992), two of the following non-inferential methods recommended by Haase, Ellis, and Ladany (1989) were used: comparison with other research findings on efficacy, and evaluation of cost-effectiveness.

Study Limitations and Strengths

Although the internal validity of the study is strengthened by use of a randomized experimental design and statistical controls for Type I and Type II errors, there are notable limitations affecting the generalizability or external validity of findings. Tight controls on interventions and selection of participants required for randomized experimental designs potentially reduces generalizability (Rossi, Freeman, & Lipsey, 1999).

This limitation will be mitigated by use of standardized interventions that, in this study, will be monitored and verified by application of ACT program implementation fidelity criteria. These standardized criteria are transferable and enhance generalizability of findings.

Selection of participants was also based on published ACT program eligibility criteria. These criteria address the diagnostic and treatment history profile for persons who are most appropriate for ACT services based on likelihood of cost-effectiveness (McHugo et al., 1998).

Although randomized control trials (RCT) are generally regarded as the ideal design for eliminating threats to internal validity (Berk et al, 1985; Campbell & Stanley, 1963), potential threats remain in "real world" conditions. Dennis (1990) identifies six potential methodological problems that could threaten validity: (1) treatment dilution, (2) treatment contamination or confounding due to compensatory rivalry and "Hawthorne effect", (3) inaccurate caseflow and power estimates, (4) violations of the random assignment process, (5) changes in the environmental context, and (6) changes in the treatment regimens. Limited controls are available to the program evaluator for these threats. Assessment of the impact of these potential problems will be reviewed in the last chapter in conjunction with interpretation and discussion of study results.

CHAPTER IV

FINDINGS

This chapter sets forth the findings of this study in five sections. The first section presents descriptive data on the demographic and clinical characteristics of the study group population. Inferential data comparing study groups on results of outcome measurement over time is presented in the second. Program implementation data and analysis of the relationship between program ingredients and outcomes are presented in the third section. Cost-effectiveness data are addressed in the fourth section. Indications of the findings for support of the research hypotheses are summarized in the section five.

Section 1: Descriptive Data

Of 75 persons randomly assigned to each of the two levels of care, assertive community treatment (ACT) and standard case management (SCM), the first 25 persons engaged by each program constitute the study groups. Although outreach efforts continued for all persons in the target group, outcome measurement was limited to the first 50 persons engaged for purposes of establishing study timeframes. With 49 persons remaining engaged in services throughout the study, the attrition rate compared to similar studies was remarkably low. The one person lost to follow-up moved out of the agency service area during the study timeframe.

Demographic Characteristics

The study population produced by the outreach efforts was characterized by the following demographic distributions: 53% male and 47% female; 63% black and 37% white; average age of 41; 37% currently or previously married, 63% never married. The average number of years of education was 12. Only 10% were employed at time of program admission. Over 20% had experienced one or more episodes of being homeless during the previous 12 months. Analysis of recent history of legal problems indicated that over 18% had been a crime victim during the past 12 months, and over 34% having been arrested.

Clinical Characteristics

In terms of clinical characteristics, 69% had diagnosis of a schizophrenic or psychotic disorder; 31% had a bipolar or major affective disorder. Over half (55%) evidenced co-occurring substance use disorder and mental illness. Review of recent hospitalization rates indicated that the persons included in the study population averaged over 4 State psychiatric hospital admissions, and over 93 inpatient days per person, during the 12-month period preceding program admission. The average number of years clients had used State mental health care system services on an episodic basis, was over 12 at the time of outreach for re-engagement.

Table 2 compares the two study groups on these demographic and clinical characteristics. Although random assignment was expected to produce no statistically significant differences between the study groups on demographic and clinical

characteristics, differences were analyzed to assess whether the method of assignment for outreach and engagement to form study groups and low rate of attrition produced equivalent study groups.

Chi-square tests with Yates' correction for continuity and t-tests with Levene's test for equality of variances were used to determine whether any statistically significant differences based on these factors existed between the study groups. The probability level for these and all subsequent statistics reported in this study was set at .05. Equivalency of the study groups was confirmed for all selected criteria. There were no statistically significant differences based on demographic characteristics: gender, ethnicity, age, education, marital and residential status, history of crime perpetration or victimization, and employment status at time of selection for outreach and program engagement. Equivalency was also confirmed for the following clinical characteristics: diagnostic category, presence of co-occurring mental illness and substance abuse, prior year psychiatric hospitalization rate, and longevity of community mental health care system use.

Section 2: Outcomes Data

This section presents data comparing ACT and SCM outcomes for following program effectiveness indicators: relapse rates (inpatient psychiatric treatment and crisis service utilization rates); objective and subjective quality of life; symptom severity and level of functioning; medication compliance;

satisfaction with services; and strength of working relationship. Repeat measure multivariate analysis of covariance was used to

Table 2. Demographic and clinical characteristics of study samples.

	SCM (n=24) # (%) /Mean (SD)	ACT (n=25) # (%) /Mean (SD)	Analysis	df	p
Gender			$X^2 = 2.45$	1	.117
Male	10 (42%)	16 (64%)			
Female	14 (58%)	9 (36%)			
Ethnicity			$X^2 = 1.66$	1	.196
Black	13 (54%)	18 (72%)			
White	11 (46%)	7 (28%)			
Average age	42 (9.8)	40 (8.6)	$t = 1.05$	47	.298
Marital status			$X^2 = .49$	2	.782
Married/widowed	5 (20.5%)	4 (16%)			
Divorced/Separated	5 (20.5%)	4 (16%)			
Never Married	14 (58%)	17 (68%)			
Education level (average years)	12 (2.87)	12 (1.85)	$t = .06$	47	.952
Currently employed?			$X^2 = 1.70$	1	.193
Yes	4 (16%)	1 (4%)			
No	20 (84%)	24 (96%)			
Homeless episode during past year?			$X^2 = 1.53$	1	.216
Yes	3 (12.5%)	7 (28%)			
No	21 (87.5%)	18 (72%)			
Victim of crime past year?			$X^2 = .24$	1	.622
Yes	3 (13%)	4 (17%)			
No	21 (87%)	21 (83%)			
Arrested past year?			$X^2 = 1.08$	1	.622
Yes	6 (23.5%)	10 (35%)			
No	18 (67%)	15 (65%)			
Diagnostic category			$X^2 = .164$	1	.685
Schizophrenic/psychotic	16 (67%)	18 (72%)			
Bipolar/major affective	8 (33%)	7 (28%)			
Coexisting substance abuse?			$X^2 = .017$	1	.897
Yes	13 (54%)	14 (56%)			
No	11 (46%)	11 (44%)			
State psychiatric hospitalization					
Admissions previous year	3.6 (1.3)	4.9 (3.1)	$t = 1.87$	47	.071
Inpatient days previous year	74.7 (63.6)	103.9 (70.0)	$t = 1.53$	47	.133
Community mental healthcare use			$t = .65$	47	.516
Average number of years	11.9 (6.1)	13.0 (6.6)			

test the statistical significance of the mean scores on all outcome variables, by program by time, and by time alone.

Relapse Rates

Comparison of relapse rates provides data for testing the first research hypothesis and addresses the research question of whether a statistically significant difference in the relapse rate would be evidenced by persons provided ACT services compared with the relapse rate of SCM clients. The analysis of relapse rates is presented in three subsections: State psychiatric hospitalization, community-based crisis service utilization, and overall relapse rate.

State Psychiatric Hospitalization

With multivariate test of differences between the programs over time on State psychiatric hospitalization rate (number of admissions and number of inpatient days) was statistically significant (*Wilks'* $\Lambda = .877$, F -value = 2.804, $p = .027$), univariate test data were analyzed for rates of admission and inpatient days utilization. Time effect was also analyzed to indicate whether one or both programs demonstrated statistically significant change in hospitalization rates. The multivariate test for time effect was also statistically significant (*Wilks'* $\Lambda = .442$, F -value = 20.95; $p = .000$). Statistical power for the multivariate tests was adequate, .76 for program by time effect and 1.0 for time effect.

Medium to large effect sizes were indicated for differences in State psychiatric hospitalization rates explained program by time effects and for time effects alone ($\eta^2 = .06$ and .37 respectively). With multivariate tests of program by time effect, and time effect alone, indicating statistically significant

differences for changes in outcome variables as a set, univariate tests of differences in admission and inpatient day utilization rates are analyzed.

Table 3 presents data comparing the hospitalization rates of persons receiving ACT services with persons receiving SCM services. There was a statistically significant program by time effect on admission rates, but not for inpatient day utilization rates. Admission rates reduced during both the first and second year post-admission for both programs, with ACT evidencing a greater amount of reduction. The effect size for the amount of difference between programs was medium ($\eta^2 = .09$). The effect size for the amount of reduced admissions overall was large ($\eta^2 = .49$).

There was no statistically significant program by time effect for change in inpatient day utilization. Although both programs evidenced reduced inpatient day use rates during the first year post admission, there was an increase in the second year. Both programs evidenced increased use during the second year compared with the first year post-admission. Effect size for the amount of variance over time was large ($\eta^2 = .32$).

Community-Based Crisis Service Use Rates

The multivariate test was not statistically significant for differences in crisis service use rates during the first year post-admission (*Wilks' Λ* = .929, *F*-value = 1.15; *p* = .337). Differences between the programs over time based on community-based crisis service use (outpatient crisis intervention and

Table 3. Repeated measure analysis of variance results comparing State psychiatric hospitalization treatment rates (number of admissions and number of inpatient days) of the year prior with the first and second year post admission.

Program	1 Year Prior (T0): Mean (SD)	1 st Year Post (T1): Mean (SD)	Percent Change T0 - T1	2nd Year Post (T2): Mean (SD)	Percent Change: T1 - T2	Program by Time Effect: Wilks F-value	Time Effect: Wilks F-value
Inpatient Admissions							
SCM	3.6 (1.3)	2.1 (2.5)	- 42%	.85 (1.4)	-60%	4.03 1-β=.70	40.7 1-β=1.0
ACT	4.9 (3.3)	1.2 (1.2)	- 76%	.58 (1.0)	-52%	η ² =.09	η ² =.49
Inpatient Days							
SCM	75.7 (69.5)	33.0 (48.1)	- 58%	35.6 (82.9)	+ 17%	3.05	20.1 1-β=1.0
ACT	113.8 (77.0)	17.6 (25.6)	- 85%	24.0 (58.9)	+ 35%		η ² =.32

Bold = Statistical significance < .05

1 - β = Power; η² = Effect size (eta-squared)

short-term residential crisis stabilization admission and inpatient days) rates were also not statistically significant (*Wilks' Λ* = .931, *F*-value = 1.12; *p* = .353).

Time effect was also analyzed to indicate whether one or both programs demonstrated statistically significant change in crisis service use rates. The multivariate test for time effect was statistically significant (*Wilks' Λ* = .730, *F*-value = 5.53; *p* = .003). Statistical power for the multivariate tests was adequate for time effect (1 - β = .92). The effect sizes for the difference in crisis service use explained by time effect was large (η² = .27). With the multivariate test indicating statistically significant time effect for differences in crisis service use, univariate tests of differences in outpatient crisis intervention, residential crisis stabilization admission and inpatient days use rates are analyzed.

Table 4 presents data comparing community-based crisis service rates. As noted, there was a statistically significant time effect on change in crisis service use rates. Outpatient crisis intervention service use indicated a significant increase during the second year post-admission (F -value = 9.08, p = .004). Statistical power for this test was adequate ($1 - \beta$ = .84), with large effect size for the difference (η^2 = .16). Crisis residential crisis stabilization use rates decreased, average number of days used increased, but changes were not statistically significant. Outpatient crisis intervention use increased for both programs during the second year compared with the first year post-admission.

Overall Relapse Rate

The overall relapse rate aggregates data on hospitalization and residential crisis stabilization admissions and days used. The multivariate test was not statistically significant for program differences in overall relapse rates during the first year post-admission ($Wilks'\Lambda$ = .973, F -value = .641; p = .532). Differences between the programs over time based on community-based crisis service use (outpatient crisis intervention and short-term residential crisis stabilization admission and inpatient days) rates were also not statistically significant ($Wilks'\Lambda$ = .990, F -value = .232; p = .794).

The multivariate test for time effect on overall relapse rate was, however, statistically significant ($Wilks'\Lambda$ = .736, F -value = 8.24; p = .001). Statistical power for the multivariate

Table 4. Repeated measure analysis results comparing community-based crisis service utilization rates (outpatient crisis intervention and short-term residential crisis stabilization) during first and second year post admission.					
Program	1 st Year Post (T1): Mean (SD)	2nd Year Post (T2): Mean (SD)	Percent Change: T1 - T2	Program by Time Effect: Wilks <i>F</i> - value	Time Effect: Wilks <i>F</i> - value
Outpatient Crisis Intervention Use					
SCM	2.3 (3.7)	4.6 (7.7)	+ 100%	.343	9.08
ACT	4.0 (5.4)	7.9 (8.6)	+ 98%		1 - β = .84 η^2 = .16
Short-Term Residential Crisis Stabilization Admissions					
SCM	.71 (1.0)	.38 (.50)	- 46%	.029	3.54
ACT	1.1 (1.7)	.68 (.48)	- 38%		
Short-Term Residential Crisis Stabilization Days					
SCM	5.0 (7.8)	8.3 (15.5)	+ 66%	.029	1.23
ACT	7.3 (9.3)	8.1 (8.9)	+ 11%		

Bold = Statistical significance < .05

1 - β = Power; η^2 = Effect size (eta-squared)

tests was adequate for time effect (1 - β = .95). The effect sizes for the difference in overall relapse explained by time effect was large (η^2 = .26). Table 5 presents data on changes in relapse rates based on program by time effect, and by time effect alone. Univariate tests indicated a statistically significant reduction in the number of admissions (F-value = 11.44, p = .001), with effect size large (η^2 = .20), and statistical power adequate (1 - β = .91). There was an increase in number of average number of days used, but the amount was not statistically significant.

Clinical Status and Quality of Life

Comparison of clinical status, quality of life, and service

Table 5. Repeated measure analysis results comparing overall relapse rates during first and second year post admission. Relapse rate equals total inpatient treatment and residential crisis stabilization admissions and days					
Program	1 st Year Post (T1): Mean (SD)	2nd Year Post (T2): Mean (SD)	Percent Change: T1 - T2	Program By Time Effect: Wilks F- value	Time Effect: Wilks F- value
Inpatient Treatment/Residential Crisis Stabilization Admissions					
SCM	2.63 (2.8)	1.21 (1.4)	- 54%	.340	11.44
ACT	2.24 (2.2)	1.24 (.97)	- 45%		1- β = .91 η^2 = .20
Inpatient Treatment/Residential Crisis Stabilization Days					
SCM	36.4 (46.9)	45.0 (82.2)	+ 24%	.029	.443
ACT	24.4 (27.3)	31.1 (59.2)	+ 27%		

Bold = Statistical significance < .05

1 - β = Power; η^2 = Effect size (eta-squared)

satisfaction outcome indicators provides data for testing of four of the research hypotheses (2 - 5). These hypotheses address questions regarding whether there are statistically significant different changes over time in the clinical status (psychiatric symptom severity, level of functioning, and medication compliance), quality of life, and service satisfaction for ACT clients compared with SCM clients.

The multivariate test of differences between ACT and SCM groups over time on the clinical and quality of life outcome variables considered as a set was statistically significant (*Wilks' Λ* = .375, *F*-value = 2.78, *p* = .006), univariate test data are presented for each outcome indicator. Time effect was also analyzed to indicate whether one or both programs demonstrated changes in outcome indicators. The multivariate test for time

effect was also statistically significant (*Wilks' Λ* = .102, *F*-value = 14.63, *p* = .000).

Statistical power for the multivariate tests was adequate, .93 for program by time effect and 1.0 for time effect. Effect sizes (eta-squared) were large at .60 and .90 respectively. With multivariate tests of program by time effect, and time effect indicating statistically significant differences for changes in outcome variables as a set, univariate tests of differences for specific variables are analyzed.

Clinical Status

Table 6 presents data gathered from the administration of the Brief Psychiatric Rating Scale (BPRS), Global Assessment of Functioning Scale (GAF), and Drug Attitude Inventory (DAI-10) at admission and follow-up. Changes in BPRS subscale scores for positive and negative symptoms were also analyzed. There was no statistically significant program by time effect or time alone effect for changes in mean BPRS total scores, nor for positive and negative subscale scores.

There was a statistically significant program by time effect for change in mean GAF scores, with average level of functioning improving for ACT clients, declining for SCM clients. The effect size for this difference was medium ($\eta^2 = .10$). This finding lends support to other research findings that self-reported level of functioning as addressed on the QOLI also improved for ACT clients, but not for SCM clients. At follow-up measurement, there was a statistically significant association between GAF scores and QOLI functional assessment scale scores ($r = .42$, $p = .003$).

Although medication compliance, as indicated by the Drug Attitude Inventory (DAI-10) improved, the amount of improvement was not statistically significant. Convergent validity of the DAI-10 scores is supported by positive correlation with the independent rating of medication compliance levels by the case managers at time of follow-up assessment($r = .335$, $p = .037$).

Table 6. Repeated measures multivariate analysis of clinical outcomes at 18-month follow-up as measured by change in Global Assessment of Functioning Scale, Brief Psychiatric Rating Scale (BPRS), and Drug Attitude Inventory (DAI-10) scores.						
Clinical Outcome Variables	Program	Time 1 Mean (SD)	Time 2 Mean (SD)	Percent Change by Program	Program by Time Effect: F-value	Time Effect: F-value
GAF: Global Assessment of Functioning Score	SCM	52.1 (15.9)	48.2 (14.8)	- 7.5%	5.07 $1-\beta = .59$ $\eta^2 = .10$.050
	ACT	49.8 (11.8)	53.0 (8.7)	+ 6.4%		
BPRS: Brief Psychiatric Rating Scale Total Score	SCM	51.5 (22.6)	47.0 (17.4)	+ 8.7%	2.77	.055
	ACT	40.2 (10.8)	43.6 (8.0)	- 8.5%		
BPRS: Negative Symptoms Subscale Score	SCM	10.4 (3.6)	9.4 (4.6)	+ 10.6%	1.90	.037
	ACT	6.5 (2.5)	7.3 (4.0)	+ 12.3%		
BPRS: Positive Symptoms Subscale Score	SCM	12.8 (5.4)	11.5 (6.6)	+ 10.2%	.954	.397
	ACT	11.7 (6.0)	12.0 (4.0)	- 2.6%		
DAI-10: Drug Attitude Inventory Score	SCM	.82 (2.1)	1.6 (3.4)	+ 95.1%	.002	2.31
	ACT	.56 (2.9)	1.3 (3.1)	+ 132.1%		

Time 1 = Admission Measure, Time 2 = Follow-Up Measure (18 months)

Plus (+) = improvement; Minus (-) = no improvement

Bold = statistically significant ($p < .05$)

$1 - \beta$ = Power; η^2 = Effect size (eta-squared)

Subjective Quality of Life and Satisfaction with Services

Table 7 presents analysis of subjective quality of life

as measured by the Satisfaction with Life Domains Scale (SWLD) data gathered at time of program admission and at 18-months follow-up to measure change in subjective quality of life. Data analyzing satisfaction with services as measured by the Consumer Satisfaction Questionnaire (CSQ-8) is also presented. There was no statistically significant difference in program by time effect and by time effect alone on change in the mean SWLD score. Analyses of SWLD Scale reliability indicated satisfactory internal consistency for both administrations (coefficient alpha $>.92$). The convergent validity of quality of life measures was supported by the positive correlations of SWLD and QOLI composite scores at admission and at follow-up administration ($r = .42, .57, p < .01$).

There was no statistically significant difference in program by time effect and by time effect alone on change in mean CSQ-8 score, however, a statistically significant difference in WAI-12 scores. The working relationship between SCM clients and case managers was stronger than that reported by ACT clients. The mean WAI score was 71 ± 8.5 for SCM clients, 62 ± 13.1 for ACT. Effect size for this difference was medium to large ($\eta^2 = .09$).

Objective Quality of Life Indicators

Table 8 presents analyses of data gathered by administration of the Quality of Life Interview (QOLI) Objective Scales at time of program admission and at 18-months follow-up. In addition to assessment of changes in the 10 objective quality of life indicators assessed by the QOLI, a composite or overall score was calculated and evaluated. QOLI composite scores were positively

Tables 7. Repeated measures multivariate analysis of subjective quality of life at 18-month follow-up, measured by the Satisfaction With Life Domains Scale (SWLD) and satisfaction with services as measured by the Consumer Satisfaction Questionnaire (CSQ-8).						
Outcome Variables:	Program	Time 1 Mean (SD)	Time 2 Mean (SD)	Percent Change by Program	Program by Time Effect: F-value	Time Effect: F-value
Satisfaction with Life Domains Scale (SWLD)	SCM	74.3 (15.0)	78.3 (15.4)	+ 5.4%	.092	2.30
	ACT	70.7 (22.1)	73.3 (19.5)	+ 3.7%		
Consumer Satisfaction Questionnaire (CSQ-8)	SCM	25.4 (3.7)	26.0 (4.8)	+2.4%	.366	.021
	ACT	25.6 (5.1)	25.3 (5.4)	-1.2%		

Time 1 = Admission Measure, Time 2 = Follow-up Measure (18 months)

Plus (+) = improvement; Minus (-) = no improvement

Bold = statistically significant ($p < .05$)

correlated with Satisfaction with life Domain (SWLD) scores at admission and follow-up administrations.

There was a statistically significant difference in program by time effect on change in mean scores for three of ten quality of life indicators including level of functioning, residential stability, and level of social interaction. Self-rated level of functioning improved for ACT clients; declined for SCM clients. Residential stability improved for SCM clients; declined for ACT clients. Social interaction levels improved for both SCM and ACT clients, with greater level of improvement evidenced by the former. Based on criteria provided by Cohen (1988) and Lipsey (1990) criteria, effect sizes were large ($\eta^2 > .14$), and statistical power was adequate ($> .80$) for these three univariate tests. There was no statistically significant difference for program by time effect on change in average composite scores.

There was a statistically significant difference in time effect on change in mean scores for four of ten quality of life

indicators including level of participation in activities of daily living, residential stability, and social relations, and for composite scores. Effect sizes were large ($\eta^2 > .14$) for the univariate effect of time on three of the indicators, medium to large range ($\eta^2 = .12$) for level of social interaction.

Section 3: Program Implementation Analysis

This section presents data on program implementation fidelity as measured by the Index of Fidelity of Assertive Community Treatment (IFACT). Data are also presented on analysis of differences between four selected program implementation attributes (ingredients and components) including measures of service delivery frequency and intensity, strength of the client-case manager working relationship, and level of medication compliance attained. The relationship between these program implementation attributes and program outcome goals are also analyzed. The last three research hypotheses (6 - 8) are addressed by these analyses. These hypotheses proposed a statistically significant differentiation between the ACT and SCM programs based on these attributes. It was further hypothesized that a positive association would exist between these program attributes and outcome results.

Implementation Data

The level of ACT program implementation fidelity as measured by administration of the Index of Fidelity of Assertive Community Treatment (IFACT) was .96 (1.0 = full conformance with implementation standards). In contrast, the SCM program

Table 8. Repeated measures multivariate analysis of objective and subjective quality of life outcome indicators at 18-month follow-up, measured by the Quality of Life Interview (QOLI) objective scales and the Satisfaction With Life Domains Scale (SWLD).						
Outcome Variables	Program	Time 1 Mean (SD)	Time 2 Mean (SD)	Percent Change by Program	Program by Time Effect: F-value	Time Effect: F-value
Activities of Daily Living: Participation level	SCM	38.4 (10.5)	43.8 (13.7)	+ 14.1%	2.60	15.25 1- β = .97 η^2 = .24
	ACT	41.1 (14.4)	54.0 (13.4)	+ 31.4%		
Legal/Safety Issues: Arrest rate	SCM	33.3 (41.7)	15.0 (33.3)	- 55.0%	.926	.025
	ACT	34.8 (46.6)	35.0 (43.5)	+ 0.6%		
Family Relations: Amount of interaction	SCM	57.7 (13.8)	63.2 (22.6)	+ 9.5%	.37	6.43 1- β = .70 η^2 = .12
	ACT	52.8 (25.4)	65.3 (22.9)	+ 12.5%		
Level of Functioning: Self-rated	SCM	56.3 (7.1)	46.7 (24.0)	- 17.1%	18.39 1- β = .99 η^2 = .28	2.87
	ACT	26.0 (15.3)	48.0 (25.0)	+ 84.6%		
Health Status: Extent of problems	SCM	74.9 (18.2)	71.0 (17.8)	- 5.2%	.420	.176
	ACT	66.8 (24.7)	67.6 (17.3)	+ 1.2%		
Living Situation: Incidence of homelessness	SCM	12.5 (33.8)	12.5 (33.8)	N/A	1.19	.045
	ACT	28.0 (45.8)	20.0 (40.8)	-28.6%		
Living Situation: Residential stability	SCM	62.3 (37.2)	78.3 (35.2)	+ 25.7%	11.87 1- β = .92 η^2 = .20	.014
	ACT	91.0 (9.3)	76.0 (31.2)	- 16.5%		
Social Relations: Amount of interaction	SCM	32.9 (7.5)	46.0 (12.3)	+ 39.8%	9.87 1- β = .87 η^2 = .17	13.29 1- β = .96 η^2 = .22
	ACT	33.1 (10.7)	33.9 (13.2)	+ 2.4%		
Legal & Safety Issues: Victimization	SCM	13.0 (33.7)	10.0 (28.0)	+ 23.1%	3.08	4.52
	ACT	24.0 (43.6)	30.0 (41.8)	- 25.0%		
Work & School: Employment Status	SCM	15.8 (33.1)	10.0 (28.0)	- 36.7%	.850	.041
	ACT	4.2 (20.0)	10.0 (27.4)	+ 138.1%		
QOLI: Composite Score	SCM	63.1 (10.9)	61.3 (9.9)	+ 0.3%	.001	77.84 1- β = 1 η^2 = .62
	ACT	55.2 (9.3)	56.6 (12.2)	+ 2.5%		

Time 1 = Admission Measure, Time 2 = Follow-up Measure (18 months)

Plus (+) = improvement; Minus (-) = no improvement

Bold = statistically significant ($p < .05$);

1 - β = Power; η^2 = Effect size (eta-squared)

implementation .24. Comparison scores provided by the IFACT developers indicated an average score of .35 for low fidelity programs (McGrew et al, 1994).

As hypothesized, service contact frequency and intensity (IFACT subscale items) were higher for ACT than for SCM clients. The average contact frequency per month was 21.0 ± 10.5 for ACT clients, 7.5 ± 4.1 for SCM clients. The average number of service hours received by ACT clients was 10.9 ± 5.0 , 6.0 ± 4.2 for SCM clients. T-tests results for these differences were statistically significant.

As reported previously, there was a statistically significant difference between programs based on the strength of the working relationship between client and case manager. SCM clients indicated average WAI-12 scores of 71 ± 8.5 compared to 62 ± 13.1 indicated by ACT clients. There was no statistically significant difference between programs for levels of medication compliance attained as assessed by case manager ratings as well as by DAI-10 scores. There was a statistically significant correlation ($r = .35$, $p = .039$) of these independently scored measures.

In accordance with the theory-driven evaluation design, these program implementation attributes were operationalized as intervening variables presumed to explain or predict the relationship between program components and intended outcomes. Stepwise regression analyses are used to assess which, if any, outcomes are predicted by these four case management program

attributes compared with type of program structure (ACT or SCM) used as a design or dummy variable.

This analysis is preceded by review results of the assessment of potential influence of multicollinearity on the regression analyses. The presence of statistically significant intercorrelations (multicollinearity) among selected intervening variables (outcome predictors) potentially confounds determination of which, if any, program attributes are the most important predictors of which outcomes. As recommended by Stevens (1996), the variance inflation factor value (VIF) for each predictor in relation to other predictors for each outcome indicator was examined. None of the VIF values exceeded 10. "It is generally believed that if any VIF exceeds 10, there is reason for at least some concern..." (Myers, 1990).

Regression Model

"The order in which the predictors enter a regression equation can make a great deal of difference with respect to how much variance on" outcomes "are accounted for" (Stevens, 1996). Rather than rely on the mixed findings of previous research, the order of entry is determined mathematically via use of the stepwise regression procedure. Results for these analyses for each of the 19 outcome indicators are presented in Tables 9 - 31. These results are presented in four subsections following the previous presentation on outcomes: (1) relapse rates, (2) clinical status, (3) satisfaction with life and services, and (4) objective quality of life.

Relapse Rates

Tables 9 - 12 present data comparing the predictive relationship between the selected program ingredients and relapse rates. Strength of the working relationship as measured by the Working Alliance Inventory (WAI) was the only significant predictor of relapse rate across all three indicators. Higher WAI scores were associated with lower relapse rates. The range of effect sizes was medium to large for amount of variance in relapse rates explained by the strength of the working relationship ($R^2 = .06 - .17$).

Clinical Status

Tables 13 - 15 present data comparing the predictive relationship between the selected program ingredients and indicators of psychiatric symptom severity. Frequency (FRQ) and intensity (INT) of services (FRQ) was a significant predictor of symptom severity status for two indicators: BPRS total score and positive symptoms subscale score. Higher frequency and intensity of services provided were associated with lower symptom severity. Effect sizes were large for amount of variance in these two

Table 9. Regression analysis of program ingredients predicting outpatient and mobile crisis service use rate at 12-month follow-up.

Variable	B	SE B	Beta	T	P
PRG	-.964831	1.803426	-.104858	-.535	.5954
DAI	.080540	.203186	.055779	.396	.6938
FRQ	.069628	.094465	.267520	.737	.4651
INT	-.010413	.165186	-.019772	-.063	.9500
WAI	-.178964	.055212	-.427441	-3.241	.0022
Adjusted R Square = .165 Bold = statistically significant					

Abbreviations used in Tables 9 - 31: PRG = Program (design variable for program structure), DAI = Drug Attitude Inventory scores
FRQ = Service frequency (average monthly service contacts provided)
INT = Service intensity (average monthly service hours provided)
WAI = Working Alliance Inventory scores

Table 10. Regression analysis of program ingredients predicting outpatient and mobile crisis service use rate at 24-month follow-up

Variable	B	SE B	Beta	T	P
PRG	.214564	3.069031	.013172	.070	.9446
DAI	.072184	.380349	.028238	.190	.8504
FRQ	.045694	.117921	.109560	.387	.7003
INT	.029387	.190940	.037768	.154	.8784
WAI	-.257449	.101390	-.347324	-2.539	.0145
Adjusted R Square = .102 Bold = statistically significant					

Table 11. Regression analysis of program ingredients predicting inpatient psychiatric hospital treatment or residential crisis stabilization admissions at 12-month follow-up.

Variable	B	SE B	Beta	T	P
PRG	-1.592037	1.011658	-.323806	-1.574	.1229
DAI	-.048031	.113980	-.062254	-.421	.6756
FRQ	.032937	.090346	.138909	.365	.7172
INT	.046071	.157984	.096021	.292	.7720
WAI	-.063414	.031295	-.283449	-2.026	.0484
Adjusted R Square = .061 Bold = statistically significant					

Table 12. Regression analysis of program ingredients predicting inpatient psychiatric hospital treatment or residential crisis stabilization admissions at 24-month follow-up.

Variable	B	SE B	Beta	T	P
PRG	.252176	3.156360	.014881	.080	.9367
DAI	.072178	.391172	.027142	.185	.8545
FRQ	.025634	.121276	.059080	.211	.8336
INT	.117978	.196373	.145750	.601	.5511
WAI	-.270193	.105349	-.350391	-2.565	.0136
Adjusted R Square = .104 Bold = statistically significant					

symptom severity indicators explained by frequency and intensity of services ($R^2 = .18 - .21$). For negative symptom severity score, service intensity of was the only significant predictor. As with the other symptom severity indicators, higher service intensity was associated with lower symptom severity.

Table 16 presents data comparing the predictive relationship between the selected program ingredients and functional status. Service intensity (INT) was the only significant predictor of the Global Assessment of Functioning (GAF) score. Higher intensity of

Table 13. Regression analysis of program ingredients predicting symptom severity at 12-month follow-up measured by the Brief Psychiatric Rating Scale (BPRS).

Variable	B	SE B	Beta	T	P
PRG	-3.416655	-4.989931	-.128823	-.685	.4973
DAI	-.415675	.535792	-.099874	-.776	.4422
FRQ	-.609817	.255605	-.812854	-2.386	.0216
INT	-1.381888	.456945	-.910274	-3.024	.0042
WAI	-.021228	.168013	-.017590	-.126	.9001
Adjusted R Square = .209 Bold = statistically significant					

Table 14. Regression analysis of program ingredients predicting severity of negative symptoms at 12-month follow-up measured by the BPRS negative symptoms subscale.

Variable	B	SE B	Beta	T	P
PRG	-.038008	-.037079	-.768929	-.252	.8024
DAI	-.179151	-.199197	-.998886	-1.379	.1747
FRQ	-.228161	-.113804	-.201013	.777	.4412
INT	-.372322	-.111395	-.438226	3.342	.0016
WAI	-.038876	-.043249	-.999952	-.294	.7704
Adjusted R Square = .175 Bold = statistically significant					

Table 15. Regression analysis of program ingredients predicting severity of positive symptoms at 12-month follow-up measured by the BPRS positive symptom subscale.

Variable	B	SE B	Beta	T	P
PRG	-3.079884	-2.002165	-.288547	-1.538	.1313
DAI	-.226546	-.225578	-.135253	-1.004	.3209
FRQ	-.621836	-.178803	1.208022	-3.478	.0012
INT	-1.127230	-.312665	-1.082175	-3.605	.0008
WAI	-.092196	-.069657	-.189824	-1.324	.1926
Adjusted R Square = .207 Bold = statistically significant					

Table 16. Regression analysis of program ingredients predicting level of functioning at 12-month follow-up measured by the Global Assessment of Functioning Scale (GAF).

Variable	B	SE B	Beta	T	P
PRG	7.554948	4.907693	.312132	1.539	.1310
DAI	-.156779	.552935	-.041276	-.284	.7781
FRQ	.875103	.438280	.749694	1.997	.0522
INT	.696498	.329221	.294870	2.116	.0397
WAI	.061861	.170744	.056167	.362	.7189
Adjusted R Square = .068 Bold = statistically significant					

services provided was associated with higher functional status. The effect size was medium for amount of variance in functional

status explained by intensity of services ($R^2 = .07$). The validity of the clinical status measures was supported by a statistically significant correlation of the independently administered BPRS and GAF scales ($r = -.56$, $p = .000$), indicating, as expected, association of lower symptom severity with higher level of functioning.

Table 17 presents data comparing the predictive relationship between the selected program ingredients and medication compliance as measured by the Drug Attitude Inventory (DAI). Strength of the working relationship as measured by the Working Alliance Inventory (WAI) was the only significant predictor of medication compliance. Higher WAI scores were associated with DAI scores. The effect size was medium for amount of variance in medication compliance explained by the strength of the working relationship ($R^2 = .07$).

Table 17. Regression analysis of program ingredients predicting medication compliance at 12-month follow-up measured by the Drug Attitude Inventory (DAI-10)

Variable	B	SE B	Beta	T	P
PRG	.339890	1.337084	.053337	.254	.8005
FRQ	-.016608	.119469	-.054042	-.139	.8901
INT	.033535	.208896	.053925	.161	.8732
WAI	.085533	.040414	.294974	2.116	.0396
Adjusted R Square = .068		Bold = statistically significant			

Table 18 presents data comparing the predictive relationship between the selected program ingredients and strength of the client-case manager working relationship as measured by the Working Alliance Inventory (WAI). Program structure and medication compliance were significant predictors of medication compliance. Stronger working relationship was associated with SCM

services and higher medication compliance levels. The effect size was large for amount of variance in strength of the working relationship explained by program structure and medication compliance level ($R^2 = .13$).

Table 18. Regression analysis of program ingredients predicting strength of the client-case manager working relationship as measured by the Working Alliance Inventory (WAI-12) at 18-month follow-up.

Variable	B	SE B	Beta	T	P
PRG	-6.269395	-2.958575	-.285278	-2.119	.0395
DAI	.970262	.464274	.281345	2.090	.0422
FRQ	.204065	.385748	.192544	.529	.5995
INT	.064961	.676613	.030290	.096	.9239
Adjusted R Square = .132		Bold = statistically significant			

Subjective Quality of Life

Tables 19 presents data comparing the predictive relationship between the selected program ingredients and subjective quality of life as measured by the Satisfaction with Life Domains Scale (SWLD). Strength of the working relationship as measured by the Working Alliance Inventory (WAI) was the only significant predictor of subjective quality of life. Higher WAI scores were associated with higher SWLD scores. The effect size was large for amount of variance in subjective quality of life explained by strength of the working relationship ($R^2 = .34$).

Table 19. Regression analysis of program ingredients predicting subjective quality of life (percent of optimal) at 12-month follow-up measured by the Satisfaction with Life Domains Scale (SWLD).

Variable	B	SE B	Beta	T	P
PRG	-.964978	4.940243	-.027688	-.195	.8461
DAI	.039839	.565417	.007284	.070	.9442
FRQ	-.023531	.263567	-.023869	-.089	.9293
INT	.302046	.458428	.151409	.659	.5136
WAI	.941355	.186162	.593587	5.057	.0000
Adjusted R Square = .339		Bold = statistically significant			

Satisfaction with Services

Table 20 presents data comparing the predictive relationship between the selected program ingredients and satisfaction with services as measured by the Consumer Satisfaction Questionnaire (CSQ-8). As was the case with subjective quality of life, strength of the working relationship was the only significant predictor of satisfaction with services. Higher WAI scores were associated with higher CSQ scores. The effect size was large for amount of variance in satisfaction with services explained by the strength of the working relationship ($R^2 = .34$).

Table 20. Regression analysis of program ingredients predicting satisfaction with services at 12-month follow-up measured by the Client Satisfaction Questionnaire (CSQ-8).

Variable	B	SE B	Beta	T	P
PRG	1.906946	1.681039	.190187	1.134	.2629
DAI	.171773	.189397	.109170	.907	.3695
FRQ	-.098665	.150125	-.204043	-.657	.5145
INT	.136275	.262517	.139271	.519	.6063
WAI	.294697	.058485	.645914	5.039	.0000
Adjusted R Square = .388		Bold = statistically significant			

Objective Quality of Life Outcomes

Tables 21 - 31 present results of the regression analysis of program ingredients predicting objective quality of life outcomes as measured by Quality of Life Interview (QOLI) objective scales. This section of results is presented in separate subsections, one for each of the selected program ingredients or components.

Program Structure

Program structure (PRG) was the sole significant predictor of levels of homelessness and social interaction as measured by the QOLI (see Table 21 - 22). ACT clients evidenced a higher rate

of homelessness than SCM clients did. SCM clients evidenced higher levels of social interaction than ACT clients did. The effect size was small for amount of variance in homelessness and large for social interaction levels explained by whether the person was receiving ACT or SCM program services ($R^2 = .06, .17$).

Table 21. Regression analysis of program ingredients predicting residential status (homelessness) at 12-month follow-up measured by the QOLI Living Situation Scale.

Variable	B	SE B	Beta	T	P
PRG	.619875	.300081	.288500	2.066	.0444
DAI	-.056004	-.058424	.997718	-.397	.6933
FRQ	-.206020	-.163477	.577234	-1.124	.2669
INT	-.200985	-.184068	.768929	-1.270	.2104
WAI	-.076520	-.076269	.910767	-.519	.6064
Adjusted R Square = .064					Bold = statistically significant

Receipt of ACT services, in combination with high medication compliance scores, also predicted level of participation in activities of daily living (ADLS) as measured by the QOLI Daily Living Activities and Functioning Scale (see Table 23). The effect size was large ($R^2 = .23$) for amount of variance in ADLS explained by whether client was receiving ACT or SCM services, and evidenced a high DAI score.

Medication Compliance

Drug Attitude Inventory (DAI) score was also a significant predictor of self-rated level of functioning as measured by the QOLI Daily Activities and Functioning Scale (see Table 24). Higher DAI score was associated with higher self-rating of functioning. The effect size was medium for amount of variance in self-rated functioning explained by DAI score ($R^2 = .08$).

Table 22. Regression analysis of program ingredients predicting level of social interaction at 12-month follow-up measured by the QOLI Social Relations Scale.

Variable	B	SE B	Beta	T	P
PRG	-12.085897	3.655340	-.434402	-3.306	.0018
DAI	.523910	.613702	.119999	.854	.3981
FRQ	.431747	.489893	.321781	.881	.3832
INT	-.701937	.849088	-.258532	-.827	.4131
WAI	-.187188	.201406	-.147859	-.929	.3580
Adjusted R Square = .171 Bold = statistically significant					

Table 23. Regression analysis of program ingredients predicting level of participation in activities of daily living (ADLS) at 12-month follow-up measured by the QOLI Daily Activities & Functioning Scale.

Variable	B	SE B	Beta	T	P
PRG	10.744003	3.599941	.378320	2.984	.0045
DAI	1.622639	.564920	.364102	2.872	.0061
FRQ	.338016	.479778	.246801	.705	.4849
INT	-.383951	.838969	-.138539	-.458	.6495
WAI	.081423	.186911	.063008	.436	.6653
Adjusted R Square = .230 Bold = statistically significant					

Table 24. Regression analysis of program ingredients predicting self-rated level of functioning at 12-month follow-up measured by the QOLI Daily Activities & Functioning Scale.

Variable	B	SE B	Beta	T	P
PRG	6.646269	10.091886	.138279	.659	.5137
DAI	2.316667	1.047004	.307149	2.213	.0318
FRQ	-.681206	.901253	-.293882	-.756	.4539
INT	1.084051	1.575985	.231116	.688	.4952
WAI	.128095	.351107	.058569	.365	.7170
Adjusted R Square = .075 Bold = statistically significant					

Service Frequency and Intensity

Service contact frequency was the sole significant predictor of residential stability as measured by the QOLI Living Situation Scale (see Table 25). Higher frequency of service contacts was associated with higher level of residential stability. The effect size was small, however, for the amount of variance in residential stability explained by service contact frequency (R^2

= .05). Intensity of services was not a significant predictor of any objective quality of life indicators.

Table 25. Regression analysis of program ingredients predicting residential stability at 12-month follow-up measured by the QOLI Living Situation Scale.

Variable	B	SE B	Beta	T	P
PRG	-17.064112	13.376379	-.261910	-1.276	.2089
DAI	-.113008	1.507075	-.011053	-.075	.9406
FRQ	2.639437	1.194573	.840035	2.210	.0325
INT	-3.490666	2.088903	-.549010	-1.671	.1020
WAI	.561897	.465378	.189532	1.207	.2339
Adjusted R Square = .050		Bold = statistically significant			

Working Relationship

Strength of the client-case manager working relationship measured by the Working Alliance Inventory (WAI) was the sole significant predictor of three QOLI indicators: victimization rate as measured by the Legal and Safety Issues Scale, level of family involvement as measured by the Family Relations Scale, and overall objective quality of life as measured by the QOLI composite score (see Tables 26 - 28). Higher WAI scores were associated with higher levels of family involvement, lower levels of victimization, and higher QOLI composite scores. Effect sizes were large for amount of variance in these indicators explained by strength of the working relationship ($R^2 = .12, .32, \& .21$ respectively). Higher WAI score was also positively associated with lower arrest rate (see Table 29). The effect size was medium-large ($R^2 = .11$) for amount of variance in arrest rate explained by these factors. None of the program ingredients was significant predictors of two quality of life indicators: health and employment status (see Tables 30 - 31).

Table 26. Regression analysis of program ingredients predicting family involvement at 12-month follow-up measured by QOLI Family Relations Scale.

Variable	B	SE B	Beta	T	P
PRG	.172415	.177009	.910767	1.220	.2288
DAI	.003992	.004103	.912990	.028	.9779
FRQ	.131405	.141157	.997115	.967	.3386
INT	-.038607	-.041530	.999952	-.282	.7793
WAI	.748068	.275156	.368635	2.719	.0092
Adjusted R Square = .118 Bold = statistically significant					

Table 27. Regression analysis of program ingredients predicting victimization rate at 12-month follow-up measured by QOLI Legal & Safety Issues Scale.

Variable	B	SE B	Beta	T	P
PRG	27.500000	9.820192	.378143	2.800	.5319
DAI	1.332380	1.599612	.116751	.833	.4095
FRQ	-.496629	1.267922	-.141603	-.392	.6972
INT	.129458	2.217165	.018241	.058	.9537
WAI	-.952249	.493953	-.287761	-1.928	.0492
Adjusted R Square = .317 Bold = statistically significant					

Table 28. Regression analysis of program ingredients predicting overall objective quality of life score (percent of optimal) at 12-month follow-up measured by a composite score of QOLI Objective Scales.

Variable	B	SE B	Beta	T	P
PRG	-5.128948	4.366118	-.220462	-1.175	.2466
DAI	.133728	.491917	.036630	.272	.7870
FRQ	.650476	.389915	.579768	1.668	.1025
INT	-1.212820	.681828	-.534201	-1.779	.0823
WAI	.503295	.135847	.475429	3.705	.0006
Adjusted R Square = .210 Bold = statistically significant					

Table 29. Regression analysis of program ingredients predicting arrest rate at 12-month follow-up measured by the QOLI Legal & Safety Issues Scale.

Variable	B	SE B	Beta	T	P
PRG	.234910	.239984	.910767	1.677	.1004
DAI	-.054445	-.055689	.912990	-.378	.7070
FRQ	.141987	.151774	.997115	1.041	.3031
INT	.114607	.122682	.999952	.838	.4061
WAI	-.042450	.016209	-.356854	-2.619	.0118
Adjusted R Square = .109 Bold = statistically significant					

Table 30. Regression analysis of program ingredients predicting health status at 12-month follow-up measured by the QOLI Health Scale.

Variable	B	SE B	Beta	T	P
PRG	.001037	.076604	.003007	.014	.9893
DAI	.001639	.008552	.030283	.192	.8489
FRQ	-.004194	.003941	-.429766	-1.064	.2933
INT	.008368	.006887	.423743	1.215	.2311
WAI	-.0001468	.002620	-.009352	-.056	.9556
Adjusted R Square = .063 Bold = statistically significant					

Table 31. Regression analysis of program ingredients predicting employment status at 12-month follow-up measured by the QOLI Work & School Scale.

Variable	B	SE B	Beta	T	P
PRG	-1.804667	3.141233	-.120759	-.575	.5686
DAI	-.205976	.353913	-.087831	-.582	.5636
FRQ	.333074	.280527	.462148	1.187	.2416
INT	-.856549	.490546	-.587326	-1.746	.0879
WAI	.098429	.109287	.144745	.901	.3728
Adjusted R Square = .004 Bold = statistically significant					

Section 4. Cost-Effectiveness

Cost-effectiveness evaluation for the purposes of this study is understood as comparison of program outcomes in relation to program costs (Rossi, Freeman, & Lipsey, 1999). Table 32 presents three permutations of annual mental health system costs per client: relapse cost, relapse prevention costs, and total cost.

Repeat measure multivariate analyses indicated no statistically significant program by time effect on any of the cost categories. There was, however, a time effect alone on variance in relapse prevention cost per client. Aggregated case management, outpatient treatment and rehabilitation service costs during the second year post-admission was less than first year costs for both programs. For the ACT clients, however, the increase in average relapse cost was greater than the amount of this reduction.

During the first year post-admission total mental health system cost for ACT clients was 27% less than for SCM clients. During the second year post-admission the SCM average was 6% lower than the ACT average.

Tables 32. Repeated measures multivariate analysis of variance in mental health system costs per client.					
Program	1 st Year Post (T1): Mean (SD)	2nd Year Post (T2): Mean (SD)	Percent Change by Program	Program by Time Effect: F-value	Time Effect: F-value
Relapse treatment costs: Cost of psychiatric inpatient and Residential crisis stabilization service utilization					
SCM	\$16,554 (\$29,251)	\$12,232 (\$27,098)	- 26%	4.4	.810
ACT	\$5,743 (6,363)	\$16,765 (\$31,410)	+ 192%		
Relapse prevention costs: Cost of case management, outpatient treatment & rehabilitation service utilization					
SCM	\$9,104 (\$7,790)	\$4,956 (\$11,148)	- 46%	.678	10.2
ACT	\$12,793 (\$11,512)	\$5,756 (\$1,140)	- 55%		1- β = .88 η^2 = .18
Total mental health system cost					
SCM	\$25,658 (\$29,976)	\$24,682 (\$33,370)	- 4%	.964	.572
ACT	\$18,740 (\$12,589)	\$26,271 (\$30,292)	+ 40%		

Bold = statistically significant ($p < .05$)

1 - β = Power; η^2 = Effect size (eta-squared)

Section 5. Review of Research Hypotheses

Nine research hypotheses and eight sub-hypotheses were tested. These hypotheses addressed the outcome expectations of program stakeholders and the theoretical relationship believed to exist between specific program implementation ingredients or components and outcomes. Findings of the analyses of program implementation and outcome data collected to test these hypotheses have been presented. Implications of these findings for the retention or rejection of these hypotheses will be summarized.

Hypothesis 1

1.1. It was hypothesized that there would be a statistically significant reduction in State psychiatric hospitalization and community-based crisis service

(outpatient crisis intervention and short-term residential crisis stabilization) utilization rates for persons served.

Finding: This hypothesis was not supported. Although there was a statistically significant reduction in the State psychiatric hospital and short-term residential crisis stabilization admission rate, there was no statistically significant reduction in average inpatient treatment and residential crisis stabilization days. There was also no statistically significant reduction in the outpatient crisis intervention service utilization rate.

1.2. Comparisons of program outcome differences would indicate a greater reduction in utilization for persons served by the assertive community treatment program (ACT) than for persons receiving standard case management program (SCM).

Finding: This hypothesis was not supported. There were no statistically significant differences over time between programs in State psychiatric hospitalization and community-based crisis service (outpatient crisis intervention and short-term residential crisis stabilization) utilization rates for persons served.

Hypothesis 2

2.1. There would be a statistically significant improvement in quality of life for persons served.

Finding: This hypothesis was supported. There were statistically significant improvements for several quality of life indicators, including level of participation in activities of daily living, family and social relations, overall subjective and objective quality of life.

2.2. Comparison of program differences would indicate greater gains in quality of life for persons served by the assertive community treatment program than for persons receiving standard case management services.

Finding: This hypothesis was not supported. Program differences were indicated for only three of the twelve quality of life indicators. Clients receiving SCM services evidenced statistically significant gains on two indicators; ACT clients evidenced significant improvement on one indicator.

Hypothesis 3

3.1. There would be a statistically significant reduction in symptom severity for persons served.

Finding: This hypothesis was not supported. There were no statistically significant changes in symptom severity for persons served.

3.2. Comparison of program outcome differences would indicate greater gains for persons served by the assertive community treatment program than for persons receiving standard case management services.

Finding: This hypothesis was not supported. There were no statistically significant differences between programs in symptom severity changes for persons served.

Hypothesis 4

4.1. There would be a statistically significant improvement in the level of functioning of persons served.

Finding: This hypothesis was not supported. There was no statistically significant change in level of functioning for persons served.

4.2. Comparison of program outcome differences would indicate greater gains for persons served by the assertive community treatment program than for persons receiving standard case management services.

Finding: This hypothesis was supported. Statistically significant improvement in functioning was evidenced by ACT clients.

Hypothesis 5

There would be a statistically significant difference between programs in client satisfaction with services. Comparison of program outcome differences would indicate a higher level of service satisfaction for persons served by the assertive community treatment program than for persons receiving standard case management services.

Finding: This hypothesis was not supported. There was no statistically significant difference in service satisfaction between programs.

Hypothesis 6

6.1. There would be a statistically significant difference between programs in the strength of the working relationship between clients and service providers. Comparison of program differences would indicate a stronger working relationship between persons served and providers of assertive community treatment services than for persons receiving standard case management services.

Finding: This hypothesis was supported. There was a statistically significant difference between programs, with stronger client-case manager working relationships evidenced by the SCM program.

6.2. It was further hypothesized that the strength of the working alliance would be positively associated with outcome indicators.

Finding: This hypothesis was supported. Strength of the working relationship evidenced a statistically significant positive association with several outcome indicators, including lower relapse rates (inpatient psychiatric treatment and crisis service utilization rates), higher medication compliance, higher family involvement, lower victimization and arrest rate, and higher overall subjective and objective quality of life.

Hypothesis 7

7.1. There would be a statistically significant difference between programs in level of medication compliance attained. Comparison of program differences would indicate higher levels of medication compliance for assertive community treatment clients than for standard case management clients.

Finding: This hypothesis was not supported. There was no statistically significant difference in levels of medication compliance between the ACT and SCM programs.

7.2. It was further hypothesized that medication compliance levels would be positively associated with outcome indicators.

Finding: There was support for this hypothesis. Higher medication compliance level was positively associated with higher self-rated functioning and participation in activities of daily living.

Hypothesis 8

8.1. There would be a statistically significant difference between programs in the frequency of service contacts provided. Comparison of program differences would indicate greater frequency of service contacts for assertive community treatment clients than for clients receiving standard case management services.

Finding: This hypothesis was supported. The ACT clients received a higher frequency of service contacts

than SCM clients did. The difference between programs was statistically significant.

8.2. There would be a statistically significant difference between programs in intensity of services provided. Comparison of program differences would indicate greater intensity of services for assertive community treatment clients than for clients receiving standard case management services.

Finding: This hypothesis was supported. The ACT clients received a higher intensity of service contacts than SCM clients did. The difference between programs was statistically significant.

8.3. It was further hypothesized that service contact frequency and intensity would be positively associated with outcome indicators.

Finding: There was support for this hypothesis. Both service frequency and intensity were positively with lower symptom severity. Service contact frequency evidenced a statistically significant positive association with higher residential stability. Service intensity evidenced a statistically significant positive association with clinician-rated level of functioning.

Hypothesis 9

The assertive community treatment program would be cost-effective compared to standard case management.

Finding: This hypothesis was not supported. There was no statistically significant difference between

programs based on average mental health system cost per person served. With mixed results on evidence of significant differences in overall outcomes produced, cost-effectiveness of assertive community treatment is not demonstrated convincingly.

This chapter presented results of the data analysis. Altogether, eight of the seventeen research hypotheses were supported. The next chapter presents discussion of the significance of these findings in relation to the research questions and in relation to other studies on the efficacy and cost-effectiveness of case management programs. Implications for further research would be explored.

CHAPTER V

DISCUSSION

This final chapter reviews the objectives and results of the study. The significance of study results will be assessed through comparison with published findings on the efficacy and cost-effectiveness of assertive community treatment. Usefulness of the theory-driven approach to program evaluation will be assessed in conjunction with discussion of study results. Next study design limitations on interpretation and generalizability of the findings will be assessed. In conclusion, implications of study findings for future research directions will be discussed.

Study Objectives

The primary objective of this study was to contribute data that may assist resolution of continuing questions regarding whether evidence of efficacy and cost-effectiveness is sufficient to justify moving ACT into standard practice. Use of a theory-driven research design as well as attention to design sensitivity and methodological rigor were key strategies for realizing that goal. The secondary objective was to assess the theory-driven approach to program evaluation.

The usefulness of four case management program theories for explaining and comparing outcome results are discussed. One theory stipulates that positive outcome impact is more likely when program implementation incorporates specific structural components (Dixon, 2000; Bond et al., 2001). These components

have been published as critical ingredients, fidelity criteria or model prescriptions (McGrew & Bond, 1995; McGrew, Wilson, & Bond, 1996; Rapp, 1998; and Teague, Bond, & Drake, 1998). To be differentiated from theories regarding the overall structure of an effective program, frequency and intensity of service delivery contacts have been identified as a structural subset believed to be critical ingredients (Dietzen & Bond, 1993; Sherman & Ryan, 1998; Brekke et al., 1999; and Kuno, Rothbard, & Sands, 1999).

A third program theory identifies strength of the working relationship as a mediating variable or mechanism critical to achieving intended outcomes (Lieberman & Moss, 1994; Neale & Rosenheck, 1995; Solomon, Draine, & Delaney, 1995; Howgego et al., 2003). Goering and associates (1988, p. 275) postulated the "relationship between the case manager and the patient may be the most potent therapeutic factor" of case management programs. A fourth program theory suggests the degree of case management focus on medication compliance through symptom and medication use may be a key mediator of outcomes (Kane, 1985; Corrigan et al., 1990; & McGrew & Bond, 1995; Mueser et al., 1998).

Study Results

Subsections for the following outcome categories organize this discussion of study results: hospitalization and crisis service utilization, clinical status, quality of life, satisfaction with services, and cost-effectiveness. Discussion of outcome measurement findings will incorporate assessment of the adequacy of program theory to explain differences between intended and actual results and differences between programs.

Comparisons to other published randomized controlled studies of case management outcomes will also be presented.

Hospitalization and Crisis Service Utilization

Review of 23 published random assignment studies to compare ACT and SCM results for impact on reducing hospital use rates (number of inpatient days) indicated that 74 percent found that ACT was more effective. Of the 7 studies with follow-up duration of 24 or more months or more, 3 found ACT to be more effective, 4 did not. This study adds to the evidence that ACT is not more effective.

Most published randomized studies of ACT outcomes do not report impact on hospital admissions. The recent meta-analysis of effectiveness of mental health case management conducted by Ziguras and Stuart (2000), 10 of the 19 selected randomized studies reported impact on hospital admission rate. Only 4 of these studies evaluated ACT programs. This is surprising considering the emphasis placed by ACT programs on reduction of hospital recidivism rates.

Based on the 14 ACT studies reporting inpatient days used, and 4 reporting admission rates, Ziguras and Stuart concluded ACT was more effective than SCM in reducing overall hospital use rates. Their findings supported similar findings of a prior meta-analysis study by Marshal and associates (1998).

Published studies have not addressed impact on overall relapse rates to determine whether reduction in hospital use is offset by community-based crisis service use. A distinguishing feature of this study is assessment of impact on overall relapse

rate that combines inpatient and short-term residential crisis stabilization use rates. The result of that analysis was that ACT programs are not more effective than SCM in reducing the overall relapse rate. The impact of the case management programs on overall recidivism (admission) rates was, however, significant. Discussion of these results now shifts to analysis of the relative usefulness of the program theories to explain these differences.

With this ACT program evidencing a high IFACT score indicating a high level of fidelity to the ACT model, this study does not support the usefulness this program theory to explain outcome results. This study also did not replicate the finding of studies indicating service contact frequency and intensity are positively associated with hospital use rates. Although the average frequency and intensity of contacts evidenced by the ACT program exceeded the minimums specified by fidelity criteria, the results were not significantly better over time when compared with SCM results. The SCM program average levels of frequency and intensity were significantly less than ACT and well below the fidelity standard. Rapp (1998, p. 373) observed that service contact levels and hospital use rates.

"will never be truly linear since those who are most ill will often receive the most contact but may also have higher rates of hospitalization (even if reduced compared to similar control subjects, " and that "the quality of the contact, not just frequency, may be a mitigating factor. For example, small caseloads employing ineffective methods or skill-deficit case managers would probably be ineffective. The study by Hornstra et al. (1993) is illustrative. A brokerage model intervention with small caseloads and significantly more caseworker contact produced no client outcome differences compared to the control group"

Although there are not other studies available for comparison, the measure of medication compliance was not associated with hospital use rates. Findings of studies indicating strength of the client - case manager working relationship are positively associated (one-tailed tests of significance) with reduced hospital use rates are supported. These findings extend beyond hospital admission rates to the overall recidivism rate and to outpatient crisis intervention use rates. Effect sizes were medium to large.

Clinical Status

Published findings on the impact of ACT programs for improving medication compliance, reducing symptom severity and improving level of functioning has been mixed. Mueser and associates' (1998) review of case management research indicated 50 percent of randomized control studies found no evidence of efficacy for improving medication compliance, with 56 percent indicating no difference for reducing symptom severity, and with 76 percent indicating no difference for improving level of functioning (social adjustment and vocational indicators). The meta-analytic study conducted by Ziguras and Stuart (2000, p. 1417) concluded, however, that ACT and SCM "appear to be equally effective" in reducing symptom severity and improving functioning. Only a few studies have evaluated medication compliance outcomes and are not included in the meta-analytic reviews.

The findings of this study on the impact of ACT for improving clinical status outcome indicators are consistent with previous research findings. Both clinician and client-rated measures of level of functioning evidenced statistically significant improvement for ACT clients compared to SCM. Measures of medication compliance and symptom severity levels evidenced no statistically significant change.

As was evidenced for hospital and crisis service outcomes, fidelity to the structural model appears is apparently not useful to explain differences in outcomes. Frequency and intensity of service contacts are, however, associated with levels of symptom severity. Regression analyses indicated higher levels of frequency and intensity are associated with lower levels of clinician-rated indicators of symptom severity and higher level of functioning. In accordance with Rapp's (1998) reasoning on the relationship of service contact levels with hospital use, similarly it is reasonable to anticipate that an effective case manager will titrate level of contact in accordance with level of need evidenced by symptom severity and functional impairment.

Although program theories regarding a potentially positive association between strength of the working relationship and two of the clinical outcome indicators (symptomatology and level of functional) were not supported by this study, there was a positive association with higher levels of medication compliance. These findings therefore replicate results of the study by Solomon and associates (1995) that identified a positive linkage

between strength of the working alliance and attitude toward medication compliance.

Howgego and associates (2003, p. 180) observed that "this was a very pertinent finding as case managers spend a good proportion of their time monitoring medication, and some services devote after-hours teams to the delivery and supervision of medication to patients". Analysis of case manager time allocations during the course of this study indicated medication compliance was the most prevalent content of service contacts for both the ACT and SCM programs.

Quality of Life

Published program evaluation studies indicate use of a wide range of measures to assess the impact of case management services on subjective and objective quality of life indicators. Several of these indicators were measured in this study and are comparable to the general findings of reviews of randomized assignment studies of ACT that covering quality of life outcomes (Mueser et al., 1998; Ziguras & Stuart, 2000). The findings of this study are consistent with the conclusions of those reviews that evidence is mixed on the comparative efficacy of ACT and SCM programs in improving quality of life for persons served.

Positive impact on subjective quality of life was reported in 58 percent of the randomized studies. This study found no statistically significance impact on subjective quality for ACT and SCM clients. Of 10 objective quality of life indicators measured in this study, 4 were addressed in the referenced review: housing stability, arrest rate, social adjustment and

vocational functioning (employment status). ACT clients evidenced significantly improved housing stability in this study (large effect size), whereas housing stability worsened for SCM clients. SCM clients evidenced significant improvement (large effect size) in social adjustment compared with no significant difference for ACT.

Mueser and associates' review indicated 67 percent of the studies found positive impact on housing stability for ACT compared to SCM programs. Only 23 percent of the studies indicated improved social adjustment for ACT clients. The meta-analysis conducted by Ziguras and Stuart addressed only one quality of life indicator, social functioning, and found no significant difference in efficacy of ACT compared with SCM programs for improving the social functioning for persons served (mean effect sizes were small for both).

Changes in arrest rates and employment status for persons served by either program were not statistically significant. Mueser and associates' review found no difference reported for these indicators in 70 percent and 63 percent of the studies respectively.

The usefulness of the four program theories for explaining the outcomes for subjective and objective quality of life indicators was also mixed. For the majority of quality of life indicators, strength of the client case-manager working relationship was the most significant predictor of outcome. Results of regression analyses indicated a positive association between strength of the working alliance and overall subjective

and objective quality of life (composite of objective indicators). In addition these general indicators, strength of the working alliance is positively associated with improved family involvement levels and lower rates of victimization and arrests. For overall quality of life, these findings concur with similar findings reported by Solomon, Draine, and Delaney (1995).

Medication compliance level was positively associated with both quality of life indicators addressing functional status: higher level of self-rated overall functioning and in combination with use of ACT program services was a significant predictor of higher levels of self-reported participation in activities of daily living (ADL). Although the positive association between levels of medication compliance and functioning seems intuitively plausible, the association with receipt of ACT services requires further examination. For this indicator a structural component of ACT is provision for a proportionally higher level of *in vivo* services than SCM. Analysis of the content of case manager contacts during the course of this study indicated that assisting with transportation to facilitate client access to community services represented a greater proportion of ACT time allocations than SCM.

Use of SCM services was a significant predictor of higher levels of social interaction (a social adjustment indicator). Explanation of why SCM clients evidenced significant improvement in level of social interaction and ACT evidenced no significant change may indicate an adverse effect of ACT program structure. Whereas high levels of service contact *in vivo* assists with

improved ADL participation, it may inhibit development of a natural social support system. Among criticisms of the ACT model is that the intensity of services may be "coercive and paternalistic" (Gomory, 1999; Thornicroft, 2000) and can create "dependency" (Thompson, Griffith, & Leaf, 1990; Levine, Toro, & Perkins, 1993; McGrew, Wilson, & Bond, 1996).

None of the program theories was a significant predictor of outcome for the following quality of life indicators: homelessness, health and employment status. There were no statistically significant changes for measures of the indicators, nor differences between programs.

Satisfaction with Services

Reviews of studies comparing ACT and SCM levels of client satisfaction have presented contradictory findings. Mueser and associates (1998) indicate 88 percent of the randomized studies they identified reported ACT programs are more efficacious for improving client service satisfaction than for SCM. The Ziguras-Stuart meta-analysis (2000) reported that ACT and SCM appear to be equally effective in increasing client satisfaction with services. In finding no statistically significant difference between the programs based on service satisfaction levels, this study concurs with the meta-analytic finding.

The only program theory indicating usefulness for predicting improved client satisfaction with services is strength of the working relationship. Regression analysis indicated a strong working relationship is a significant predictor (large effect size) of higher client satisfaction with services. This is a

finding also reported by the Solomon study (1995) of the relationship between working alliance and outcomes.

Cost-effectiveness

Two reviews of ACT cost-effectiveness studies have been published (Latimer, 1999; Ziguras & Stuart, 2000). Latimer's review included 19 randomized studies; the Ziguras - Stuart meta-analysis included 6 that met their study quality criteria. The former concluded that ACT programs are cost-effective when two conditions are met: high adherence to ACT model fidelity criteria and targeting of ACT to serve persons averaging 50 or more psychiatric inpatient treatment days per year.

The program theory set forth by Latimer is that a high fidelity ACT program will reduce inpatient psychiatric treatment use "by about 58 percent over 1 year if the alternative involves some type of case management.. ". With admission of persons evidencing 50 or more inpatient days annually, reduced inpatient treatment costs will offset ACT program costs to achieve a break even on costs. Superior outcome results combined with equal or lower costs than standard case management would establish cost-effectiveness.

The ACT program evaluated by this study was cost-effective in the first year based on these criteria. The 2- year analysis of cost-effectiveness presented by this study indicates that ACT programs may not be cost-effective compared to SCM for persons served beyond one year. The Ziguras-Stuart meta-analysis concluded that both ACT and SCM programs reduce costs, but

cautioned that differing cost calculation methods used by the studies limit confidence in the finding.

Study results have been compared to the findings of published evaluations of the efficacy and cost-effectiveness of assertive community treatment. The usefulness of four ACT program theories derived from the literature on ACT programs has also been reviewed. Before turning attention to analysis of the impact of study design limitations on interpretation and generalizability of the findings, observations on the emergence of strength of the working relationship as a significant predictor of case management outcomes will be offered.

Working Alliance

The regression analyses identified strength of the working relationship as a significant predictor for a larger proportion of the intended outcomes than explained by the independent variable (receipt of ACT or SCM program services) or by any one of the other intervening variables. Outcome (dependent) variables positively associated with strength of the working relationship include measures of relapse or recidivism (inpatient treatment and crisis service use), medication compliance, satisfaction with life, objective quality of life indicators, and satisfaction with services.

Presence of a statistically significant difference between the SCM and ACT programs based on strength of the client-case manager working relationship in conjunction with these outcome linkages raises questions about potential flaws in ACT program theory specifying structural components believed to be linked to

the intended outcomes. In particular, if a strong 1:1 client case-manager relationship is a key factor for attainment of intended outcomes, use of the shared caseload approach, a hallmark of ACT programs, may be questionable.

In two studies of client perspectives on the helpful ingredients of ACT programs, the helping relationship emerged as the feature most valued by clients (McGrew, Wilson, & Bond, 1996; Redko, Durbin, Wasylenki, & Krupa, 2004). It is surprising that the researchers were surprised that this finding "emerged even within a model that uses a team approach to treatment employing multiple treaters and, presumably, requiring the formation of multiple individual relationships" (McGrew, Wilson, & Bond, 1996, p. 19).

It is not only plausible, as the researchers assert, but highly likely that the strength of the working relationship that is critical to other models of helping (Greenson, 1965; Strong, 1968; Bordin, 1976; Orlinsky & Howard, 1986; Gaston, 1990;) is no less important to the effectiveness of case management. Although there is in theory significant overlap between supportive psychotherapy and case management, not very much is known about the nature of the working relationship in assertive community treatment or other case management models (Baker & Weiss, 1984; Goering & Stylianios, 1988; Solomon, Draine, & Delaney, 1995; McGrew, Wilson, & Bond, 1996; and Howgego et al., 2003).

Tables 33 and 34 present overview of the findings of outcomes and cost analysis. Before further exploration of

Table 33. Outcome measurement result summary.				
Outcome Variable	Assertive Community Treatment	Standard Case Management	Intervening Variables	Overall Difference (all clients)
Relapse Rate			Working Relationship (+)	+
Symptom Severity			Service Frequency & Intensity (-)	
Medication Compliance			Working Relationship (+)	
Level of Functioning	+	-	Service Intensity (+)	
Subjective Quality of Life			Working Relationship (+)	
Satisfaction with Services			Working Relationship (+)	
Objective Quality of Life Indicators:				
Activities of Daily Living	+		Program Structure & Medication Compliance (+)	+
Arrest Rate			Working Relationship (-)	
Victimization Rate			Working Relationship (-)	
Family Relations			Working Relationship (+)	+
Level of Functioning	+	-	Medication Compliance (+)	
Health Status				
Homelessness Rate			Program Structure (+)	
Residential Stability	-	+	Program Structure (+)	
Social Relations		+	Program Structure (+)	+
Employment Status				
Overall Quality of Life			Working Relationship (+)	+

+ = Statistically significant improvement or positive association (p < .05)

- = Statistically significant decline or negative association (p < .05)

implications for program management, research, and public policy, limitations of the study design and methods, and the impact of these limitations on the interpretation and generalizability of findings will be reviewed.

Table 34. Annual public mental health system cost per person served.		
Program	First Year Post-Admission*	Second Year Post-Admission*
Assertive Community Treatment	\$18,740	\$26,271
Standard Case Management	\$25,658	\$24,682

* Difference not statistically significant.

Study Limitations

As indicated at the conclusion of the chapter presenting the study design and methodology, use of a randomized assignment eliminates most threats to internal validity. Those remaining are methodological problems (Dennis, 1990): (1) treatment dilution, (2) treatment contamination or confounding due to compensatory rivalry and "Hawthorne effect", (3) inaccurate case flow and power estimates, (4) violations of the random assignment process, (5) changes in the environmental context, and (6) changes in the treatment regimens. Discussion of potential impact will include identification of mitigating factors that may limit the threats.

Treatment dilution: Variation in the amount type and amount of the treatment received makes it difficult to interpret results. As discussed earlier, this has historically been significant methodological challenge for case management evaluations. The solution applied in this study is to account for program implementation fidelity and to measure key indicators of the strength of service delivery including service contact

frequency and intensity, and strength of the working relationship.

Treatment contamination: Compensatory rivalry or "Hawthorne effect" were potential problems for the study. Length of the study is perhaps a factor that would reduce the threat. After a certain point in the study, program staff members were expected to focus on business as usual and be less aware of the ongoing evaluation research.

Inaccurate caseflow and power estimates: This problem exists when there is no direct data to estimate expected caseflow, which consequently prevents estimation of effect sizes and sampling needed for adequate statistical power. Caseflow data was available during the planning process thereby avoiding this problem.

Violations of the random assignment process: Although not within control of the researcher, the low attrition rate was a minimal threat (one subject lost).

Changes in the environmental context: There were no identified changes that would pose a threat to validity, for example, during the study timeframe there was no staff turnover for the programs evaluated, no significant changes in the funding and regulatory environment.

Changes in the treatment regimen: Although the programs evaluated continued some degree of evolution, program operating procedures had been well established for a significant period of time prior to initiation of the study.

In addition to the threats to study validity presented by these potential methodological problems, threats to generalizability are intrinsic to program evaluations. The findings of an evaluation of two programs operating in one community do not readily generalize to other contexts. To reduce the threat to generalizability, program descriptions and implementation assessment data are provided.

Implications

The findings of this study challenge some of the ACT program theories specifying ingredients or components believed to critical to intended outcomes, and some are supported. In particular, this study provides preliminary evidence that the structural standards for ACT programs, known as fidelity measures, promote components that have not been empirically tested for positive linkage to intended outcomes nor for the possibility of adverse effects. For example, as previously discussed the findings of this study not only support the need for further research on the nature of the helping relationship but also the need for research on the effectiveness of the shared caseload approach.

Although some clients may be capable of establishing strong working relationships with multiple team members, more fragile clients may not only find that to be very difficult but overwhelming. There is no empirical basis for assuming the shared caseload approach will be helpful for all who may need the intensive supports, nor that the individual caseload approach will be helpful for all. Based on the findings of this study, the

benefits of a strong working relationship may be more critical to the attainment of desired outcomes than the shared caseload, team approach.

Beyond concerns that the team approach may be counterproductive in blocking development of strong client-case manager working relationship requisite of positive outcomes, there is little empirical data to indicate which structural components of the prescriptive model or fidelity criteria are responsible for which result or outcome (Ganju, 2003). Although data on essential structural components would be helpful to program managers and policy makers, other researchers are anxious to move beyond "simplistic issues such as the ratio of staff members to clients" to "detailed evaluation of rehabilitation procedures" (Wykes & Holloway, 2000, p. 199).

As long as the active ingredients of successful case management models, such as assertive community treatment remain unspecified empirically, assessment of negative program implementation results will not be able to determine whether the model failed or whether fidelity to the model was not maintained (Thornicroft et al., 1999; Wykes & Holloway, 2000). Although this is one study is a long stream of research on assertive community treatment, there seems to be more compelling evidence of the former than the latter.

Proponents of the current model have also called for examination of what ACT programs are not achieving in terms of realizing the rehabilitation and recovery goals of persons served. For example, most ACT programs, including the one

evaluated by this study, have not focused on vocational outcomes despite evidence of effectiveness of supported employment and its compatibility with ACT. ACT programs have also not adequately incorporated evidence-based practices for social skills training and development of social networks, nor family psychoeducational support (Bond et al., 2001; Dixon et al., 2001; Mueser et al., 2002).

Conclusions

The results of this study challenge the perspective that evidence of the efficacy and cost-effectiveness of assertive community treatment is well established and sufficient to support its movement into standard practice. The inconsistent and contradictory results of replications indicate need for tested, evidence-based practice guidelines for ACT and similar intensive clinical case management programs. In the absence of guidelines for reliable replication, policy makers and funding sources have no reasonable assurance of cost-effectiveness.

Development and testing of practice guidelines will necessitate shifting research resources into the examination of treatment and rehabilitative interventions that are adaptable to *in vivo* delivery.

Another direction for case management research is to establish evidence of the efficacy of other intensive case management models (ICM) such as strengths-based case management. Several features of these case management models are similar to ACT. A key difference, however, is use of individual caseloads instead of shared caseloads used by ACT programs (Rapp, 1998).

Although the ICM model is not as well defined and extensively researched as ACT, the results of a small number of studies have been similar to ACT (Bond et al., 2001). The findings of this study would indicate ICM might offer an effective alternative to ACT.

Research comparing the efficacy and cost-effectiveness of ICM and ACT could provide an opportunity for component testing. Examining the contribution of shared caseloads versus individual caseloads to client outcomes would be a propitious first step. The theory-driven approach is well suited to this type of program evaluation.

This study has aspired to demonstrate a strength of the theory-driven approach to program evaluation: ability to disentangle program implementation success or failure from the validity of the program model (Donaldson & Scriven, 2003). Extricating this information enables identification of faulty program models that have little prospect for consistent success even if the model is adequately operationalized (Rossi, Freeman, & Lipsey, 1999).

REFERENCES

- Aberg-Wistedt, A., Cresell, T., Lindberg, Y., Liljenberg, B., & Osby, U. (1995). Two-year outcome of team-based intensive case management for patients with schizophrenia. *Psychiatric Services*, 46, 1263-1266.
- Adair, C., McDougall, G., Beckie, A., Joyce, A., Mitton, C., Wild, C., Gordon, A., & Costigan, N. (2003). History and measurement of continuity of care in mental health services and evidence of its role in outcomes. *Psychiatric Services*, 54, 1351-1356.
- Allness, D., & Knoedler, W. (1998). 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.
- Anthony, W., & Blanch, A. (1989). Research on community support services: What have we learned? *Psychosocial Rehabilitation Journal*, 12, 55-81.
- Anthony, W., Cohn, M., Farkas, M., & Cohen, B. (1988). Clinical care update: The chronically mentally ill: Case management - more a response to a dysfunctional system. *Community Mental Health Journal*, 24, 219-228.
- Anthony, W., Forbess, R., & Cohen, M. (1993). Rehabilitation oriented case management. In M. Harris, & H. Bergman (Eds.), *Case management for mentally ill patients: Theory and practice*. Chur, Switzerland: Harwood Academic Publishers.
- Arrindell, W., van Nieuwenhuizen, C., & Luteijn, F. (2001).

- Chronic psychiatric status and satisfaction with life. *Personality and Individual Differences*, 31, 145-155.
- Atkinson, M., & Caldwell, L. (1997). The differential effects of mood on patients' ratings of life quality and satisfaction with their care. *Journal of Affective Disorders*, 44, 169-175.
- Atkinson, M., Zibin, S., & Chuang, H. (1997). Characterizing quality of life among patients with chronic mental illness: A critical examination of the self-report methodology. *American Journal of Psychiatry*, 154, 99-106.
- Attkisson, C., & Greenfield, T. (1995). The Client Satisfaction Questionnaire (CSQ) scales. In L. L. Sederer & B. Dickey (Eds.), *Outcome assessment in clinical practice*. Baltimore, MD: Williams & Wilkins.
- Attkisson, C., & Greenfield, T. (1994). Client Satisfaction Questionnaire-8 and Service Satisfaction Scale-30. In M. E. Maruish (Ed.), *The use of psychological testing for treatment planning and outcome assessment*. Hillsdale, NJ: Lawrence Erlbaum.
- Attkisson, C., & Pascoe, G. (1983). Patient satisfaction in health and mental health services. *Evaluation and Program Planning*, 6, 185-418.
- Awad, A. (1993). Subjective response to neuroleptics in schizophrenia. *Schizophrenia Bulletin*, 19(3), 609-618.
- Bachrach, L. (1989). Case management: Toward a shared definition. *Hospital and Community Psychiatry*, 40(9), 883-884.

- Bachrach, L. (1993). Continuity of care and approaches to case management for long-term mentally ill patients. *Hospital and Community Psychiatry*, 44, 465-468.
- Baker, F., & Intagliata, J. (1982). Quality of life in the evaluation of community support systems. *Evaluation and Program Planning*, 5, 69-79.
- Baker, F., & Intagliata, J. (1992). Case management. In R. Liberman, *Handbook of Psychiatric Rehabilitation*. New York: Macmillan Publishing Company.
- Baker, F., Jodrey, D., & Intagliata, J. (1992). Social support and quality of life of community support clients. *Community Mental Health Journal*, 28, 397-411.
- Baronet, A., & Gerber, G. (1998). Psychiatric rehabilitation: Efficacy of four models. *Clinical Psychology Review*, 18, 189-228.
- Barrett-Lennard, G. (1986). The relationship inventory now: Issues and advances in theory, method, and use. In L. Greenberg & L. Pinsof (Eds.), *Psychotherapeutic process: A research handbook*. New York: Guilford Press.
- Barry, K., Zeber, J., Blow, F., & Valenstein, M. (2003). Effect of strengths model versus assertive community treatment model on participant outcomes and utilization: Two-year follow-up. *Psychiatric Rehabilitation Journal*, 26, 268-277.
- Barton, R. (1999). Psychosocial rehabilitation services in community support systems: A review of outcomes and policy recommendations. *Psychiatric Services*, 50, 525-534.
- Battle, C., Imber, S., Hohen-Saric, R., Stone, A., Nash, E., &

- Frank, J. (1966). Target complaints as a criterion of improvement. *American Journal of Psychotherapy*, 20, 184-192.
- Becker, R., Meisler, N., Stormer, G., & Brondino, M. (1999). Employment outcomes for clients with severe mental illness in a PACT model replication. *Psychiatric Services*, 50, 104-106.
- Bedell, J., Cohen, N., & Sullivan, A. (2000). Case management: the current best practices and the next generation of innovation. *Community Mental Health Journal*, 36, 179-194.
- Belcher, J. (1988). Are jails replacing the mental health system for the homeless mentally ill? *Community Mental Health Journal*, 24(3), 185-195.
- Belcher, J. (1992). Plan implementation and coordination: Clinical case management with the chronically mentally ill. In B. Vourlekis & R. Greene (Eds.), *Social work case management*. New York: Aldine de Gruyter.
- Bellack, A., & Blanchard, J. (1993). Schizophrenia: Psychopathology. In A. Bellack & M. Hersen (Eds.), *Psychopathology in adulthood*. Boston: Allyn and Bacon.
- Bellack, A., & Brown, S. (2001). Psychosocial treatments for schizophrenia. *Current Psychiatry Reports*, 3, 407-412.
- Bellack, A., & Mueser, K. (1993). Psychosocial treatment for schizophrenia. *Schizophrenia Bulletin*, 19(2), 317-336.
- Berk, R., Boruch, R. Chambers, D., Rossi, P., & Witte, A. (1985). Social policy experimentation: A position paper. *Evaluation Review* 9:387-429.

- Bickman, L., & Peterson, K. (1990). Using program theory to describe and measure program quality. In L. Bickman (Ed.), *Advances in program theory*. San Francisco: Jossey-Bass, Inc.
- Bjorkman, T., Hansson, L., & Sandlund, M. (2002). Outcome of case management based on the strengths model compared to standard care: A randomized controlled trial. *Social Psychiatry and Psychiatric Epidemiology*, 37, 147-152.
- Bodenheimer, T. (1999). Disease management promises and pitfalls. *New England Journal of Medicine*, 340, 1202-1204.
- Bond, G. (1991). Variations in an assertive outreach model. *New Directions for Mental Health Services*, 52, 65-80.
- Bond, G., Drake, R., Mueser, K., & Latimer, E. (2001). Assertive community treatment for people with severe mental illness: Critical ingredients and impact on patients. *Disease Management Health Outcomes*, 9, 141-159.
- Bond, G., McGrew, J., & Fekete, D. (1995). Assertive outreach for frequent users of psychiatric hospitals: A meta-analysis. *The Journal of Mental Health Administration*, 22, 4-16.
- Bond, G., Miller, L., Krumwied, R., & Ward, R. (1988). Assertive case management in three CMHCs: A controlled study. *Hospital and Community Psychiatry*, 39, 411-418.
- Bond, G., Witheridge, T., Dincin, J., Wasmer, D., Webb, J., & De Graaf-Kaser, R. (1990). Assertive community treatment for frequent users of psychiatric hospitals in a large city: A controlled study. *American Journal of Community Psychology*, 18, 865-891.

- Boruch, R., & Wothke, W. (1985). Seven kinds of randomization plans for designing field experiments. In R. Boruch & W. Wothke (Eds.), *Randomization and field experimentation*. San Francisco: Jossey-Bass.
- Bradburn, N. (1969). *The structure of psychological well-being*. Chicago: Aldine.
- Brekke, J. (1987). The model-guided method for monitoring program implementation. *Evaluation Review*, 11(3), 281-299.
- Brekke, J., Ansel, M., Long, J., Slade, E., & Weinstein, M. (1999). Intensity and continuity of services and functional outcomes in the rehabilitation of persons with schizophrenia. *Psychiatric Services*, 50, 248-256.
- Brekke, J., Long, J., Nesbitt, N., & Sobel, E. (1997). The impact of service characteristics in functional outcomes from community support programs for persons with schizophrenia: A growth curve analysis. *Journal of Consulting and Clinical Psychology*, 65, 461-475.
- Breslin, N. (1992). Treatment of Schizophrenia: Current practice and future promise. *Hospital and Community Psychiatry*, 43(9), 877-885.
- Burns, B., & Swartz, M. (1994). *Hospital without walls: Video study guide*. Durham, NC: Division of Social and Community Psychiatry, Department of Psychiatry, Duke University Medical Center.
- Burns, T. (1996). Case management: Two nations still divided. *Psychiatric Services*, 47, 793.
- Burns, T. (2000). Models of community treatments in

- schizophrenia: Do they travel? *Acta Psychiatrica Scandinavica*, 102 (Suppl. 407), 11-14.
- Burns, T., Creed, F., Fahy, T., Thompson, S., Tyrer, P., & White, I. (1999). Intensive versus standard case management for severe psychotic illness: A randomised trial. *The Lancet*, 353, 2185-2189.
- Burns, T., Fioritti, A., Holloway, F., Malm, U., & Rossler, W. (2001). Case management and Assertive community treatment in Europe. *Psychiatric Services*, 52, 631-636.
- Burns, T., & Perkins, R. (2000). The future of case management. *International Review of Psychiatry*, 12, 212-218.
- Callahan, D. (1999). Balancing efficiency and need in allocating resources to the care of persons with serious mental illness. *Psychiatric Services*, 50, 664-666.
- Campbell, D., & Fiske, D. (1959). Convergent and discriminant validity by the multitrait-multimethod matrix. *Psychological Bulletin*, 56, 81-105.
- Campbell, D., & Stanley, J. (1963). *Experimental and quasi-experimental designs for research*. Boston: Houghton Mifflin.
- Capri, S. (1994). Methods of evaluation of the direct and indirect costs of long-term schizophrenia. *Acta Psychiatrica Scandinavica*, 89, 80-83.
- Caron, J., Tempier, R., Mercier, C., & Leouffre, P. (1998). Components of social support and quality of life in severely mentally ill, low income individuals and a general population group. *Community Mental Health Journal*, 34, 459-476.

- Center for Mental Health Services (2001). Mental Health, United States, 2000. (Rep. Not DHHS Pub. No. (SMA) 01-3537). Washington, DC: U.S. Government Printing Office.
- Chamberlain, R., & Rapp, C. (1991). A decade of case management: A methodological review of outcome research. *Community Mental Health Journal*, 27, 171-187.
- Chambless, D., & Hollon, S. (1998). Defining empirically supported therapies. *Journal of Consulting and Clinical Psychology*, 66, 7-18.
- Chen, H. (1990). Theory-driven evaluations. Newbury Park, CA: Sage.
- Chen, H. & Rossi, P. (1980). The multi-goal, theory-driven approach to evaluation: A model linking basic and applied social science. *Social Forces*, 59, 106-122.
- Chen, H., & Rossi, P. (1983). Evaluating with sense: The theory-driven approach. *Evaluation and Program Planning Review*, 7(3), 283-302.
- Chinman, M., Allende, M., Bailey, P., Maust, J., & Davidson, L. (1999). Therapeutic agents of assertive community treatment. *Psychiatric Quarterly*, 70, 137-162.
- Chinman, M., Rosenheck, R., & Lam J. (2000). The case management relationship and outcomes of homeless persons with serious mental illness. *Psychiatric Services*, 51, 1142-1147.
- Clark, R., & Fox, T. (1993). A framework for evaluating the economic impact of case management. *Hospital and Community Psychiatry*, 44(5), 469-473.
- Coady, N. (1993). The worker-client relationship revisited.

- Families in Society: The Journal of Contemporary Human Services, 74(5), 291-298.
- Cook, T., & Shadish, W. (1986). Program evaluation: The worldly science. Annual Review of Psychology, 3, 193-232.
- Corrigan, P. (2002). Adherence to anti-psychotic medications and health behavior theories. Journal of Mental Health, 11, 243-254.
- Corrigan, P., Liberman, R., & Engel, J. (1990). From noncompliance to collaboration in the treatment of schizophrenia. Hospital and Community Psychiatry, 41(11), 1203-1211.
- Corrigan, P. & Watson, A. (2003). Factors that explain how policy makers distribute resources to mental health services. Psychiatric Services, 54, 501-507.
- Davis, M., & Wagner, E. (1999). Managing chronic disease. British Medical Journal, 318, 1090-1091.
- Deci, P., Santos, A., Hiott, D., Schoenwald, S., & Dias, J. (1995). Dissemination of assertive community treatment. Psychiatric Services, 46, 676-678.
- Degen, K., Cole, N., Tamayo, L., & Dzerovych, G. (1990). Intensive case management for the seriously mentally ill. Administration and Policy in Mental Health, 17, 265-269.
- Deitchman, W. (1980). How many case managers does it take to screw in a light bulb? Hospital and Community Psychiatry, 31, 788-789.
- Dennis, M. (1990). Assessing the validity of randomized field experiments. Evaluation Review, 14, 347-373.

- Dewa, C., Horgan, S., McIntyre, D., Robinson, G., Krupa, T., & Eastabrook, S. (2003). Direct and indirect time inputs and assertive community treatment. *Community Mental Health Journal*, 39, 17-32.
- Dewa, C., Horgan, S., Russell, M., & Keates, J. (2001). What? Another form? The process of measuring and comparing service utilization in a community mental health program model. *Evaluation and Program Planning*, 24, 239-247.
- Dietzen, L. & Bond, G. (1993). Relationship between case manager contact and outcome for frequently hospitalized psychiatric clients. *Hospital and Community Psychiatry*, 44(9), 839-843.
- Dincin, J., Wasmer, D., Witheridge, T., Sobeck, L., Cook, J., & Razzano, L. (1993). Impact of assertive community treatment on the use of state hospital inpatient bed-days. *Hospital and Community Psychiatry*, 44, 833-838.
- Dixon, L. (2000). Assertive community treatment: Twenty-five years of gold. *Psychiatric Services*, 51, 759-765.
- Dobson, L., & Cook, T. (1981). Avoiding Type III error in program evaluations: Results from a field experiment. *Evaluation and Program Planning*, 3, 269-276.
- Donabedian, A. (1990). The quality of care: How can it be assessed? In N. Graham (Ed.), *Quality assurance in hospitals: Strategies for assessment and implementation*. Rockville, MD: Aspen.
- Donabedian, A. (1966). Evaluating the quality of medical care. *Milbank Memorial Fund Quarterly*, 44, 166-206.
- Donaldson, S. (2002). Theory-driven program evaluation in the new

- millennium. In S. Donaldson & M. Scriven (Eds.), *Evaluating social programs and problems: Visions for the new millennium*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Draine, J., Salzer, M., Culhane, D., & Hadley, T. (2002). Role of social disadvantage in crime, joblessness, and homelessness among persons with serious mental illness. *Psychiatric Services*, 53, 565-573.
- Drake, R. (1998). Brief history, current status, and future place of assertive community treatment. *American Journal of Orthopsychiatry*, 68, 172-175.
- Drake, R., & Burns, B. (1995). Special section on assertive community treatment: An introduction. *Psychiatric Services*, 46, 667-668.
- Drake, R., Goldman, H., Leff, H., Lehman, A., Dixon, L., Mueser, K., & Torrey, W. (2001). Implementing evidence-based practices in routine mental health service settings. *Psychiatric Services*, 52, 179-182.
- Drake, R., McHugo, G., Clark, R., Teague, G., Xie, H., Miles, K., & Ackerson, T. (1998). Assertive community treatment for patients with co-occurring severe mental illness and substance use disorder: A clinical trial. *American Journal of Orthopsychiatry*, 68, 201-215.
- Drake, R., Mueser, K., Torrey, W., Miller, A., Lehman, A., Bond, G., Goldman, H., & Leff, H. (2000). Evidence-based treatment of schizophrenia. *Current Psychiatry Reports*, 2, 393-397.
- Drake, R., & Sederer, L. (1986). The adverse effects of

- intensive treatment of chronic schizophrenia. *Comprehensive Psychiatry*, 27(4), 313-326.
- Duan, N., Braslow, J., Weisz, J., & Wells, K. (2001). Fidelity, adherence, and robustness of interventions. *Psychiatric Services*, 52, 413.
- Durbin, J., & Goering, P. (1997). Who gets how much of what: A description of intensive case management. *Psychiatric Rehabilitation Journal*, 20, 49-58.
- Ellison, M., Rogers, E., Sciarappa, K., Cohen, M., & Forbess, R. (1995). Characteristics of mental health case management: Results of a national survey. *The Journal of Mental Health Administration*, 22, 101-125.
- Endicott, J., Spitzer, R., Fleiss, J., & Cohen, J. (1976). The Global Assessment Scale. *Archives of General Psychiatry*, 33, 766-772.
- Essock, S., & Kontos, N. (1995). Implementing assertive community treatment teams. *Psychiatric Services*, 46, 679-683.
- Fiander, M., Burns, T., McHugo, G., & Drake, R. (2003). Assertive community treatment across the Atlantic: Comparison of model fidelity in the UK and USA. *The British Journal of Psychiatry*, 182, 248-254.
- Fielding, N., & Fielding, J. (1986). *Linking data*. Beverly Hills: Sage.
- Finney, J., & Moos, R. (1989). Theory and method in treatment evaluation. *Evaluation and Program Planning*, 12, 307-316.
- Finney, J., & Moos, R. (1992). Four types of theory that can

- guide treatment evaluations. In H. Chen & P. Rossi (Eds.),
Using theory to improve program and policy evaluations. New
York: Greenwood Press.
- Fischer, J., & Corcoran, K. (1994). Measures for clinical
practice. New York: Free Press.
- Forchuk, C., Ouwerkerk, A., Yamaschita, M., & Martin, M. (2002).
Mental health case management in Canada: Job description
analyses. *Issues in Mental Health Nursing*, 23, 477-496.
- Frank, A., & Gunderson, J. (1990). The role of the therapeutic
alliance in the treatment of schizophrenia. *Archives of
General Psychiatry*, 47, 228-236.
- Ganju, V. (2003). Implementation of evidence-based practices in
state mental health systems: Implications for research and
effectiveness studies. *Schizophrenia Bulletin*, 29, 125-131.
- Gehrs, M., & Goering, P. (1994). The relationship between the
working alliance and the rehabilitation outcomes of
schizophrenia. *Psychosocial Rehabilitation Journal*, 18(2),
43-54.
- Glynn, S. (2001). The challenge of psychiatric rehabilitation in
schizophrenia. *Current Psychiatry Reports*, 3, 401-406.
- Goering, P., Stylianos, S. (1988). Exploring the helping
relationship between the schizophrenic client and the
rehabilitation therapist. *American Journal of
Orthopsychiatry*, 58, 271-280.
- Goisman, R. (1998). Social skills training, atypical
neuroleptics, and treatment-refractory psychosis.
International Review of Psychiatry, 10, 84-89.

- Goldman, H., Morrissey, J., Rosenheck, R., Cocozza, J., Blasinsky, M., & Randolph, F. (2002). Lessons from the evaluation of the ACCESS Program. *Psychiatric Services*, 53, 967-970.
- Gomory, T. (2001). A critique of the effectiveness of assertive community treatment. *Psychiatric Services*, 52, 1394.
- Gomory, T. (1999). Programs of assertive community treatment (PACT): A critical review. *Ethical Human Sciences and Services*, 1, 147-163.
- Graham, K., & Birchmore-Timney, C. (1989). The problem of replicability in program evaluation: The component solution using the example of case management. *Evaluation and Program Planning*, 12, 179-187.
- Green, R., & Gracely, E. (1987). Selecting a rating scale for evaluating services to the chronically mentally ill. *Community Mental Health Journal*, 23(2), 91-102.
- Guthrie, E. (2000). Psychotherapy for patients with complex disorders and chronic symptoms: The need for a new research paradigm. *British Journal of Psychiatry*, 177, 131-137.
- Haase, R., Ellis, M., & Ladany, N. (1989). Multiple criteria for evaluating the magnitude of experimental effects. *Journal of Counseling Psychology*, 36(4), 511-516.
- Hafkenscheid, A. (1993). Reliability of a standardized and expanded Brief Psychiatric Rating Scale: A replication study. *Acta Psychiatrica Scandinavica*, 88, 305-310.
- Hafkenscheid, A. (1991). Psychometric evaluation of a

- standardized and expanded Brief Psychiatric Rating Scale.
Acta Psychiatrica Scandinavica, 84, 294-300.
- Hall, J., Carswell, C., Walsh, E., Huber, D., & Jampoler, J.
(2002). Social Work, 47, 132-141,
- Harris, M. (1988). New directions for clinical case management.
In M. Harris & L. Bachrach (Eds.), Clinical case management.
San Francisco: Jossey-Bass.
- Harris, M., & Bergman, H. (1987). Case management with the
chronically mentally ill: A clinical perspective. American
Journal of Orthopsychiatry, 57, 296-302.
- Harris, M., & Bergman, H. (1988). Clinical case management for
the chronically mentally ill: A conceptual analysis. In M.
Harris & L. Bachrach (Eds.), Clinical case management. San
Francisco: Jossey-Bass.
- Herinckx, H., Kinney, R., Clarke, G., & Paulson, R. (1997).
Assertive community treatment versus usual care in engaging
and retaining clients with severe mental illness.
Psychiatric Services, 48, 1297-1306.
- Herrman, H., Hawthorne, G., & Thomas, R. (2002). Quality of life
assessment in people living with psychosis. Social
Psychiatry Psychiatric Epidemiology, 37, 510-518.
- Hogan, M. (2002). Spending too much on mental illness in all the
wrong places. Psychiatric Services, 53, 1251-1252.
- Hogan, T., Awad, A., & Eastwood, R. (1983). A self-report scale
predictive of drug compliance in schizophrenics:
Reliability and discriminative validity. Psychological
Medicine, 13, 177-183.

- Hollingsworth, E., & Sweeney, J. (1997). Mental health expenditures for services for people with severe mental illnesses. *Psychiatric Services*, 48, 484-490.
- Holloway, F., & Carson, J. (2002). Quality of life in severe mental illness. *International Review of Psychiatry*, 14, 175-184.
- Holloway, F., & Carson, J. (2001). Case management: An update. *International Journal of Social Psychiatry*, 47, 21-31.
- Holloway, F., Oliver, N., Collins, E., & Carson, J. (1995). Case management: A critical review of the outcome literature. *European Psychiatry*, 10, 113-128.
- Hornstra, R., Bruce-Wolfe, V., Sagduyu, K., & Riffle, D. (1993). The effect of intensive case management on hospitalization of patients with schizophrenia. *Hospital and Community Psychiatry*, 44, 844-847.
- Horvath, A., & Greenberg, L. (1989). Development and validation of the Working Alliance Inventory. *Journal of Counseling Psychology*, 36(2), 223-233.
- Hoult, J., Reynolds, I., & Charbonneau-Powis, M. (1983). Psychiatric hospital versus community treatment: The results of a randomized trial. *Australian and New Zealand Journal of Psychiatry*, 17, 160-167.
- Howego, I., Yellowlees, P., Owen, C., Meldrum, L., & Dark, F. (2003). The therapeutic alliance: The key to effective patient outcome? A descriptive review of the evidence in community mental health case management. *Australian and New Zealand Journal of Psychiatry*, 37, 169-183.

- Hunt, M. (1997). How science takes stock: The story of meta-analysis. New York: Russell Sage Foundation.
- Huxley, P., Evans, S., Burns, T., Fahy, T., & Green, J. (2001). Quality of life outcome in a randomized controlled trial of case management. *Social Psychiatry Psychiatric Epidemiology*, 36, 249-255.
- Intagliata, J. (1982). Improving the quality of community care for the chronically mentally disabled: The role of case management. *Schizophrenia Bulletin*, 8, 655-674.
- Jerrell, J. (1999). Skill, symptom, and satisfaction changes in three service models for people with psychiatric disability. *Psychiatric Rehabilitation Journal*, 22, 342-348.
- Jerrell, J., & Hu, T. (1989). Cost-effectiveness of intensive clinical and case management compared with an existing system of care. *Inquiry*, 26, 224-234.
- Johnsen, M., Samberg, L., Calsyn, R., Blasinsky, M., Landow, W., & Goldman, H. (1999). Case management models for persons who are homeless and mentally ill: The ACCESS Demonstration Project. *Community Mental Health Journal*, 35, 325-346.
- Kane, J. (1985). Compliance issues in outpatient treatment. *Journal of Clinical Psychopharmacology*, 5, 22-27.
- Kanter, J. (1989). Clinical case management: Definition, principles, components. *Hospital and Community Psychiatry*, 40(4), 361-369.
- Kessler, R., Barker, P., Colpe, L., Epstein, J., Gfroerer, J., Hiripi, E., Howes, M., Normand, S., Manderscheid, R., Walters, E., & Zaslavsky, A. (2003). Screening for serious

- mental illness in the general population. *Archives of General Psychiatry*, 60, 184-189.
- Khatri, N., Romney, D., & Pelletier, G. (2001). Validity of self-reports about quality of life among patients with schizophrenia. *Psychiatric Services*, 52, 534-535.
- Kuno, E., Rothbard, A., & Sands, R. (1999). Service components of case management which reduce inpatient care use for persons with serious mental illness. *Community Mental Health Journal*, 35, 153-167.
- Lachance, K., & Santos, A. (1995). Modifying the PACT model: Preserving critical elements. *Psychiatric Services*, 46, 601-604.
- Lamb, H. (1980). Therapist-case managers: More than brokers of services. *Hospital and Community Psychiatry*, 33, 762-764.
- Lamb, H., & Bachrach, L. (2001). Some perspectives on deinstitutionalization. *Psychiatric Services*, 52, 1039-1045.
- Lamb, H., & Weinberger, L. (1998). Persons with severe mental illness in jails and prisons: A review. *Psychiatric Services*, 49, 483-492.
- Lang, M., Davidson, L., Bailey, P., & Levine, M. (1999). Clinicians' and clients' perspectives on the impact of assertive community treatment. *Psychiatric Services*, 50, 1331-1340.
- Larsen, D., Attkisson, C., Hargreaves, W., & Nguyen, T. (1979). Assessment of client/patient satisfaction: Development of a general scale. *Evaluation and Program Planning*, 2, 197-207.
- Barry, K., Zeber, J. Blow, F., & Valenstein, M. (2003). Effect of

- strength model versus assertive community treatment model on participant outcomes and utilization: Two-year follow-up. *Psychiatric Rehabilitation Journal*, 26, 268-277.
- Leff, S., & Mulkern, V. (2002). Lessons learned about science and participation in multisite evaluations. *New Directions for Evaluation*, 94, 89-100.
- Lehman, A. (1988). A quality of life interview for the mentally ill. *Evaluation and Program Planning*, 11, 51-62.
- Lehman, A. (1998). Public health policy, community services, and outcomes for patients with schizophrenia. *The Psychiatric Clinics of North America*, 21, 221-231.
- Lehman, A., Carpenter, W., Goldman, H., & Steinwachs, D. (1995). Treatment outcomes in schizophrenia: Implications for practice, policy, and research. *Schizophrenia Bulletin*, 21, 669-673.
- Lehman, A., Dixon, L., Kernan, E., DeForge, B., & Postrado, L. (1997). A randomized trial of Assertive community treatment for homeless persons with severe mental illness. *Archives of General Psychiatry*, 54, 1038-1042.
- Lehman, A. & Steinwachs, D. (1998). At issue: Translating research into practice: The Schizophrenia Patient Outcomes Research Team (PORT) treatment recommendations. *Schizophrenia Bulletin*, 24, 1-10.
- Lehman, A., Thompson, J., Dixon, L., & Scott, J. (1995). Schizophrenia: Treatment outcomes research - editors' introduction. *Schizophrenia Bulletin*, 21, 561-566.
- Liberman, R., & Kopelowicz, A. (2002). Recovery from

- schizophrenia: A challenge for the 21st century.
International Review of Psychiatry, 14, 245-255.
- Liberman, R., & Moss, G. (1994). Psychosocial treatments of
choice for major mental disorders. Psychiatry, 57, 100-114.
- Lin, C. (2003). Ethical exploration of the least restrict
alternative. Psychiatric Services, 54, 866-870.
- Lipsey, M. (1990). Design sensitivity: Statistical power for
experimental research. Newbury Park, CA: Sage Publications.
- Lipsey, M. (1993). Theory as method: Small theories of
treatments. In L. Sechrest & A. Scott (Eds.), Understanding
causes and generalizing about them. San Francisco: Jossey-
Bass.
- Lustig, D., Strauser, D., Rice, N., & Rucker, T. (2002). The
relationship between working alliance and rehabilitation
outcomes. Rehabilitation Counseling Bulletin, 46, 25-33.
- Manchanda, R., Hirsch, S., & Barnes, T. (1989). A review of
rating scales for measuring symptom changes in schizophrenia
research. In C. Thompson (Ed.), The instruments of
psychiatric research. New York: John Wiley & Sons.
- Mark, M. (2002). Toward an integrative view of the theory and
practice of program and policy evaluation. In S. Donaldson &
M. Scriven (Eds.), Evaluating social programs and problems:
Visions for the new millennium. Mahwah, NJ: Lawrence Erlbaum
Associates.
- Marshall, M. (1996). Case management: A dubious practice. British
Medical Journal, 312, 523-524.
- Marshall, M. & Creed, F. (2000). Assertive community treatment -

- Is it the future of community care in the UK. *International Review of Psychiatry* 12, 191-196.
- Marshall, M., Gray, A., Lockwood, A., & Green, R. (1998). Case management for people with severe mental disorders. Oxford, England: The Cochrane Library.
- Marshall, M., & Lockwood, A. (1998). Assertive community treatment for people with severe mental disorders. Oxford, England: The Cochrane Library.
- Marx, A., Test, M., & Stein, L. (1973). Extrohospital management of severe mental illness. *Archives of General Psychiatry*, 29, 505-511.
- McCabe, R., & Priebe, S. (2003). Are therapeutic relationship in psychiatry explained by patients' symptoms? Factors influencing patient ratings. *European Psychiatry*, 18, 220-225.
- McGrew, J., & Bond, G. (1995). Critical ingredients of assertive community treatment: Judgments of the experts. *Journal of Mental Health Administration*, 22, 113-125.
- McGrew, J., & Bond, G. (1997). The association between program characteristics and service delivery in assertive community treatment. *Administration and Policy in Mental Health*, 25, 175-189.
- McGrew, J., Bond, G., Dietzen, L., McKasson, M., & Miller, L. (1995). A multisite study of client outcomes in assertive community treatment. *Psychiatric Services*, 46, 696-701.
- McGrew, J., Bond, G., Dietzen, L., & Salyers, M. (1994).

- Measuring the fidelity of implementation of a mental health program model. *Journal of Consulting and Clinical Psychology*, 62(4), 670-678.
- McGrew, J., Wilson, R., & Bond, G (1996). Client perspectives on helpful ingredients of assertive community treatment. *Psychiatric Rehabilitation Journal*, 19(3), 13-21.
- McHugo, G., Drake, R., Teague, G., & Xie, H.(1999). Fidelity to assertive community treatment and client outcomes in the New Hampshire Dual Disorders Study. *Psychiatric Services*, 50, 818-824.
- McRae, J., Higgins, M., Lycan, C., & Sherman, W. (1990). What happens to patients after five years of intensive case management stops? *Hospital and Community Psychiatry*, 41, 175-179.
- Mechanic, D. (2003). Policy challenges in improving mental health services: Some lessons from the past. *Psychiatric Services*, 54, 1227-1232.
- Mechanic, D. (1991). Strategies for integrating public mental health services. *Hospital and Community Psychiatry*, 42, 797-801.
- Mechanic, D. (1999). *Mental health and social policy*. Needham Heights, MA: Allyn & Bacon.
- Mental Health Policy Resource Center (1988). *A typology for mental health case management for persons with severe mental illness*. Washington, DC: Mental Health Policy Resource Center.
- Milner, K., & Valenstein, M. (2002). *A comparison of guidelines*

- for the treatment of schizophrenia. *Psychiatric Services*, 53, 888-890.
- Minghella, E., Gauntlett, N., & Ford, R. (2002). Assertive outreach: Does it reach expectations? *Journal of Mental Health*, 11, 27-42.
- Moore, S. (1990). A social work practice model of case management: The case management grid. *Social Work*, 35, 444-448.
- Mowbray, C., Cohen, E., & Bybee, D. (1991). Services to individuals who are homeless and mentally ill: Implementation evaluation. In D. Rog (Ed.), *Evaluating programs for the homeless*. San Francisco: Jossey-Bass.
- Mowbray, C., Collins, M., Plum, T., Masterton, T., & Mulder, R. (1997). Harbinger I: The development and evaluation of the first PACT replication. *Administration and Policy in Mental Health*, 25, 105-123.
- Mueser, K., & Berenbaum, H. (1990). Psychodynamic treatment of schizophrenia: Is there a future? *Psychological Medicine*, 20, 253-262.
- Mueser, K., Bond, G., Drake, R., & Resnick, S. (1998). Models of community care for severe mental illness: A review of research on case management. *Schizophrenia Bulletin*, 24, 37-74.
- Mueser, K., Corrigan, P., Hilton, D., Tanzman, B., Schaub, A., Gingerich, S., Essock, S., Tarrier, N., Morey, B., Vogel-Scibilia, S., & Herz, M. (2002). Illness management and

- recovery: A review of the research. *Psychiatric Services*, 53, 1272-1284.
- Muijen, M., Marks, I., Connolly, J., & Audini, B. (1992). Home based care and standard hospital care for patients with severe mental illness: A randomised controlled trial. *British Medical Journal*, 304, 749-754.
- Murray, C., & Lopez, A. The global burden of disease: A comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020. Boston, MA: Harvard University Press, 1996.
- Myers, R. (1990). Classical and modern regression with applications (2nd Ed). Boston: Duxbury Press.
- Narrow, W., Rae, D., Robins, L., & Regier, D. (2002). Revised prevalence estimates of mental disorders in the United States. *Archives of General Psychiatry*, 59, 115-123.
- Neale, M., & Rosenheck, R. (1995). Therapeutic alliance and outcome in a VA intensive case management program. *Psychiatric Services*, 46, 719-721.
- Neligh, G., & Kinzie, J. (1983). Therapeutic relationships with the chronic patient. In D. Cutler (Ed.), *Effective aftercare for the 1980s*. San Francisco: Jossey-Bass.
- News & Notes (1999). President Clinton announces an array of initiatives at First White House Conference on Mental Health. *Psychiatric Services*, 50, 980-981.
- Nguyen, T., Attkisson, C., & Stegner, B. (1983). Assessment of

- patient satisfaction: Development and refinement of a service satisfaction questionnaire. *Evaluation and Program Planning*, 6, 299-313.
- Nicholson, I., & Neufeld, R. (1992). A dynamic vulnerability perspective on stress and schizophrenia. *American Journal of Orthopsychiatry*, 62(1), 117-130.
- Nieves, E. (2002). The effectiveness of the assertive community treatment model. *Administration and Policy in Mental Health*, 29, 461-480.
- Norusis, M. (1994). *SPSS Advanced Statistics 6.1* Chicago: SPSS, Inc.
- Norusis, M. (1994). *SPSS Professional Statistics 6.1*. Chicago: SPSS, Inc.
- Norusis, M. (1993). *SPSS for Windows Base System User's Guide Release 6.0*. Chicago: SPSS, Inc.
- O'Leary, D. (1988). The need for clinical standards of care. *Quality Review Bulletin*, 14, 31-32.
- Olfson, M. (1990). Assertive community treatment: An evaluation of the experimental evidence. *Hospital and Community Psychiatry*, 41, 634-641.
- Overall, J., & Gorham, D. (1962). The Brief Psychiatric Rating Scale. *Psychological Reports*, 10, 799-812,
- Penn, D., & Mueser, K. (1996). Research update on the psychosocial treatment of schizophrenia. *American Journal of Psychiatry*, 153, 607-617.
- Peterson, K., & Bickman, L. (1992). Using program theory in

- quality assessments of children's mental health services. In H. Chen & P. Rossi (Eds.), *Using theory to improve program and policy evaluations*. New York: Greenwood Press.
- Phillips, S., Burns, B., Edgar, E., Mueser, K., Linkins, K., Rosenheck, R., Drake, R., & Herr, E. (2001). Moving assertive community treatment into standard practice. *Psychiatric Services*, 52, 771-779.
- President's New Freedom Commission on Mental Health (2003). *Achieving the promise: Transforming mental health care in America*. Rockville, MD: U.S. Government Printing Office.
- Preston, N., & Fazio, S. (2000). Establishing the efficacy and cost effectiveness of community intensive case management of long-term mentally ill: A matched control group study. *Australian and New Zealand Journal of Psychiatry*, 34, 114-121.
- Prince, P., & Prince, C. (2001). Subjective quality of life in the evaluation of programs for people with serious and persistent mental illness. *Clinical Psychology Review*, 21, 1005-1036.
- Quinlivan, R., Hough, R., Crowell, A., Beach, C., Hofstetter, R., & Kenworthy, K. (1995). Service utilization and costs of care for severely mentally ill clients in an intensive case management program. *Psychiatric Services*, 46, 365-371.
- Randolph, F., Blasinsky, M., Morrissey, J., Rosenheck, R., Cocozza, J., & Goldman, H. (2002). Overview of the ACCESS Program. *Psychiatric Services*, 53, 945-948.
- Rapp, C. (1998). The active ingredients of effective case

- management: A research synthesis. *Community Mental Health Journal*, 34, 363-380.
- Redko, C., Durbin, J., Wasylenki, D., & Krupa, T. (2004). Participant perspectives on satisfaction with assertive community treatment. *Psychiatric Rehabilitation Journal*, 27, 283-286.
- Reynolds, A. (1998). Confirmatory program evaluation: A method for strengthening causal inference. *American Journal of Evaluation*, 19, 203-222.
- Ridgely, M., & Willenbring, M. (1992). Application of case management to drug abuse treatment: Overview of models and research issues. In R. Ashery (Ed.), *Progress and issues in case management*. Rockville, MD: U. S. Department of Health and Human Services.
- Roberts, R., Pascoe, G., & Attkisson, C. (1983). Relationship between service satisfaction to life satisfaction and perceived well-being. *Evaluation and Program Planning*, 6, 373-383.
- Rosen, A., & Teesson, M. (2001). Does case management work? The evidence and the abuse of evidence-based medicine. *Australian and New Zealand Journal of Psychiatry*, 35, 731-746.
- Rosenfield, S. (1997). Labeling mental illness: The effects of received services and perceived stigma on life satisfaction. *American Sociological Review*, 62, 660-673.
- Rosenheck, R., Lam, J., Morrissey, J., Calloway, M., Stolar, M.,

- & Randolph, F. (2002). Services systems integration and outcomes for mentally ill homeless persons in the ACCESS Program. *Psychiatric Services*, 53, 958-966.
- Rossi, P., & Freeman, H. (1992). *Evaluation: A systematic approach*. Beverly Hills, CA: Sage Publications.
- Rothbard, A., Kuno, E., Schinnar, A., Hadley, T., & Turk, R. (1999). Service utilization and cost of community care for discharged state hospital patients: A 3-year follow-up study. *American Journal of Psychiatry*, 156, 920-927.
- Rubinbach, A. (1992). Is case management effective for people with serious mental illness? A research review. *Health & Social Work*, 17, 138-150.
- Rupp, A., & Keith, S. (1993). The costs of schizophrenia. In P. Powchik & S. Schulz (Eds.), *The Psychiatric Clinics of North America*. Vol. 16, pp. 413-423. Philadelphia: W. B. Saunders.
- Rutman, L. (1977). *Evaluation research methods: A basic guide*. Beverly Hills, CA: Sage.
- Ryan, C., Sherman, P., & Bogart, L. (1997). Patterns of services and consumer outcome in an intensive case management program. *Journal of Consulting and Clinical Psychology*, 65, 485-493.
- Ryan, C., Sherman, P., & Judd, C. (1994). Accounting for case manager effects in the evaluation of mental health services. *Journal of Consulting and Clinical Psychology*, 62, 965-974.
- Salyers, M., Bond, G., Teague, G., Cox, J., Smith, M., Hicks, M., & Koop, J. (2003). Is it ACT yet? Real-world examples of

- evaluating the degree of implementation for assertive community treatment. *The Journal of Behavioral Health Services & Research*, 30, 304-320.
- Santos, A. (1997). Guest editor's introduction - ACT now! *Administration and Policy in Mental Health*, 25, 101-104.
- Schaedle, R., McGrew, J., Bond, G., & Epstein, I. (2002). A comparison of experts' perspectives on assertive community treatment and intensive case management. *Psychiatric Services*, 53, 207-210.
- Schnapp, W., Bayles, S., Raffoul, P., & Schnee, S. (1999). Privatization and the rise and fall of the public mental health safety net. *Administration and Policy in Mental Health*, 26, 221-225.
- Schoenwald, S., & Hoagwood, K. (2001). Effectiveness, transportability, and dissemination of interventions: What matters when? *Psychiatric Services*, 52, 1190-1197.
- Scott, A., & Sechrest, L. (1989). Strength of theory and theory of strength. *Evaluation and Program Planning*, 12, 329-336.
- Scott, J., & Dixon, L. (1995). Assertive community treatment and case management for schizophrenia. *Schizophrenia Bulletin*, 21, 657-668.
- Sechrest, L., & Sidani, S. (1995). Quantitative and qualitative methods: Is there an alternative? *Evaluation and Program Planning*, 18(1), 77-87.
- Sharfstein, S. (2000). Whatever happened to community mental health? *Psychiatric Services*, 51, 616-620.
- Sherman, P., & Ryan, C. (1998). Intensity and duration of

- intensive case management services. *Psychiatric Services*, 49, 1585-1589.
- Shern, D., Surles, R., & Waizer, J. (1989). Designing community treatment systems for the most seriously mentally ill: A state administrative perspective. *Journal of Social Issues*, 45, 105-117.
- Simpson, A., Miller, C., & Bowers, L. (2003). Case management models and the care programme approach: How to make CPA effective and credible. *Journal of Psychiatric and Mental Health Nursing*, 10, 472-483.
- Solomon, P. (1992). The efficacy of case management services for severely mentally disabled clients. *Community Mental Health Journal*, 28, 163-184.
- Solomon, P., Draine, J., & Delaney, M. (1995). The working alliance and consumer case management. *The Journal of Mental Health Administration*, 22, 126-146.
- Stein, L. (1992). On the abolishment of the case manager. *Health Affairs*, 11, 172-177.
- Stein, L., & Test, M. (1980). Alternative to mental hospital treatment: Conceptual model, treatment program, and clinical evaluation. *Archives of General Psychiatry*, 37, 392-397.
- Stein, L., Test, M., & Marx, A. (1975). Alternative to the hospital: A controlled study. *American Journal of Psychiatry*, 132(5), 517-521.
- Stevens, J. (1992). *Applied multivariate statistics for the social sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Streicker, S., Amdur, M., & Dincin, J. (1986). Educating patients

about psychiatric medications: Failure to enhance compliance. *Psychosocial Rehabilitation Journal*, 9, 15-28.

Sullivan, W. (1992). Reclaiming the community: The strengths perspective and deinstitutionalization. *Social Work*, 37, 204-209.

Surles, R., Blanch, A., Shern, D., & Donahue, S. Case management as a strategy for systems change. *Health Affairs*, 11, 151-163.

Surles, R. & McGurkin, M. (1987). Increased use of psychiatric emergency services by young chronic mentally ill patients. *Hospital and Community Psychiatry*, 38, 401-405.

Stylianos, S., & Goering, P. (1989). The working alliance inventory: Reliability and validity in the context of rehabilitative interventions for psychotic clients. Unpublished manuscript.

Talbott, J. (2000). The past and future of mental health services: An interview with Leona Bachrach. *Psychiatric Services*, 51, 1511-1512.

Taube, C., Morlock, L., Burns, B., & Santos, A. (1990). New directions in research on assertive community treatment. *Hospital and Community Psychiatry*, 41(6), 642-649.

Teague, G., Bond, G., & Drake, R. (1998). Program fidelity in assertive community treatment: Development and use of a measure. *American Journal of Orthopsychiatry*, 68, 216-232.

Teague, G., Drake, R., & Ackerson, T. (1995). Evaluating use of continuous treatment teams for persons with mental illness and substance abuse. *Psychiatric Services*, 46, 689-695.

- Tempier, R., & Pawliuk, N. (2001). Influence of novel and conventional antipsychotic medication on subjective quality of life. *Journal of Psychiatry & Neuroscience*, 26, 131-137.
- Test, M. (1992). Training in community living. In R. Liberman (Ed.), *Handbook of psychiatric rehabilitation*. New York: Macmillan Publishing.
- Test, M., Knoedler, W., & Allness, D. (1985). The long-term treatment of young schizophrenics in a community support program. In L. Stein & M. Test (Eds.), *The training in community living model: A decade of experience: New directions in mental health services*. San Francisco: Jossey-Bass.
- Test, M., & Stein, L. (1980). Alternative to mental hospital treatment: Social cost. *Archives of General Psychiatry*, 37, 409-412.
- Thompson, M. (1980). *Benefit-cost analysis for program evaluation*. Beverly Hills: Sage.
- Thornicroft, G. (2000). Testing and retesting assertive community treatment. *Psychiatric Services*, 51, 703.
- Thornicroft, G., Becker, T., Holloway, F., Johnson, S., Leese, M., McCrone, P., Szmukler, G., Taylor, R., & Wykes, T. (1999). Community mental health teams: Evidence or belief? *The British Journal of Psychiatry*, 175, 508-513.
- Thornicroft, G., Strathdee, G., Phelan, M., Holloway, F., Wykes, T., Dunn, G., McCrone, P., Leese, M., Johnson, S., & Szmukler, G. (1998). Rationale and design. *PriSM Psychosis Study 1*. *The British Journal of Psychiatry*, 173, 363-370.

- Torrey, E. (1999). The cost of not treating serious mental illness. *Psychiatric Services*, 50, 1087.
- Tracey, T., & Kokotovic, A. (1989). Factor structure of the Working Alliance Inventory. *Psychological Assessment*, 1(3), 207-210.
- Tyler, L. (1997). The effect of case management approach on outcomes: A multi-dimensional evaluation of services for individuals with serious mental illness. Unpublished doctoral dissertation, Virginia Commonwealth University, Richmond.
- Tyrer, P. (2000). Are small caseloads beautiful in severe mental illness? *The British Journal of Psychiatry*, 177, 386-387.
- United States Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion (1999). About chronic disease: Definition, overall burden, and cost effectiveness of prevention. www.cdc.gov/nccphp/about.htm.
- United States Public Health Service Office of the Surgeon General (1999). Mental health: A report of the Surgeon General. Rockville, MD: Department of Health and Human Services, U.S. Public Health Service.
- Vandiver, V. (1997). Services to the severely and persistently mentally ill. In T. Watkins & J. Callicutt (Eds.), *Mental health policy and practice today*. Thousand Oaks, CA: Sage Publications.
- Wang, P., Demier, O., & Kessler, R. (2002). Adequacy of treatment

- for serious mental illness in the United States. *American Journal of Public Health*, 92, 92-98.
- Wasylenki, D., Goering, P., Cochrane, J., Durbin, J., Rogers, J., & Prendergast, P. (2000). Tertiary mental health services: Key concepts. *Canadian Journal of Psychiatry*, 45, 179-184.
- Wasylenki, D., Goering, P., Lancee, W., Ballantyne, R., & Farkas, M. (1985). Impact of a case manager program on psychiatric aftercare. *The Journal of Nervous and Mental Disease*, 173, 303-308.
- Weick, A., Rapp, C., Sullivan, W., & Kisthardt, W. (1989). A strengths perspective for social work practice. *Social Work*, 34, 350-354.
- Weil, M., & Karls, J. (1985). Case management in human service practice. San Francisco: Jossey-Bass.
- Weisbrod, B., Test, M., & Leonard, L. (1980). Alternative to mental hospital treatment: Economic benefit-cost analysis. *Archives of General Psychiatry*, 37, 400-405.
- Welham, J., Haire, M., Mercer, D., & Stedman, T. (2001). A gap approach to exploring quality of life in mental health. *Quality of Life Research*, 10, 421-429.
- Wholey, J. (1987). Evaluability assessment: Developing program theory. In L. Bickman (Ed.), *Using program theory in evaluation*. San Francisco: Jossey-Bass, Inc.
- Willenbring, M. (1992). Integrating qualitative and quantitative components in evaluation of case management. In R. Ashery (Ed.), *Progress and issues in case management*. Rockville, MD: U. S. Department of Health and Human Services.

- Wood, M. (1993). Using practitioners' theories to document program results. *Nonprofit Management and Leadership*, 4(1), 85-106.
- Worthen, B. (1996). Editor's note: The origins of theory-based evaluation. *Evaluation Practice*, 17, 169-171.
- Wykes, T., & Holloway, F. (2000). Community rehabilitation: Past failures and future prospects. *International Review of Psychiatry*, 12, 197-205.
- Yank, G., Bentley, K., & Hargrove, D. (1993). The vulnerability model of schizophrenia: Advances in psychosocial treatment. *American Journal of Orthopsychiatry*, 63,(1), 55-69.
- Ziguras, S., & Stuart, G. (2000). A meta-analysis of the effectiveness of case management over 20 years. *Psychiatric Services*, 51, 1410-1421.
- Zubin, J., & Spring, B. (1977). Vulnerability - A new view of schizophrenia. *Journal of Abnormal Psychology*, 86, 103-126.
- Zubin, J., Steinhauer, S., & Condray, R. (1992). Vulnerability to relapse in schizophrenia. *British Journal of Psychiatry*, 161, 13-18.
- Zygmunt, A., Olfson, M., Boyer, C., & Mechanic, D. (2002). Interventions to improve medication adherence in schizophrenia. *American Journal of Psychiatry*, 159, 1653-1664.

APPENDIX A

QUALITY OF LIFE INTERVIEWS

AND

SATISFACTION WITH SERVICES QUESTIONNAIRES

PART I - LIFE SITUATION QUESTIONNAIRE

INTRODUCTION

I am interested in what your life is like, your health, and how you feel about the services you have been receiving. There are no right or wrong answers, so please relax and take your time in answering. Before we start, do you have any questions?

SECTION A: **LIVING SITUATION**

First, I am going to ask you some questions about your living situation.

1. What is your current living situation? _____ *

* IF CONSUMER IS CURRENTLY IN HOSPITAL/INPATIENT FACILITY, ALSO
INDICATE LIVING SITUATION JUST PRIOR TO HOSPITALIZATION.

- 01 Homeless
- 02 Jail
- 03 Psychiatric hospital/inpatient facility
- 04 DCSB Motel (Respite)
- 05 DCSB Diversion Apartments
- 06 Other Emergency/Respite Shelter
- 07 Intermediate care facility or nursing home
- 08 Adult Foster Care (Protective Services)
- 09 Lives with relatives (mostly dependent for personal care and control)
- 10 Group home/Long term supervised group living
- 11 Halfway house/Transitional group home
- 12 Boarding house/Personal Care home (No program/supervision)
- 13 Personal care home with program/supervision
- 14 Lives with relatives (mostly independent)
- 15 Supervised apartment program
- 16 Shares apartment and capable of self-care
- 17 Lives alone or with spouse and capable of self-care (private house/apartment)
- 18 Other (specify) _____

SATISFACTION WITH SERVICES AND QUALITY OF LIFE INTERVIEW (Part I, page 1 of 10) Developed by A. Lehman: Quality of Life Interview DeKalb Community Service Board	Consumer's Name _____
	Account Number _____
	Completed by: _____
	Date: _____

DCSB 5/1/95

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- a. _____
- b. _____
- c. _____
- d. _____
- e. _____
- f. _____
- g. _____
- h. _____

- _____

a. outside without shelter	1	2	3	4	9
b. inside an empty building	1	2	3	4	9
c. in a public shelter	1	2	3	4	9
d. in a church	1	2	3	4	9

(Don't know/Refused ... 9)

- | | | | | | | | | | |
|--------------|-----|---|---|----|---|---|----|---|---|
| the average? | Yes | - | 1 | No | - | 0 | NK | - | 9 |
|--------------|-----|---|---|----|---|---|----|---|---|

SECTION B. **FINANCES**

A few questions about money.

1. In the past, have you had any financial support from the following sources?

	Codes:	Not Known	Yes	
No		(9)	(1)	(0)
_____ 1.	Earned income			
_____ 2.	Social Security Benefits (SSA)			
_____ 3.	Social Security Disability Income (SSDI)			
_____ 4.	Supplemental Security Income (SSI)			
_____ 5.	Armed Service connected disability payments			
_____ 6.	Other Social Welfare benefits--state or county (general welfare, Aid to Families w/Dependent Children [AFDC])			
_____ 7.	Vocational program (Comprehensive Employment and Training Act (CETA), Vocational Rehabili- tation, sheltered workshop, Goodwill,			
_____ 8.	Unemployment compensation			
_____ 9.	Retirement, investment or savings income			
_____ 10.	Rent supplements (including HUD, Section 8 certificates, living programs receiving public support)			
_____ 11.	Alimony and child support			
_____ 12.	Food stamps			
_____ 13.	Family and/or spouse contribution			
_____ 14.	Other source(s) - SPECIFY: _____			

2. How much money did you receive during the past month from all of these sources?

\$ _____ .00 9999 - NK, RF

2A. Was this a usual month in terms of the amount of money you received?
1 - Yes (Go to Q3) 0 - No (Go to Q2B) 9 - NK,RF (Go to Q2B)

2B. Would you say that the amount of money you receive during the past
month was more than or less than usual?

2C. How much would you say that you have usually received per month
during the past year?

\$ _____ .00 9999 - NK,RF

SECTION C. WORK AND SCHOOL

1. Have you worked during the last year, that is since _____? **Are you working now?**

No (Q13) **0**
Yes, currently **1**
Yes, formerly (Q6) **2**
RF **7**
NK **8**

PROBE FOR ANY PAID WORK

2. What kind of work do you do at the present time?

Vocational Status Code: _____

01 No vocational activity
02 Day Habilitation
03 Sheltered employment
04 Specialized employment/Work activity
05 TEP
06 Supported Employment/Job Coach
07 Attending vocational school or training
08 Attending basic education or GED classes
09 Active search for employment
10 Homemaker caring for children or others
11 Competitive employment less than 30 hours per week
12 Competitive employment more than 30 hours per week
13 Other (specify): _____
97 Refused
98 Not Known

3. About how many hours a week do you usually work? _____

RF 97
NK 98
NA 99

4. About how much do you earn per week at this job? \$: _____

\$996 996
RF 997
NK 998
NA 999

ROUND TO DOLLARS

5. Is this the only job you have had in the past year, that is since _____?

No (Q7) 1
Yes (Q14) 2
RF 7
NK 8
NA 9

6. You said you were not working at present, but have worked in the past year. How many weeks has it been since you worked?

Weeks: _____
RF 997
NK 998
NA 999

7. Please describe each job that you've had in the past year, that is since _____ other than the one we've talked about. What was the job you had before the job at which you currently work?

Vocational Status Code _____ (Use same codes as Item #2 above.)

8. About how many hours a week did you usually work? _____
- | | |
|----------|----|
| RF | 97 |
| NK | 98 |
| NA | 99 |

9. About how much did you earn per week at this job? \$ _____
- | | |
|---------------------------|-----|
| \$996+ | 996 |
| RF | 997 |
| NK | 998 |
| ROUND TO DOLLARS NA | 999 |

10. If S claims no work at all during the past year, ask: Why are you not working at this time?

PROBE: PSYCHIATRIC PROBLEMS
 PHYSICAL PROBLEMS
 LAID OFF
 LOOKING, (CAN'T FIND, ETC.)

WHAT IS THE MAIN REASON? _____

RF	7
NK	8
NA	9

11. During the past year, that is since _____ have you done any type of work such as yard work or painting over a few days time that you got paid for?

No (Q16)	0
Yes	1
RF	7
NK	8
NA	9

12. If so, about how much did you earn doing this? \$ _____ .00

\$996+	996
RF	997
NK	998
NA	999

13. Have you done any kind of volunteer work such as working at a hospital or a school in the past year that is since _____ ?

No (Q18)	1
Yes	2
RF	7
NK	8

14. About how many hours per week do you do volunteer work? _____

RF	97
NK	98
NA	99

15. Have you done any other type of work in the past year?
- | | |
|-----|---|
| No | 1 |
| Yes | 2 |
| RF | 7 |
| NK | 8 |
16. About how much did you earn per week? \$ _____ .00
- | | |
|--------|-----|
| \$996+ | 996 |
| RF | 997 |
| NK | 998 |
| NA | 999 |

SECTION D: LEGAL AND SAFETY ISSUES

1. In the past year, have you been picked up or arrested for any of the following types of crimes (READ OPTIONS A-E)?
- | | NO | YES |
|-----------------------------|----|-----|
| A. Alcohol or drug offense? | 0 | 1 |
| B. Shoplifting? | 0 | 1 |
| C. Loitering? | 0 | 1 |
| D. Public nuisance? | 0 | 1 |
| E. Other crime (SPECIFY)? | 0 | 1 |
2. How many times have you been arrested or picked-up for any crimes in the past year?
ARRESTS _____
3. In the past year, how many nights did you spend in jail?
NIGHTS _____
4. In the past year, were you a victim of:
- A. Any violent crimes such as assault, rape, mugging, or robbery?
- | | |
|---------------------|---|
| No | 0 |
| Yes, once | 1 |
| Yes, more than once | 2 |
| RF | 7 |
| DK | 8 |
| NA | 9 |
- B. Any non-violent crimes such as burglary, theft of your property or money, or being cheated?
- | | |
|---------------------|---|
| No | 0 |
| Yes, once | 1 |
| Yes, more than once | 2 |
| RF | 7 |
| NK | 8 |
| NA | 9 |

SECTION E: HEALTH: MEDICAL OUTCOME STUDY QUESTIONNAIRE

NOW I'D LIKE TO ASK YOU ABOUT YOUR HEALTH.

1. In general, would you say your health is:

Excellent	1
Very Good	2
Good	3
Fair	4
Poor	5
RF	7
NK	8

2. Compared to six months ago, how would you rate your health in general now?

Much better now than six months ago	1
Somewhat better now than six months ago	2
About the same	3
Somewhat worse now than six months ago	4
Much worse now than six months ago	5
RF	7
NK	8

3. During the past four weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

	<u>Yes</u>	<u>No</u>	<u>RF</u>	<u>NK</u>
Cut down the <u>amount of time</u> you spent on work or other activities?	1	0	7	8
<u>Accomplished less</u> than you would like?	1	0	7	8
Were limited in the <u>kind</u> of work or other activities?	1	0	7	8
Had <u>difficulty</u> performing the work or other activities (for example, it took extra effort?)	1	0	7	8

4. During the past four weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

	<u>Yes</u>	<u>No</u>	<u>RF</u>	<u>NK</u>
Cut down the <u>amount of time</u> you spent on work or other activities?	1	0	7	8
<u>Accomplished less</u> than you would like?	1	0	7	8
Didn't do work or other activities as carefully as usual?	1	0	7	8

5. During the past four weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with your normal social activities with family, friends, neighbors, or groups?

Not at all 1
 Slightly 2
 Moderately 3
 Quite a bit 4
 Extremely 5
 RF 7
 NK 8

SECTION F: DAILY ACTIVITIES AND FUNCTIONING

1. Now let's talk about some of the things you did with your time in the past week. I'm going to read you a list of things people may do with their free time. For each of these, please tell me if you did it during the past week. Did you...(READ OPTIONS A-P)?

	No	Yes	RF	NK
A. Go for a walk?	0	1	7	8
B. Go to a movie or play?	0	1	7	8
C. Watch television?	0	1	7	8
D. Go shopping?	0	1	7	8
E. Go to a restaurant or coffee shop?	0	1	7	8
F. Go to a bar?	0	1	7	8
G. Read a book, magazine or newspaper?	0	1	7	8
H. Listen to a radio?	0	1	7	8
I. Play cards?	0	1	7	8
J. Go for a ride in a bus or car?	0	1	7	8
K. Prepare a meal?	0	1	7	8
L. Work on a hobby?	0	1	7	8
M. Play a sport?	0	1	7	8
N. Go to a meeting of some organization or social group (including program)?	0	1	7	8
O. Go to a park?	0	1	7	8
P. Go to a library?	0	1	7	8

2. Overall, how would you rate your functioning in home, social, school, and work settings at the present time? Would you say your functioning in these areas is excellent, good, fair or poor?

Excellent	1
Good	2
Fair	3
Poor	4
DK	5

SECTION G: SOCIAL RELATIONS

Now I'd like to know about other people in your life, that is, people who are not in your family.

1. Do you have any close friends who are not family members?

No	(go to 3)	0
Yes		1
RF	(go to 3)	7
NK	(go to 3)	8

- a. Do any of these friends live outside of your home?

No	0
Yes	1

2. In the past year, how often did you do things with any of these close friends? Would you say at least once a day, once a week, once a month, less than once a month, or not at all?

At least once a day	5
At least once a week	4
At least once a month	3
Less than once a month	2
Not at all	1
RF	7
NK	8

3. Still talking about friends, about how often do you do the following? Would you say, at least once a day, once a week, once a month, less than once a month or not at all?

At least once a day	5
At least once a week	4
At least once a month	3
Less than once a month	2
Not at all	1
RF	7
NK	8

- a. Visit with someone who does not live with you? _____
b. Telephone someone who does not live with you? _____
c. Write a letter to someone? _____
d. Do something with another person that you planned ahead of time? _____
e. Spend time with someone you consider more than a friend, like a boyfriend or girlfriend. _____

SECTION H: **FAMILY RELATIONS**

The next few questions are about your relationship with your family including any relatives with whom you live.

1. In the past year, how often did you talk to a member of your family on the telephone? Would you say at least once a day, at least once a week, at least once a month, less than once a month but at least once a year, or not at all?

At least once a day	5
At least once a week	4
At least once a month	3
Less than once a month	2
Not at all	1
No family (go to section E)	9
RF	7
NK	8

2. In the past year, how often did you get together with a member of your family? At least once a day, at least once a week, at least once a month, less than once a month but at least once, or not at all?

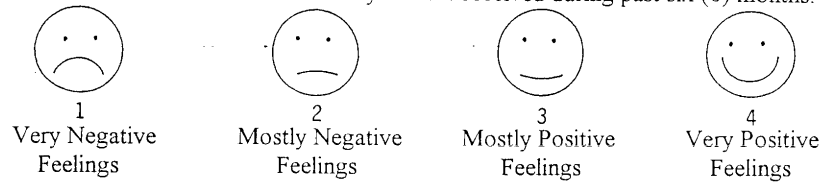
At least once a day	5
At least once a week	4
At least once a month	3
Less than once a month	2
Not at all	1
No family	9
RF	7
NK	8

1.



PART III - SATISFACTION WITH SERVICES

For the following 8 items, present the feelings scale to the consumer with the following instruction: Here is a scale indicating various feelings. Below each is a number. I am going to read you some questions about the mental health and social services you have received during past six (6) months.



Then read the consumer the 8 questions, noting his/her response in the blank at the side of each question. If the consumer has trouble understanding or responding to any particular question, first repeat the question verbatim. If the consumer is still having difficulty, paraphrase the question as closely as possible. If you cannot get a response from a consumer, mark "NO" in the blank and go on. Note: Consumers may begin discussing each question rather than answering it. If they do, break in gently but firmly and ask which face best expresses their feelings about that particular area of service satisfaction.

1. How would you rate the quality of services you have received? _____
2. Did you get the kind of help you wanted? _____
3. To what extent have the services met your needs? _____
4. If a friend were in need of similar help, would you recommend **our agency** to him or her? _____
5. How satisfied are you with the amount of help you have received? _____
6. Have the services you received helped you to deal more effectively with your problems? _____
7. In an overall, general sense, how satisfied are you with the service you have received? _____
8. You came to **our agency** with certain problems. How are these problems now? _____

SATISFACTION WITH SERVICES AND QUALITY OF LIFE INTERVIEW (Part III, page 1 of 1) Developed by Larsen, Atkinson, Hargreaves, and Nguyen: Consumer Satisfaction Questionnaire DeKalb Community Service Board, 05/3/95	Consumer's Name _____
	Account Number _____
	Completed By _____
	Date _____

PART IV

SATISFACTION WITH MEDICATIONS

Indicate how you feel about the medications which the psychiatrist has prescribed for you to use at the present time.

Circle your answer True or False (T or F):

- | | | |
|--|---|---|
| 1. For me, the good things about medications outweigh the bad. | T | F |
| 2. I feel weird, like a "zombie", on medications. | T | F |
| 3. I take medications of my own free choice. | T | F |
| 4. Medications make me feel more relaxed. | T | F |
| 5. Medications make me feel tired and sluggish. | T | F |
| 6. I take medications only when I am sick. | T | F |
| 7. I feel more normal on medications. | T | F |
| 8. It is unnatural for my mind and body to be controlled by medications. | T | F |
| 9. My thoughts are clearer on medications. | T | F |
| 10. By staying on medications, I can prevent getting sick. | T | F |

SATISFACTION WITH SERVICES AND QUALITY OF LIFE INTERVIEW (Part IV, page 1 of 1) Developed by A.G. Awad: DAL-10 DeKalb Community Service Board	Consumer's Name _____
	Account Number _____
	Completed By _____
	Date _____

DCSB 5/1/95

APPENDIX B

MENTAL STATUS EXAMINATION

AND

BRIEF PSYCHIATRIC RATING SCALE

	Not Assessed 0	Not Present 1	Very Mild 2	Mild 3	Moderate 4	Moderately Severe 5	Severe 6	Extremely Severe 7	SCORE
1. Somatic Concern	Degree of concern over present bodily health. Rate the degree to which physical health is perceived as a problem by the patient, whether complaints have a realistic basis or not.								
2. Anxiety	Worry, fear, or over-concern for present or future. Rate solely on the basis of verbal report of patient's own subjective experiences. Do not infer anxiety from physical signs or from neurotic defense mechanisms.								
3. Emotional Withdrawal	Deficiency in relating to the interviewer and to the interviewer situation. Rate only the degree to which the patient gives the impression of failing to be in emotional contact with other people in the interview situation.								
4. Conceptual Disorganization	Degree to which the thought processes are confused, disconnected or disorganized. Rate on the basis of integration of the verbal products of the patient; do not rate on the basis of patient's subjective impression of his own level of functioning.								
5. Guilt Feelings	Over-concern or remorse for past behavior. Rate on the basis of the patient's subjective experiences of guilt as evidenced by verbal report with appropriate affect; do not infer guilt feelings from depression, anxiety or neurotic defenses.								
6. Tension	Physical and motor manifestations of tension, "nervousness", and heightened activation level. Tension should be rated solely on the basis of physical signs and motor behavior and not on the basis of subjective experiences of tension reported by the patient.								
7. Mannerisms and Posturing	Unusual and unnatural motor behavior, the type of motor behavior which causes certain mental patients to stand out in a crowd of normal people. Rate only abnormality of movements; do not rate simple heightened motor activity here.								
8. Grandiosity	Exaggerated self-opinion, conviction of unusual ability or powers. Rate only on the basis of patient's statements about himself or self-in-relation-to-others, not on the basis if his demeanor in the interview situation.								
9. Depressive Mood	Despondency in mood, sadness. Rate only degree of despondency; do not rate on the basis of inferences concerning depression based upon general retardation and somatic complaints.								
10. Hostility	Animosity, contempt, belligerence, disdain for other people outside the interview situation. Rate solely on the basis of the verbal report of feelings and actions of the patient toward others; do not infer hostility from neurotic defenses, anxiety nor somatic complaints. (Rate attitude toward interviewer under "uncooperativeness".)								
11. Suspiciousness	Belief (delusional or otherwise) that others have now, or have had in the past, malicious or discriminatory intent toward the patient. On the basis of verbal report, rate only those suspicions which are currently held whether they concern past or present circumstances.								
MENTAL STATUS / DSM Developed by Overall and Gorham: BRIEF PSYCHIATRIC RATING SCALE (BPRS) Page 1 of 2 DeKalb Community Service Board						Consumer Name: Account Number:			

BPRS3195

Revised:3/1/95

Not Assessed 0	Not Present 1	Very Mild 2	Mild 3	Moderate 4	Moderately Severe 5	Severe 6	Extremely Severe 7	SCORE
12. Hallucinatory Behavior	Perceptions without normal external stimulus correspondence. Rate only those experiences which are reported to have occurred within the last week and which are described as distinctly difference from the thought and imagery processes of normal people.							
13. Motor Retardation	Reduction in the energy level evidenced in slowed movements. Rate on the basis of observed behavior of the patient only; do not rate on basis of patients subjective impression of own energy level							
14. Uncooperativeness	Evidence of resistance, unfriendliness, resentment, and lack of readiness to cooperate with the interviewer. Rate only on the basis of the patient's attitude and responses to the interviewer and the interview situation; do not rate on basis of reported resentment or uncooperativeness outside the interview situation.							
15. Unusual Thought Content	Unusual, odd, strange, or bizarre thought content. Rate here the degree of unusualness, not the degree of disorganization of thought processes.							
16. Blunted Affect	Reduced emotional tone, apparent lack of normal feeling or involvement.							
17. Excitement	Heightened emotional tone, agitation, increased reactivity.							
18. Disorientation	Confusion or lack of proper association for person, place, or time.							
T O T A L S C O R E								

SUICIDAL IDEATION, PLAN: ☐ NO ☐ YES..DESCRIBE HOMICIDAL IDEATION, PLAN: ☐ NO ☐ YES...

Describe: _____

SUBSTANCES (ALCOHOL/DRUGS/MEDS) USED IN LAST 7 DAYS: ☐ No ☐ YES, Complete Appropriate Addendums.

STATUS OF SA DISORDER: ☐ NA ☐ NO HISTORY ☐ ACTIVE DEPENDENCE/ABUSE

☐ EARLY FULL REMISSION ☐ EARLY PARTIAL REMISSION ☐ SUSTAINED FULL REMISSION

☐ SUSTAINED PARTIAL REMISSION ☐ AGONIST THERAPY ☐ NOW IN CONTROLLED ENVIRONMENT

DIAGNOSTIC IMPRESSION:

Axis I: _____

Axis II: _____

Axis III: _____

Axis IV: _____

Axis V: _____

Staff / Title / Date _____ / ____ / ____ Physician / Date _____ M.D. ____ / ____ / ____

<p>MENTAL STATUS / DSM Developed by Overall and Gorham: BRIEF PSYCHIATRIC RATING SCALE (BPRS) Page 2 of 2 DeKalb Community Service Board</p>	<p>Consumer Name: _____</p> <p>Account Number: _____</p>
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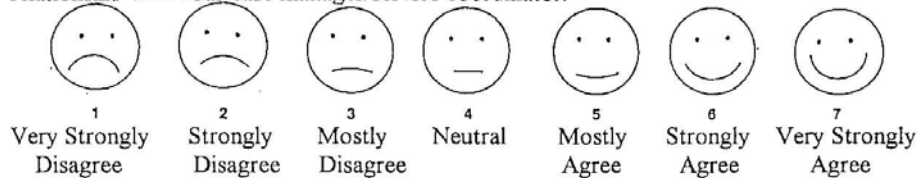
BPRS3195

Revised 3/1/95

APPENDIX C
WORKING RELATIONSHIP QUESTIONNAIRE

WORKING RELATIONSHIP QUESTIONNAIRE

For the following 12 items, present the feelings scale to the consumer with the following instruction: Here is a scale indicating various feelings. I am going to read you some questions about your relationship with your case manager/service coordinator.



Insert the name of the case manager/service coordinator in blanks. Then read the consumer the 12 statements, noting his/her response at the side of each statement. If the consumer has trouble understanding or responding to any particular statement, first repeat the statement verbatim. If the consumer is still having difficulty, paraphrase the statement as closely as possible. If you cannot get a response from a consumer, mark "No" in the blank and go on. Note: Consumers may begin discussing each question rather than answering it. If they do, break in gently but firmly and ask which face best expresses their feelings about that particular aspect of the working relationship.

1. _____ and I agree about the help I need to improve my situation _____
2. What I am doing in counseling gives me new ways of looking at my problem _____
3. I believe _____ likes me _____
4. _____ understands what I am trying to accomplish with the services I am using _____
5. I am confident in _____'s ability to help me _____
6. We are working on the same goals for improving my situation _____
7. I feel that _____ appreciates me _____
8. We agree on what is important for me to work on _____
9. _____ and I trust one another _____
10. _____ and I agree on what my problems are. _____
11. We have established a good understanding of the kind of changes that would be good for me _____
12. I believe the way we are working on my problems is correct _____

<p>WORKING RELATIONSHIP QUESTIONNAIRE Developed by A.O. Horvath; WAI-12 DeKalb Community Service Board 6/20/95</p>	<p>Consumer's Name _____ Account Number _____ Completed By _____ Date _____</p>
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APPENDIX D
CASE MANAGER/SERVICE COORDINATOR
OUTCOME EVALUATION FORM

7

**CASE MANAGER/SERVICE COORDINATOR
OUTCOME EVALUATION**

Date: _____

Consumer Name: _____ Staff Name: _____

Consumer's most important goals/needs* (1=highest priority):

Outcome Code**

- | | |
|----------|----------|
| 1. _____ | 1. _____ |
| 2. _____ | 2. _____ |
| 3. _____ | 3. _____ |
| 4. _____ | 4. _____ |

* Past and current goals/needs addressed by the case management/coordination services you have been providing.
This list may not/does not need to coincide with the current Individualized Service Plan.

**Outcome Codes: 1 = Most unfavorable outcome thought likely
2 = Less than expected level of success
3 = Expected level of success
4 = More than expected level of success
5 = Best anticipated level of success

Brief description of strategy for assisting consumer with each goal/need:

1. _____
2. _____
3. _____
4. _____

Using the scale below, rate service plan & medication compliance:

Taking medication as prescribed _____
Following the individualized service plan _____

Scale: 1 = Poor 2 = Fair 3 = Good 4 = Excellent

Using the scale below, indicate how often your service contacts addressed these problems,

needs or issues: Crisis intervention _____ Medication _____ Physical health problems _____
Daily living skills _____ Vocational _____ Substance abuse problem _____
Financial _____ Housing/Transportation Arrangements _____ Social/Recreational _____
Supportive Counseling/Psychotherapy _____ Providing Transportation _____
(See reverse side for definitions of categories.)

Scale: 1 = Never 2 = Rarely 3 = Occasionally 4 = Sometimes 5 = Often 6 = Very Often 7 = Always

Current DSM Primary Diagnoses: _____

Does consumer have history of dual or triple primary diagnoses of a substance use disorder and/or mental illness and/or mental retardation: _____ If yes, specify: _____

Check if applicable: Currently utilizing specialized dual diagnosis treatment _____
Needs but currently not utilizing specialized dual diagnosis treatment _____
Has used but currently does not need specialized dual diagnosis treatment _____

APPENDIX E

ASSERTIVE COMMUNITY TREATMENT

PROGRAM IMPLEMENTATION FIDELITY SURVEY

ASSERTIVE COMMUNITY TREATMENT SURVEY

Date _____

Rate the degree to which the statement is an accurate description of your ACT program.

- 3 - very accurate description
- 2 - mostly accurate description
- 1 - somewhat accurate description
- 0 - inaccurate description

TEAM STRUCTURE

<u>Team treatment</u> as opposed to primary therapist treatment model	_____
<u>Multidisciplinary</u>	_____
<u>Psychiatrist on the team</u> minimum time allocated to ACT clients: _____ hours/week (assume 50 clients)	_____
<u>Vocational specialist on the team</u> if not, specialist available as consultant _____ hours/week MINIMUM (assume 50 clients)	_____
<u>Social worker on the team</u> if not, available as consultant _____ hours/week MINIMUM (assume 50 clients)	_____
<u>Registered nurse on the team</u> minimum time allocated to ACT clients: _____ hours/week (assume 50 clients)	_____
<u>Other _____ on the team</u> if not, available as consultant _____ hours/week (assume 50 clients)	_____
<u>Ideal team make-up</u>	# FTEs
Speciality/position	
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Shared caseloads

For service provision

All team members provide service to all clients

Including ...

all community workers
team coordinator
social worker
psychiatrist
vocational specialist
nurses
other

For treatment planning

All team members share in treatment planning for all clients

Including ...

all community workers
team coordinator
social worker
psychiatrist
vocational specialist
nurses
other

Daily team meetings to discuss ACT clients progress

Every client discussed at every meeting

Plan team schedule during team meeting

_____ Ideal number of team meetings/week

_____ Ideal length of team meetings

All team members attend all meetings

Including ...

all community workers
team coordinator
social worker
psychiatrist
vocational specialist
nurses
other

Team size consists of no less than three FTE staff members

One ACT team member is Team Coordinator

The Coordinator provides direct service

_____ hours/week (SPECIFY, minimum)

Responsibilities limited to ACT team - full time director

OTHER STRUCTURE

Team assumes full responsibility for client

As treatment philosophy - "buck stops here"

Organizationally/Procedurally - "Primary therapist"

For treatment provision - (e.g., not a "broker" model)

<u>In vivo treatment focus</u>	_____
_____ Ideal percent contact in home or community	
<u>Office contact avoided</u>	_____
<u>Intensive treatment</u>	_____
_____ Ideal mean number of contacts per week	
<u>24-hour on-call access to team</u> for all clients for emergency services, 7 days a week, 24 hours a day	_____
<u>Low client-staff caseload ratios</u>	_____
_____ List ideal caseload ratio	
<u>ACT office at separate location</u> from other agency programs	_____
<u>DISCHARGE, RETENTION, & ENGAGEMENT</u>	
<u>"No Close" Policy</u> - No required discharge point	_____
<u>Assertive, persistent engagement</u>	_____
_____ Minimum # months client refusals before closing/stopping	
<u>Assertive, persistent follow along</u>	_____
_____ Minimum # months client refusals before closing/stopping	
<u>*Short term ACT</u> recommended for some clients	_____
<u>HOSPITALIZATION AND COORDINATION OF SERVICES</u>	
<u>ACT team actively works to prevent hospitalization</u>	_____
<u>Team continues to work with hospitalized clients</u>	_____
<u>Team members work to coordinate discharge plans</u>	_____
<u>TREATMENT GOALS & FOCI</u>	
<u>Treatment individualized</u> , no closest match to existing program	_____
<u>Team assumes responsibility (control)</u> for much of client's life	_____
<u>Primary treatment goal:</u>	
Increasing community tenure	_____
Increasing community integration	_____
Increasing client functioning	_____
Other _____	_____
<u>Treatment focus:</u>	
Compensate for deficits	_____
Remedy deficits	_____
Build on strengths	_____
Other _____	_____

Relationship between ACT and other services:

ACT in essence replaces other services

Relationship to other services de-emphasized

ACT dependent on other services

Clients assisted in obtaining basic needs

Clients assisted in obtaining entitlements

Clients assisted in obtaining jobs

Clients assisted with living skills/instrumental functioning

Clients assisted in medication/symptom management

Clients assisted in establishing optimally supportive environments

Team works with client's family & natural supports

SERVICE ELEMENTS

Intake assessments conducted upon admission

Provision of psychotherapy is de-emphasized

Clients involved in treatment planning

PROGRAM CAPACITY

Limited team caseload size

_____ Ideal caseload size

CLIENT CHARACTERISTICS

Importance of specific admission criteria

Have severe and persistent mental illness