

## A Randomized Trial of Case Management for Youths With Serious Emotional Disturbance

Barbara J. Burns, Elizabeth M. Z. Farmer,  
Adrian Angold, and E. Jane Costello  
*Duke University Medical Center*

Lenore Behar

*Division of Mental Health, Developmental Disabilities, and Substance Abuse Services,  
North Carolina Department of Human Resources*

*Reports on a randomized trial of case management carried out in conjunction with the Robert Wood Johnson Foundation's Mental Health Services Program for Youth in North Carolina (RWJ MHSPY). Youths with serious emotional disturbance (n = 167) were randomized to either a multiagency treatment team led by a case manager or a multiagency team led by the youth's primary mental health clinician. They were followed for 1 year after entry into the RWJ demonstration. Results show that the addition of an experimental case manager to a youth's treatment team resulted in longer participation in services, use of a wider variety of services, fewer inpatient days, and more community-based services.*

Children and adolescents with serious emotional disturbance (SED) are often served by a variety of providers and agencies. Case management has been advocated as a crucial component to encourage the full range of services necessary to meet a particular youth's needs and to coordinate services from the involved providers (Behar, 1985; Stroul & Friedman, 1986). At present, very little is known about what case management entails or what effect it has on the provision of services and outcomes for youths and their families (Burns, Gwaltney, & Bishop, 1995; Rivera & Kutash, 1994). In this article, we report findings from a randomized trial of case management that was designed to address these issues.

*Case management* can be defined as "a mechanism for linking and coordinating segments of a service delivery system, within a single agency or involving several providers, to ensure the most comprehensive

program for meeting an individual client's needs for care" (Austin, 1983, p. 17). Approaches to children's mental health services and legislation have espoused the centrality of case management in a system of care (Behar, 1985; Education of the Handicapped Act Amendments, 1986; England & Cole, 1992; Omnibus Health Act, 1986; Stroul & Friedman, 1986). Beyond this consensus on its general definition and importance, case management remains an ill-specified and variously implemented paradigm. Debates continue about what activities should constitute case management, who should serve as case managers, whether case management should be carried out by a single case manager or by a team of providers, whether case management itself is a treatment service or simply intended to facilitate service use, and so on. Case management models (Friesen & Poertner, 1995; Harris & Bergman, 1993; Robinson, 1991; Weil & Karls, 1985) have been articulated in an attempt to better understand its key features and to distinguish among its forms.

Research on the effectiveness of case management has been hindered by a number of factors. The imprecision just discussed has made it difficult to adequately describe, replicate, or compare interventions. Such variety, consequently, makes it difficult to compare results. In addition, case management has rarely been introduced as an isolated intervention. Rather, it often is one component of individualized and/or multiagency care. Thus, distinguishing the contribution of case management from the contribution of broader interventions is understandably problematic.

---

This study was supported by funding from National Institute of Mental Health Grants MH48053, MH48085, and MH51410.

We thank Helen Guiles and Betsy Edge for their sustained efforts in conducting the study. We are also grateful to the many individuals who made this project possible through their work on the Robert Wood Johnson Foundation's Mental Health Services Program for Youth, particularly Dan Gerber, Marty Hydacker, Jim Efstation, Angela Ward, and Connie Hays, from the Blue Ridge and Smoky Mountain Mental Health Centers. Substantial further assistance in the preparation of this research report by Linda Maulsby, Duke University Medical Center, is also acknowledged.

Requests for reprints should be sent to Barbara J. Burns, Department of Psychiatry & Behavioral Sciences, Duke University Medical Center, Box 3454, Durham, NC 27710. E-mail: bjb@geri.duke.edu.

Despite these difficulties, a relatively strong literature on case management for adults with severe and persistent mental illnesses has emerged. Although findings have been mixed, the adult literature plays a role in developing and advocating for case management for children. Case management has been associated with a range of benefits, from symptom reduction to improved quality of life and decreased use of psychiatric inpatient services (Burns & Santos, 1995; Chamberlain & Rapp, 1991; Curtis, Millman, Struening, & D'Ercole, 1992; Holloway, 1991; Hornstra, Bruce-Wolfe, Sagduyu, & Riffle, 1993; McGurrian & Worley, 1993).

The research literature on case management for children is just beginning to appear. This literature examines a variety of case management models (e.g., intensive case management and strength-based case management), explores this intervention with diverse populations (e.g., foster children and homeless youths), and places many different types of individuals in the role of case manager (e.g., parents, paraprofessionals, and experienced mental health professionals; Clark et al., 1994; Cauce et al., 1994; Evans et al., 1994; Koroloff, Elliott, Koren, & Friesen, 1994; Rivera & Kutash, 1994). Initial results from these studies have suggested that youths in the defined samples improve over time. The independent effects of the case management intervention appear to be in the areas of decreased incidents of running away, reduced placements in institutional settings, and indications of improvement in internalizing and externalizing behavior problems and self-esteem. Longer term follow-up studies have reported more substantial effects than have short-term follow-up studies.

Our article fits within this ongoing research on case management for youths and extends this research with a randomized trial of case management for youths with SED. We explored the role and effects of case managers in the context of multiagency treatment within a system of care. What types of activities do case managers carry out in such a system? Does the addition of a case manager to a treatment team alter the services a youth receives? Does a case manager lead to more favorable outcomes for youths and/or their families?

## Method

### Setting

The Assessing Coordinated Care (ACC) study was carried out in conjunction with the Robert Wood Johnson Foundation's Mental Health Services Program for Youth (RWJ MHSPY) demonstration in western North Carolina. The RWJ MHSPY was a national demonstration conducted in seven sites across the country that provided resources to develop and improve each locality's continuum and system of care so that youths with SED could be served in their home communities

(Beachler, 1990; England & Cole, 1992). The North Carolina MHSPY site included the 11 western-most counties in the state. This region is characterized by its mountainous terrain and Appalachian culture (Keefe, 1988). The region comprises two mental health catchment areas (known as *Area Programs*). The Blue Ridge Area Program serves the 4 eastern-most counties in the region (including the city of Asheville, population 62,000). The Smoky Mountain Area Program serves the remaining 7 (exclusively rural) western counties.

Prior to commencement of the RWJ MHSPY in 1990, both the Blue Ridge and the Smoky Mountain Area Programs had begun developing a continuum of care and improving interagency relationships. Although most of the essential elements of a continuum of care were in place, the capacity was not sufficient to serve the population in need of services. The RWJ MHSPY demonstration was intended both to develop the system as a whole and to provide a range of previously scarce services to an identified group of children. This targeted group of youths was defined as those who (a) had a diagnosis based on criteria in the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., Rev. [DSM-III-R]; American Psychiatric Association, 1987), (b) showed significant functional impairment, and (c) were in an unstable residential placement (i.e., either currently out of the home or at imminent risk of such a placement). During the RWJ MHSPY, primary development occurred in the area of interagency relationships and system building (Morrissey, Johnsen, & Calloway, in press), case management, therapeutic foster care, day treatment, and in-home services.

### Study Design and Intervention

Youths who participated in the ACC study were randomized to one of two conditions. In the experimental condition, youths were served by a multiagency treatment team that was led by a case manager. In the control condition, the youth's treatment team was led by the youth's primary clinician from the mental health center. This model, therefore, focuses specifically on (a) activities carried out by case managers and whether these activities are similar for clinicians who are asked to fill the role of case manager, (b) differences in service use resulting from the addition of a case manager to the treatment team, and (c) differences in outcomes between youths with an added case manager and those without one.

To qualify for participation in the ACC study, a youth first had to be accepted into the RWJ MHSPY and then meet three additional criteria. First, the youth had to reside in Buncombe or Haywood counties. These two counties contain approximately 60% of the population in the 11-county RWJ MHSPY demonstration site. Buncombe County (which contains the city of

Asheville) is served by the Blue Ridge Mental Health Area Program. Haywood County is served by the Smoky Mountain Area Program. Second, the youth had to be at least 8 years old. This restriction was imposed because it is not clear that youths younger than this can complete the psychiatric assessment that was central to the research interview. Third, the youth could not be the sibling of an enrolled study participant. This criterion was included to reduce the participation burden on parents.

When an eligible youth was admitted to the RWJ MHSPY, a member of the mental health center staff would briefly introduce the study to the youth's parent or guardian and would request permission for the research project coordinator to contact the family. The parents/guardians were contacted (by telephone, if possible, or in person) to invite them and their child to participate. The youths also signed consents to participate. If they agreed to do so, the project coordinator assigned the youth to either the experimental or control group using a computer-generated random numbers list. The youth's group assignment was then given to the RWJ MHSPY coordinator at the appropriate mental health center. The MHSPY coordinator at the mental health center assigned the youth to an available experimental case manager or clinician who was informed that he or she would be the youth's case manager. Parents and youths were each paid a small amount (\$10) for completing the baseline and follow-up interviews.

Once a family was enrolled in the study, an interview was conducted as soon as possible with both the parent and the child. Interviewers were not informed of the child's group assignment. Due to the small number of interviewers and repeated contacts with families, however, it was difficult to keep interviewers blinded to assignment for the duration of the study.

## Measures

Baseline and 1-year follow-up interviews for both parent and youths included the Child and Adolescent Psychiatric Assessment (CAPA; Angold & Costello, 1995; Angold, Cox, Prendergast, Rutter, & Simonoff, 1992; Angold et al., 1995), the Child and Adolescent Services Assessment (CASA; Ascher, Farmer, Burns, & Angold, 1996; Burns, Angold, Magruder-Habib, Costello, & Patrick, 1992; Farmer, Angold, Burns, & Costello, 1994), and the Child and Adolescent Burden Assessment (CABA; Angold et al., in press; Messer et al., 1996; Patrick, Angold, Burns, and Costello, 1993).

The CAPA is an interview that elicits information about symptoms that contribute to a wide range of diagnoses according to taxonomies in the *International Classification of Diseases* (9th & 10th eds; World Health Organization, 1980, 1992) *DSM-III-R*, and the fourth-edition *DSM* (4th ed.; American Psychiatric As-

sociation). It also contains ratings of interviewers' observations of the child's behavior and affect during the interview. The CAPA is an interviewer-based rather than a respondent-based interview. That is, the onus throughout is on the interviewer to use the questions and probes provided in the interview schedule to ensure that participants (a) understand the question being asked, (b) provide clear information on behavior or feelings relevant to the symptom, and (c) display the symptom at a clinical level of severity.

The CASA gathers information about recent (past 3 months) and lifetime use of a wide range of services for mental health problems. It assesses the use of services across six sectors: specialty mental health/substance abuse, general health, education, child welfare, juvenile justice, and informal services. For service use in the recent past, information is collected on the service provider, the number of visits/days, and perceived benefit of the service.

The CABA asks parents about the impact of the child's emotional and behavioral problems on the family. The CABA assesses impact on family finances, relationships (within the family and with nonfamily members), personal activities, and psychological well-being.

Psychometric properties of this set of instruments show that they perform acceptably in clinical samples. Test-retest of the CAPA (Angold & Costello, 1995) shows stability ( $\kappa$ ) of child-reported diagnosis to range from 0.55 (for conduct disorder) to 1.0 (for substance abuse or dependence). Unreliability on reports of conduct problems is associated with self-admitted lying. The CASA (Farmer et al., 1994) shows good overall reliability for children's reports of service use (intraclass correlation coefficient = 0.74). Intensive services (e.g., inpatient and out-of-home care) are reported most reliably. Parent reports show a similar pattern, with parents being somewhat more reliable reporters of the least intensive/intrusive services (e.g., school services and informal help; Ascher et al., in press). The CABA shows high internal consistency (coefficient  $\alpha > .80$ ) and adequate test-retest stability (intraclass correlation coefficient = .67) over a 1-week period (Messer et al., in press).

After finishing the interview, the interviewers used the information they had collected to complete the Child and Adolescent Functional Assessment Scale (CAFAS), which was developed by Hodges (Hodges, Bickman, & Kurtz, 1991). The CAFAS total score used in this study is highly correlated ( $r = .85$ ) with another frequently used measure of functioning, the Children's Global Assessment Scale (Bird, Canino, Rubio-Stipec, & Ribera, 1987).

The complete set of measures was repeated at a 1-year follow-up interview with parents and youths. Parents were also contacted by telephone three times during the year (at 3, 6, and 9 months after the baseline

interview) to gather information on symptomatology and recent service use.

To address issues of case management and service provision in the experimental and control groups more fully, two additional types of information were collected. Data were obtained from the management information system (MIS) at both mental health centers to document services provided by the centers over the course of the year. Self-reports of case management activities were collected from all treatment team members using a form developed for the study, the Case Management Function Form (CMFF). The CMFF was completed at 3-month intervals throughout the year. Team members reported the number of hours they had spent in the previous month either with or on behalf of the particular youth. They then indicated the percentage of this total time that had been spent on various case management activities (e.g., monitoring and advocating).

### Analysis

Analyses focus on differences between the experimental and control groups. Case managers for the experimental group are referred to as *experimental case managers*. Primary clinicians who were placed in the role of case manager for the control group are called *clinician case managers*. Chi-square tests were used to assess significant differences between the groups on dichotomous measures. *T* tests were used for continuous measures. All reported differences were significant at the .05 level.

The results are arranged to focus on the following central questions: What types of activities did case

managers carry out? Were these activities the same for experimental case managers as for clinician case managers? Did youths in the two groups receive different types of services? Did the experimental group display better youth and/or family outcomes than the control group at the 1-year follow-up interview?

### Description of the Sample

The ACC sample contained 167 youths. As shown in Table 1, 82 (49%) were randomized to the experimental group and 85 (51%) to the control group. Approximately half the youths were female, and 77% were White. The racial composition of the sample reflects the child population in this area of North Carolina. The children's ages ranged from 8 to 17 years old. Ninety-six percent of the youths met criteria on the research interview for a *DSM-III-R* diagnosis or significant functional impairment. (The few children without a research diagnosis received clinician diagnoses and reported substantial symptomatology in the research interview.) Many (68%) met criteria for more than one diagnosis. The mean CAFAS score of nearly 60 indicates substantial functional impairment. The experimental and control groups were not significantly different on any of the examined variables. Hence, randomization worked.

Refusal to participate and attrition were both quite low. Fourteen families who were invited to participate refused to do so (8% refusal rate). Of the 167 participants who completed the baseline interview, follow-up data were collected on 148 (89%). Ninety percent of the

**Table 1.** Characteristics of the ACC Sample

Characteristic	Total Sample <sup>a</sup>	Experimental Group <sup>b</sup>	Control Group <sup>c</sup>
Psychometric Symptomatology			
Diagnosis and/or Impairment	161 (96%)	77 (94%)	84 (99%)
Externalizing Diagnosis	129 (77%)	59 (72%)	70 (82%)
Internalizing Diagnosis	78 (47%)	41 (50%)	37 (44%)
Multiple Diagnoses	113 (68%)	50 (61%)	63 (74%)
Functional Impairment			
Mean Total CAFAS Score ( <i>SD</i> )	58.1 (27.2)	57.9 (28.8)	58.3 (26.1)
Race			
White	128 (77%)	67 (81%)	61 (72%)
Black	22 (13%)	6 (8%)	16 (18%)
Other	17 (10%)	9 (11%)	8 (10%)
Sex			
Female	79 (47%)	36 (44%)	43 (50%)
Age (Range = 8 to 17)			
Mean ( <i>SD</i> )	13.3 (2.4)	13.0 (2.6)	13.5 (2.2)
Family Composition of Child Residence			
Both Biological Parents	15.0 (9%)	5.0 (6%)	10.0 (12%)
One Biological Parent	33.0 (20%)	19.0 (23%)	14.0 (16%)
A Biological Parent and Another Adult	41.0 (24%)	18.0 (22%)	23.0 (27%)
No Biological Parent	78.0 (47%)	40.0 (49%)	38.0 (45%)

<sup>a</sup>*n* = 167. <sup>b</sup>*n* = 82. <sup>c</sup>*n* = 85.

experimental group and 87% of the control group completed the follow-up interview at 12 months,  $\chi^2(1, N = 148) = 0.42, p = .52$ . There were no differences in baseline data between study dropouts and youths who remained in the study.

## Results

### Characteristics of Case Management in the Experimental and Control Conditions

We were interested in an overall description of case managers' activities and in whether experimental and clinician case managers carried out these functions in different ways. We expected substantial differences in the activities of experimental and clinician case managers.

Experimental case managers' job description and responsibilities emphasized coordination, outreach, planning, and cross-agency liaison work. Experimental case managers had at least a bachelor's degree and a minimum of 3 years' experience in the human services field. Most were in their late twenties, and 70% were women. Their maximum caseload was 15 to 20 clients.

Clinician case managers, in contrast, were at least master's-level social workers or psychologists with substantial clinical caseloads (approximately 35–40). They did not receive additional training in case management because the aim was to examine how clinicians would enact the role of case manager in usual practice, rather than to test a clinician case manager model.

We expected that children with experimental case managers would receive substantial case management, whereas those with clinician case managers would receive very little case management. We looked at this issue using two sources of data—case managers' self-reports on the CMFF and MIS data from the mental health centers. Table 2 provides summary information from the CMFF on both actual amount of time and the percentage of total time spent on each activity.

Experimental case managers reported spending significantly more time with or on behalf of their clients. They also reported spending this time in quite a different way from the clinician case managers. Experimental case managers spent significantly more absolute time on all of the activities that have been suggested as components of one or more models of case management: outreach; assessment of strengths, needs, and resources; service planning and monitoring; linking/referral/advocacy; and crisis intervention. Experimental case managers spent the largest single portion of their time on planning and/or monitoring activities. Clinician case managers, in contrast, spent a relatively large percentage of their time providing direct services (e.g., therapy). The two types of case managers were similar in the percentage of time they spent on record keeping.

Data from the mental health centers' MIS provide another way to examine the activities of experimental and clinician case managers. Data used in this analysis represent hours that were billed as case management. Billed hours represent an unknown percentage of actual hours spent because of unbillable activities (e.g., record keeping, some travel, and meetings). Comparing the numbers from the MIS with self-reports from the CMFF, it appears that approximately 45% to 50% of case management time appears in the billing records. This percentage is nearly identical for experimental and clinician case managers. Therefore, it appears that the differences in hours recorded in the MIS were not an artifact of different levels of reporting by clinicians and experimental case managers.

MIS data from throughout the year show that clinician case managers provided a consistent low level of case management. Experimental case managers, in contrast, dramatically increased the amount of time they spent per client during the first 4 months on a case. Then, they sustained this level of case management throughout the remainder of the follow-up period,  $\chi^2(1, N = 167) = 35.1, p = .000$ , using a general linear model with random effects assuming a gamma distribution).

A comparison of case management activities by clinician case managers with case management activities of clinicians who were not asked to function as case managers (clinicians on teams that contained an experimental case manager) shows that all clinicians provided a small amount of case management to their clients. Adding a case manager to the treatment team did not reduce the small amount of case management provided by primary mental health clinicians. Conversely, placing the primary clinician in the role of case manager (i.e., as for the control group) did not increase the amount of case management that primary clinicians provided.

### Effects on Service Provision

Next, we explore whether the observed differences in case management were also associated with differences in the provision of other types of mental health services. Data for this portion of the analysis are available from three sources—parent reports of service use (at baseline and at 3, 6, 9, and 12 months), child reports of services use (at baseline and at 12 months), and MIS data on services provided by the mental health centers.

Given both the severity of problems and impairment of youths selected for the RWJ MHSPY demonstration, we expected that service use would persist for at least 1 year. As shown in Figure 1, youths with experimental case managers were more likely to remain in the program over the course of the year than were youths with clinician case managers. During the first 4 months after program entry, both groups showed very little termina-

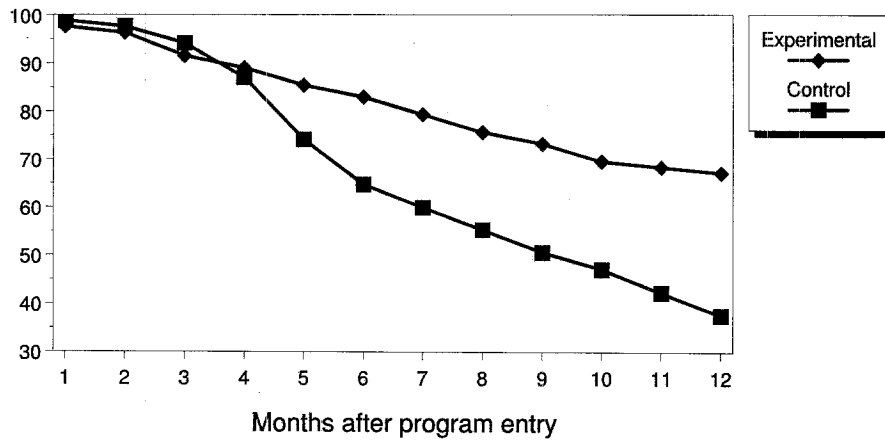
**Table 2.** *Self-Reported Activities by Experimental and Clinician Case Managers*

Activity	Hours per Month (per Client)		% of Time on Each Activity	
	Experimental CM	Clinician CM	Experimental CM	Clinician CM
Outreach	0.76***	0.23	11.3*	5.2
Assessment	0.82***	0.23	12.3**	5.3
Planning/Monitoring	1.96***	0.38	29.3***	8.6
Linking/Advocating	1.01**	0.69	15.1	15.8
Crisis Intervention	0.17*	0.03	2.6*	0.7
Clinical Treatment	0.20***	1.69	3.0***	38.4
Documentation	1.82	1.13	27.2	23.4
Total	6.7*	4.4	100	100

Note: CM = case manager.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Percent still in program



**Figure 1.** Retention in RWJ MHSPY.

tion of service use. Starting at 5 months, however, the control group began showing substantial attrition from the program. By the 1-year follow-up, 67% of the youths with experimental case managers remained actively enrolled in the RWJ MHSPY, whereas only 38% of the youths with clinician case managers were still enrolled,  $\chi^2(1, N = 167) = 14, p = .000$ .

Looking beyond the services provided by the mental health center, experimental case managers also influenced the number of other service types received. A *service* in this analysis refers to contact with a provider or type of service (e.g., outpatient therapy, therapeutic foster care, inpatient hospitalization, and special education). It does not reflect the quantity of service provided. For the first 6 months of the project, both groups received a similar number of service types. For the final 6 months, however, the control group showed a marked decrease in the number of service types, whereas the experimental group continued to receive approximately the same number of service types as before. This result was not a simple artifact of retention in mental health

center care. This pattern of difference between the two groups remained significant when mental health center services were removed from the analysis.

This difference in number of service types received reflects a difference in the level of care that the two groups received. A comparison of results from the 1-year follow-up shows that youths with clinician case managers were somewhat overrepresented in residential treatment centers (11% vs. 3%),  $\chi^2(1, N = 148) = 3.08, p = .07$ , and inpatient settings (7% vs. 1%),  $\chi^2(1, N = 148) = 3.7, p = .05$ . Youths with experimental case managers, in contrast, were significantly more likely to use therapeutic foster care (11% vs. 2%),  $\chi^2(1, N = 148) = 4.95, p = .03$ , mental health center outpatient services (53% vs. 33%),  $\chi^2(1, N = 148) = 6.91, p = .009$ , family physicians (11% vs. 2%),  $\chi^2(1, N = 148) = 4.95, p = .03$ , and case management (41% vs. 15%),  $\chi^2(1, N = 148) = 13.73, p < .001$ .

These results focused on dichotomous indicators of which services were delivered. The next logical issue was whether the two groups also received different

amounts of service within any particular settings. With the exception of case management (which was discussed already) and inpatient services (which are discussed in the following section), the volume of services within a setting did not differ between the two groups. Experimental case managers appear to have influenced the number and types of services provided, but they did not increase the intensity of services among children who received services within a setting.

### Effects on Inpatient Services

One of the primary goals of the RWJ MHSPY was to reduce inpatient and out-of-home placements. Figure 2 shows the percentage of youths in experimental and control groups who were inpatients at baseline and/or 12 months. At baseline, 49 participants (29% of the sample) were in inpatient settings. Youths in the experimental group were somewhat but not significantly more likely to be inpatients at baseline. By the 12-month follow-up, only 7 youths were in such settings. Of these, 1 was from the experimental group and 6 were from the control group,  $\chi^2(1, N = 148) = 3.7, p = .05$ .

The majority of youths from both groups who were discharged from inpatient settings were living at home at follow-up (68% of control group youths and 67% of experimental group youths). Among those who did not return home, however, the two groups were different. None of the experimental group youths remained in an inpatient setting at follow-up, whereas 9% of control group inpatients did,  $\chi^2(2, N = 49) = 5.1, p = .02$ . Thirty-three percent of experimental group participants were living in community-based residential settings (e.g., therapeutic foster care and group homes) compared with 22% of relevant control group participants (not a statistically significant difference).

In addition to the number of youths who were inpatients, it is also informative and important to look at their number of days of inpatient use by the two groups.

These comparisons are based on data that cover the period from 6 to 12 months after baseline. This time frame covers the period during which the two groups were receiving quite different levels and types of case management. During this period, mean number of inpatient days for youths who were in hospitals was not different between the two groups. Inpatients from the experimental group averaged 9 days, whereas those from the control group averaged 13.4 days ( $t = .72, p = .49$ ). The small size of the relevant samples and the variation within groups makes this difference of 4 days nonsignificant. The distribution of inpatient episodes, however, looks quite different between the two groups. Nine youths from the control group but only three youths from the experimental group were inpatients at any time during this 6-month window. As a group, these control group youths accounted for 136 inpatient days. In contrast, as a group, the experimental group youths spent a total of 30 days as inpatients. The longest inpatient episode for an experimental group youth was 15 days. In contrast, 3 control group youths had lengths of stay longer than this, with a longest stay of 42 days.

To further examine what may appear to be a substitution of community-based residential care for hospital inpatient use, a detailed breakdown of days in these settings for the latter 6 months of the study is presented in Table 3. Youths in the control group were more likely to be placed in residential treatment centers, whereas youths in the experimental group were placed in less restrictive therapeutic foster care. Both groups were likely to utilize group homes.

The costs of residential placements, based on median daily costs for these facilities in North Carolina at the time of the study, were assigned. There was a savings of \$94,574 for residential costs for the experimental group. However, the additional costs of experimental case managers also has to be considered. Based on the annual salary and benefits of case managers (\$22,000) and a caseload of 20 clients, the annual cost of case management is estimated at \$1,100 per client or a total

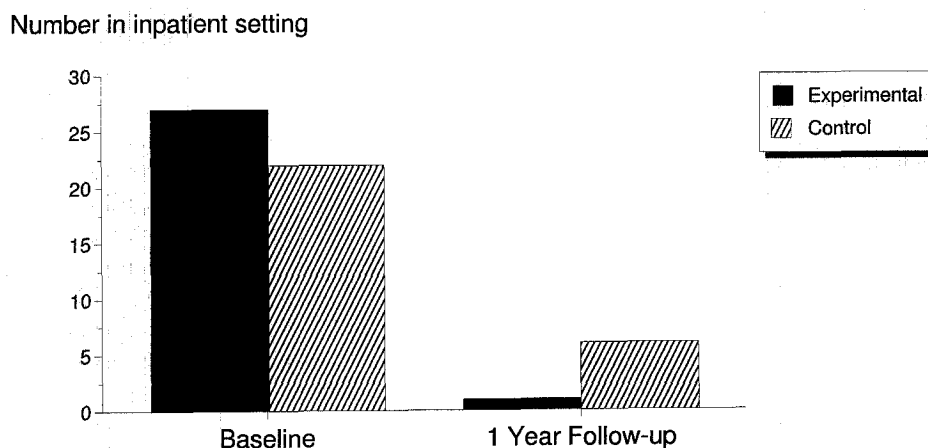


Figure 2. Psychiatric inpatient placement, baseline to follow-up.

**Table 3.** *Use of Out-of-Home Placements (Last 6 Months of Study)*

Facility Type	Cost per Day	Number of Days by Facility Type		Costs by Facility Type	
		Control	Experimental	Control	Experimental
Hospital	\$420	136	30	\$51,120	\$12,600
Residential Treatment Center	\$130	814	308	\$105,820	\$40,040
Group Home	\$68	896	754	\$60,928	\$51,278
Therapeutic Foster Care (Including Crisis Stabilization)	\$56	104	558	\$5,824	\$31,248
Total Costs	—	—	—	\$229,692	\$135,166

of \$90,200 for a year for 82 experimental clients. The difference between the savings for residential days (\$94,575) and case management costs (\$90,200) represents a new savings of \$4,384. This savings, although small given the sample size, could be substantial for greater numbers of youths over longer periods of time.

### Effects on Other Family and Individual Outcomes

The preceding results on placements suggest that experimental case managers may have been influential in reducing inpatient placements and in finding less restrictive community-based alternatives. These findings also portray a pattern that is repeated in the analysis of individual and family outcomes. Over the course of the year, the youths and their families in both conditions improved. Overall improvements were seen in (a) functional status, as measured by CAFAS scores ( $\Delta = -20$ ,  $p = .000$ ) and incapacity scores from the CAPA ( $\Delta = -2.6$ ,  $p = .01$ ), (b) number of symptoms ( $\Delta = -2.6$ ,  $p = .000$ ), and (c) family burden ( $\Delta = -2.5$ ,  $p = .003$ ). For all of these 1-year outcomes, however, there were no significant differences in improvement between the experimental and control groups.

For several family and individual outcomes, however, there were significant differences between the two groups. Parents of youths with experimental case managers reported more positive assessments of their experiences with the mental health centers. Seventy-one percent of those with experimental case managers reported at the 1-year follow-up interview that the mental health center had been "definitely helpful" compared to 61% of control group parents ( $p = .02$ ). In addition, more experimental group parents increased their assessment of benefit from mental health center care over the course of the year (42% vs. 21%).

The two groups were very similar on changes in symptoms and clinical status. However, there was an indication that impairment related to substance use (as measured by the CAPA incapacity ratings) decreased more substantially for experimental participants than for control participants ( $p < .05$ ). Incapacity ratings

indicate the degree of impairment in a variety of life spheres (e.g., relationship with parents, various facets of school behavior, and spare time activities) resulting from a problematic behavior (in this case, alcohol and/or drug use). From baseline to 12-month follow-up, 16% of experimental group youths showed decreased incapacities in this area, and only 2% showed increased incapacities. This compares to 8% of the control group who showed decreased incapacities and 8% who showed increased incapacities. This result was consistent across parent and child reports. The reduction in incapacity among experimental group youths reflects a reduction in self-reported alcohol consumption by the youths with experimental case managers. This difference is the only indication of any group difference in clinical outcomes.

Given the number of comparisons involved, we cannot rule out chance as an explanation for the relationships between case management and satisfaction or substance use impairment. However, the results suggest possible relationships that warrant exploration in future studies.

### Discussion and Conclusions

We explored group differences in a randomized trial of case management among youths with SED. Youths who were participating in the RWJ MHSPY in western North Carolina were randomized to receive either treatment by a multiagency treatment team that was led by a case manager (experimental group) or treatment by a multiagency treatment team in which the child's primary mental health clinician was asked to fill the role of case manager (control group). Analyses focused on differences in activities by experimental and clinician case managers, differences in service provision between the two groups, and differences in outcomes.

Experimental case managers spent significantly more time with or on behalf of their clients than did clinician case managers. They spent both more absolute time and a larger percentage of their time on outreach, assessment, planning/monitoring, and crisis intervention. Clinician case managers, in contrast and as unex-



pected, spent the largest portion of their time providing direct clinical services. Formally placing clinicians in the role of case manager did not appear to increase the amount of time that they spent providing case management services. Without reduced caseloads and special training in case management, this study suggests that clinicians are unlikely to take on case management functions.

Youths with experimental case managers remained in the RWJ MSHPY demonstration for a longer period of time, received a broader array of services during the final months of the intervention, and were more likely to receive community-based (as opposed to out-of-community) services. Youths in the experimental group were less likely to have been inpatients at follow-up, and they spent substantially fewer days in hospitals than control group youths. Further, when placed out of the home, experimental youths were likely to be in less restrictive settings.

The results of this study suggest that case managers can be instrumental in preventing placements in institutional settings and in reducing lengths of stay when such placements do occur. Our findings of a multi-agency team with case management are consistent with the adult literature in which a team approach has been utilized for case management and treatment (Burns & Santos, 1995). Such findings are rare in studies in which case managers operate independently (i.e., broker model; Chamberlain & Rapp, 1991; Curtis et al., 1992; Holloway, 1991; Hornstra et al., 1993; McGurrian & Worley, 1993).

On average, the entire sample improved over the course of the year. Significant improvements were found on many outcomes, but significant differences in improvement between the two groups was observed only for a few outcomes. In particular, parents of experimental youths reported greater satisfaction with the mental health center services, and experimental group youths showed less impairment due to alcohol consumption.

How far can these findings be generalized, and what do they say about the role of case managers in providing care for youths with SED? They suggest that case managers can and do influence the number, types, and duration of services. Experimental case managers increased tenure in the RWJ MSHPY demonstration and decreased use and duration of inpatient services and residential treatment centers. These findings suggest that case managers may be very beneficial in encouraging the types of service use that are desired in a continuum of care or system of care model. The findings from this randomized study, however, do not provide strong evidence of individual- or family-level advantages of experimental case managers.

These findings must be considered both seriously and cautiously. Several factors may have contributed to the relatively few between-group differences. First,

there was a significant difference in inpatient hospital utilization between the two groups. Given the centrality of this outcome to the goals expressed by the RWJ MSHPY, a great deal of focus and many resources were used to accomplish this basic goal. Such an emphasis may have diminished efforts in other areas.

Second, over the course of the year, youths in both groups improved in multiple arenas (i.e., symptoms, functional status, and family burden). Such overall improvement may be attributable to the quality of treatment that all youths received, rather than case management per se. This overall pattern of improvement made it more difficult to observe between-group differences.

Third, the dose of the intervention was not carefully controlled in the ACC study. Case management hours and duration of program participation varied widely in both groups. On average, youths with experimental case managers stayed in the demonstration longer and received more case management. However, there was substantial overlap in service intensity and duration between the two groups. Such within-group variation makes it difficult to detect between-group differences. Such variation, however, does reflect the real world of service delivery (Burns, 1994).

Fourth, even if every member of the experimental group had received at least the mean dose, may not this have been sufficient to achieve the desired effect? The appropriate intensity of case management within a system of care has not yet been determined (Burns et al., 1995).

Fifth, this study was a stringent test of the impact of case management for several reasons. First, it dealt with a region's most severe children (i.e., those with psychiatric diagnosis, functional impairment, and residential instability). One can argue that such multineed youths are precisely the ones for whom case management is most necessary. It is also likely that this is a group for whom meaningful clinical and functional improvements are most difficult to achieve (Duchnowski, Hall, Kutash, & Friedman, in press). Second, the ACC study operated within the context of the RWJ MSHPY. Therefore, both experimental and control youths were receiving care in a service system that was fairly well developed, that had operating interorganizational ties, and that was making a real commitment to the treatment of its most difficult clients. All youths, regardless of randomization, also had access to some form of case management. Third, the time frame for the follow-up was quite short. One year is probably the minimal time interval that is reasonable for examining changes. Analyses of the ACC data show, however, that the two groups did not differ in the intensity or types of services until 4 to 6 months after intake. Differences between the groups could not begin to be attributed to differences in treatment until this point. Therefore, a longer follow-up period would have been very useful to allow the two

groups time to experience the different interventions for a substantial duration fully.

Perhaps one of the most intriguing findings from the analyses focuses on the importance of case managers in keeping children both out of hospitals and engaged in community-based treatment. Several of the analyses converged to suggest that, for both groups, the first 3 to 6 months after entering the RWJ MHSPY demonstration was a period of relatively high involvement by the youths. After this initial period, however, youths without case managers were more likely to return to or remain in hospitals and to drop out of the demonstration. This suggests that case management is, perhaps, not as important initially as it is with ongoing care. These findings suggest a need for additional research on how case managers accomplish their goals and on the proper balance of resources to most effectively serve youths throughout their treatment careers.

The ACC study provides important information about the activities of case managers and the types of services and outcomes that may be associated with different types of case managers. However, based on the factors described, caution should be used in generalizing these findings. A longer follow-up period, a larger sample size, and a more fully monitored intervention would be necessary to see if differential improvements in individual- and family-level outcomes can be produced and captured.

## References

- American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed., Rev.). Washington, DC: Author.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Angold, A., & Costello, E. J. (1995). A test-retest reliability study of child-reported psychiatric symptoms and diagnoses using the Child and Adolescent Psychiatric Assessment (CAPA-C). *Psychological Medicine*, 25, 755-762.
- Angold, A., Cox, A., Prendergast, M., Rutter, M., & Simonoff, E. (1992). *The Child and Adolescent Psychiatric Assessment (CAPA)*. Durham, NC: Duke University Medical Center.
- Angold, A., Messer, S. C., Stangl, D. K., Farmer, E. M. Z., Costello, E. J., & Burns, B. J. (in press). Perceived parental burden as a predictor of service use for child and adolescent psychiatric disorders. *American Journal of Public Health*.
- Angold, A., Prendergast, M., Cox, A., Harrington, R., Simonoff, E., & Rutter, M. (1995). The Child and Adolescent Psychiatric Assessment (CAPA). *Psychological Medicine*, 25, 739-753.
- Ascher, B. H., Farmer, E. M. Z., Burns, B. J., & Angold, A. (1996). The Child and Adolescent Services Assessment (CASA): Description and psychometrics. *Journal of Emotional and Behavioral Disorders*, 4, 12-20.
- Austin, C. (1983). Case management in long-term care: Options and opportunities. *Health and Social Work*, 8, 16-30.
- Beachler, M. (1990). The mental health services program for youth. *Journal of Mental Health Administration*, 17(1), 115-121.
- Behar, L. (1985). Changing patterns of state responsibility: A case study of North Carolina. *Journal of Clinical Child Psychology*, 14, 188-195.
- Bird, H. R., Canino, G., Rubio-Stipec, M., & Ribera, J. C. (1987). Further measures of the psychometric properties of the children's global assessment scale. *Archives of General Psychiatry*, 44, 821-824.
- Burns, B. J. (1994). The challenges of child mental health services research. *Journal of Emotional and Behavioral Disorders*, 2(4), 254-259.
- Burns, B. J., Angold, A., Magruder-Habib, K., Costello, E. J., & Patrick, M. K. S. (1992). *The Child and Adolescent Services Assessment (CASA)*. Durham, NC: Duke University Medical Center.
- Burns, B. J., Gwaltney, E. A., & Bishop, G. K. (1995). Case management research issues and directions. In B. J. Friesen & J. Poertner (Eds.), *From case management to service coordination for children with emotional, behavioral, or mental disorders: Building on family strengths* (pp. 353-372). Baltimore, MD: Brookes.
- Burns, B. J., & Santos, A. B. (1995). Assertive community treatment: An update of randomized trials. *Psychiatric Services*, 46, 669-675.
- Cauce, A. M., Morgan, C. J., Wagner, V., Moore, E., Sy, J., Wurzbacher, K., Weeden, K., Tomlin, S., & Blanchard, T. (1994). Effectiveness of intensive case management for homeless adolescents: Results of a 3-month follow-up. *Journal of Emotional and Behavioral Disorders*, 2, 219-227.
- Chamberlain, R., & Rapp, C. A. (1991). A decade of case management: A methodological review of outcome research. *Community Mental Health Journal*, 27, 171-188.
- Clark, H. B., Prange, M. E., Lee, B., Boyd, L. A., McDonald, B. A., & Stewart, E. S. (1994). Improving adjustment outcomes for foster children with emotional and behavioral disorders: Early findings from a controlled study on individualized services. *Journal of Emotional and Behavioral Disorders*, 2, 207-218.
- Curtis, J. L., Millman, E. J., Struening, E., & D'Ercole, A. (1992). Effect of case management on rehospitalization and utilization of ambulatory care services. *Hospital and Community Psychiatry*, 43, 895-899.
- Duchnowski, A., Hall, K., Kutash, K., & Friedman, R. (in press). The alternatives to residential treatment study. In M. Epstein, K. Kutash, & A. Duchnowski (Eds.), *Community-based programming for children with serious emotional disturbances and their families: Research and evaluation*. Austin, TX: Pro-Ed.
- Education of the Handicapped Act Amendments of 1986, Pub. L. No. 99-457, Title 20 U.S.C. 1400 et seq. Stat. 100, 1145-1177.
- England, M. J., & Cole, R. F. (1992). Building systems of care for youth with serious mental illness. *Hospital and Community Psychiatry*, 43, 630-633.
- Evans, M. E., Armstrong, M. I., Dollard, N., Kupping, A. D., Huz, S., & Wood, V. M. (1994). Development and evaluation of treatment foster care and family-centered intensive case management in New York. *Journal of Emotional and Behavioral Disorders*, 2, 228-239.
- Farmer, E. M. Z., Angold, A., Burns, B. J., & Costello, E. J. (1994). Reliability of self-reported service use: Test-retest consistency of children's responses to the Child and Adolescent Services Assessment (CASA). *Journal of Child and Family Studies*, 3, 307-325.
- Friesen, B. J., & Poertner, J. (Eds.). (1995). *From case management to service coordination for children with emotional, behavioral, or mental disorders: Building on family strengths*. Baltimore, MD: Brookes.
- Harris, M., & Bergman, H. C. (Eds.). (1993). *Case management for mentally ill patients: Theory and practice*. Langhorne, PA: Harwood Academic.
- Hodges, K., Bickman, L., & Kurtz, S. (1991). Multidimensional measure of level of functioning for children and adolescents. In A. Algarin & R. M. Friedman (Eds.), *4th Annual Research Conference Proceedings, A system of care for children's mental health: Expanding the research base* (pp. 149-154). Tampa:

- University of South Florida, Florida Mental Health Institute, Research and Training Center for Children's Mental Health.
- Holloway, F. (1991). Case management for the mentally ill: Looking at the evidence. *International Journal of Social Psychiatry, 37*, 2-13.
- Hornstra, R. K., Bruce-Wolfe, V., Sagduyu, K., & Riffle, D. W. (1993). The effect of intensive case management on hospitalization of patients with schizophrenia. *Hospital and Community Psychiatry, 44*, 844-847.
- Keefe, S. E. (Ed.). (1988). *Appalachian mental health*. Lexington: University Press of Kentucky.
- Koroloff, N. M., Elliott, D. J., Koren, P. E., & Friesen, B. J. (1994). Connecting low-income families to mental health services: The role of the family associate. *Journal of Emotional and Behavioral Disorders, 2*, 240-246.
- McGurrin, M. C., & Worley, N. (1993). Evaluation of intensive case management for seriously and persistently mentally ill persons. *Journal of Case Management, 2*, 59-65.
- Messer, S. C., Angold, A., Costello, E. J., Burns, B. J., Farmer, E. M. Z., & Patrick, M. K. S. (in press). *The Child and Adolescent Burden Assessment (CABA): Measuring the family impact of emotional and behavioral problems*.
- Morrissey, J. P., Johnsen, M. C., & Calloway, M. O. (in press). Service system performance and change: Findings from the Robert Wood Johnson Children's Mental Health Initiative in North Carolina. *Journal of Mental Health Administration*.
- Omnibus Health Act of 1986, Pub. L. No. 99-660, Title 42, U.S.C. 300x et seq. Stat. 100, 3794-3797.
- Patrick, M. K. S., Angold, A., Burns, B. J., & Costello, E. J. (1992). *The Child and Adolescent Burden Assessment*. Durham, NC: Duke University Medical Center.
- Rivera, V. R., & Kutash, K. (1994). *Components of a system of care: What does the research say?* Tampa, FL: University of South Florida, Florida Mental Health Institute, Research and Training Center for Children's Mental Health.
- Robinson, G. (1991). Choices in case management. *Community Support Network News, 7*(3), 11-12.
- Stroul, B. A., & Friedman, R. M. (1986). *A system of care for severely emotionally disturbed children and youth*. Washington, DC: CASSP Technical Assistance Center, Georgetown University Child Development Center.
- Weil, M., & Karls, J. M. (1985). *Case management in human service practice: A systematic approach to mobilizing resources for clients*. San Francisco: Jossey-Bass.
- World Health Organization. (1980). *International classification of diseases (9th rev., clinical modification)*. Geneva: Author.
- World Health Organization. (1992). *International statistical classification of diseases and related health problems (10th rev.)*. Geneva: Author.

Received May 26, 1995

Final revision received February 29, 1996