CHILD, FAMILY, AND SYSTEM OUTCOMES OF INTENSIVE CASE MANAGEMENT IN NEW YORK STATE

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New York State's Children and Youth Intensive Case Management (CYICM) was implemented in 1988 as one of several community-based initiatives for children with serious emotional disturbance (SED). Underlying this program is the goal of maintaining children with SED in the least restrictive environment appropriate to their needs. This paper presents CYICM child, family, and system outcomes over six years, describes program refinements, and explores continuing research efforts. Data are supportive of the positive outcomes associated with intensive case management for children with SED. Associated with enrollment in CYICM are a decrease in symptoms, improvement in functioning, and fewer hospitalizations in state-operated psychiatric centers, which translates into cost savings and a possible reduction in hospital beds.

Throughout the United States, case management lies at the heart of community-based systems of care for children with serious emotional disturbance (SED). Despite its centrality and wide geographic dispersion, few studies have systematically studied the outcomes of case management for children with SED. Burns, Gwaltney and Bishop (1) have described the research agenda for

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case management. Evans, Banks, Huz et al. (2) have described the initial hospitalization and community tenure outcomes for children enrolled in the intensive case management program in New York State. Burns, Farmer, Angold et al. have presented the findings of a field study of case management in North Carolina. These studies have generally shown positive outcomes for children and important system changes. The purpose of this article is to present the child, family and system outcomes of our six-year study of case management for children and youth in New York State and to describe the resulting program refinements and continuing research efforts.

In 1988-89 the New York State Office of Mental Health established Children and Youth Intensive Case Management (CYICM) as one of several statewide, community-based interventions whose primary goal is to keep children with SED in the least restrictive environment appropriate to their needs. Prior to the initiation of treatment foster care, in-home crisis services, and then CYICM, the primary services offered to children and adolescents with SED were inpatient treatment, primarily in state-operated hospitals, and clinic services. Hospitalization is costly, often stigmatizing and offered at limited sites, creating hardship for families, while clinic services are insufficiently intensive to provide the treatment and ancillary services required by children with SED.

CYICM is an intensive, child-centered service provided to children under 18 years who have SED. The service is offered in natural settings, i.e., homes, schools and community environments, with a goal of maintaining children in these settings. The specific services provided by intensive case managers are determined by the needs of the child and delivered within the context of the family or community setting where the child lives. The process for enrollment of children referred to CYICM includes a review by an interagency committee, and children are rostered by name according to their level of need for the service. At the time that this research was conducted, each intensive case manager had a maximum caseload of 10 children and $2,000 per child per year to purchase individualized services or to develop new services for the target population of children. Part of what makes

CYICM so intensive is that the service is available around the clock, seven days a week.

A three-phase evaluation has been used in examining the outcomes of CYICM. First, we have used program monitoring through the collection of a minimum data set on all children at enrollment and at termination (2). This data set provides us with information on the characteristics of all children who have been enrolled in CYICM; currently we have data on 3,336 children. Second, we have conducted a longitudinal evaluation of a 30% random sample of children who were enrolled in CYICM at a given point in time. For this sample of 199 children, we obtained information on child functioning using the Child and Adolescent Functional Assessment Scale (CAFAS) (4), symptoms and problem behaviors using the Child Behavior Checklist (CBCL) (5), and child and family needs. Data were collected on enrollment and at three years or discharge, whichever came first. Third, we have used an existing database, the Department of Mental Hygiene Information System (DMHIS) to examine the hospitalization histories of enrollees in CYICM before and after their enrollment in CYICM. These data were also used to examine their state hospital use as compared to a matched sample of children hospitalized in the state system who had not been enrolled in CYICM. These three efforts are described in greater detail below.

PHASE 1: DESCRIPTION OF ENROLLED CHILDREN

The following description is based on the 3,336 children who have been enrolled in CYICM since 1988 (See Table 1). The mean age on enrollment is 12 years. Most children are non-Hispanic white (61%) and male (67%). Nearly half (49%) live in single-parent families and 77% are in the custody of biological parent(s). More than half (57%) are in special education programs and 45% have disruptive behavior diagnoses such as attention deficit hyperactivity disorder, oppositional defiant disorder or conduct disorder. On average, these children have been placed out of home, either in a hospital or residential settings, two times because of their mental health problems. They are impaired in an average of 2.5

TABLE 1
Characteristics of Children Enrolled in Intensive Case Management

Number of children enrolled	3,336
Mean admission age	12 years
Percent Non-Hispanic white	81%
Percent male	87%
Percent in single parent households	48%
Percent in custody of biological parent(s)	77%
Percent in special education placement	57%
Percent with disruptive behavior diagnosis	45%
Mean number family disruptions	2.0
Mean areas of functional impairment	2.5
Mean number problem behaviors/symptoms	5.8
Length of stay (mean days; N = 1,653)	421; SD = 320
Maintained in family settings (N= 1,653)	70%

of 5 areas of functioning and have a mean of 5.8 problem behaviors or symptoms. Children discharged from CYICM (*N* = 1,653) have been enrolled an average of 421 days (*SD* = 320 days), and 70% of those who were in home settings on enrollment have continued in these settings on discharge.

PHASE 2: EVALUATION OF CHILD AND FAMILY OUTCOMES

The longitudinal evaluation was conducted on a 30% sample of 199 children randomly selected from the caseloads of intensive case managers. The logic model guiding the research is shown in Figure 1. This model indicates that service system and organizational characteristics, intensive case manager characteristics and child and family characteristics, status and functioning interact to influence intensive case management behavior, such as frequency of contact, length of contact, and services provided. In-

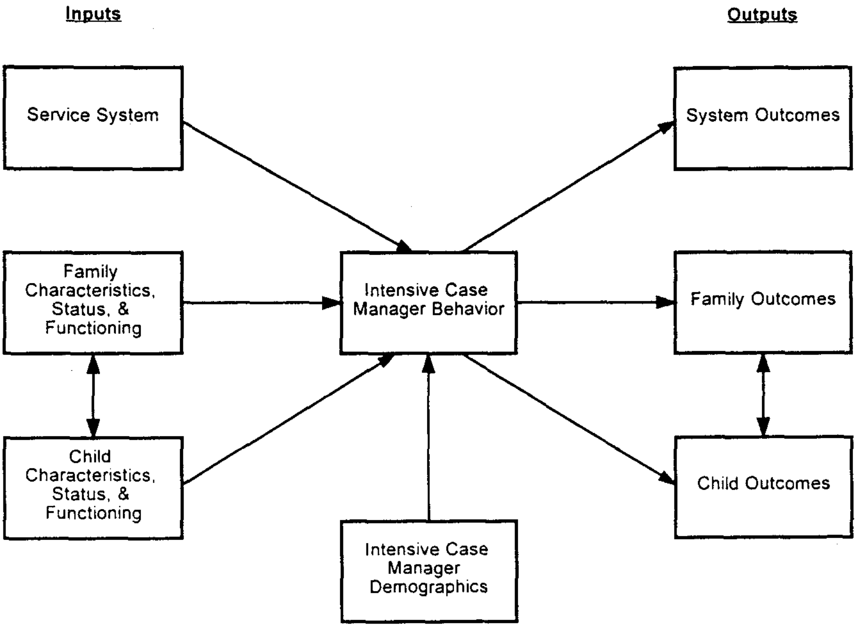


FIGURE 1. Logic model for evaluation of Children and Youth Intensive Case Management.

tensive case management behavior, in turn, produces certain service system outcomes, such as use of hospitalization and costs of care, and child and family outcomes such as changes in functioning and satisfaction with care.

Shortly after enrollment, intensive case managers were asked to identify family conditions that might interfere with an identified child's treatment. The following conditions were identified: poverty (53% of families), unstable family relationships (60%), adults abused as children (41%), mental illness in a family member other than the proband (56%), chronic unemployment (33%), domestic violence (27%), and alcohol and/or substance abuse (30%).

A comparison of unmet service needs on enrollment and at discharge or three years later shows significant decreases in unmet needs in the following areas: medical needs ($p < .05$), recreational needs ($p < .01$), and educational needs ($p < .05$). No significant decrease was noted in mental health or social support needs, which remains particularly high at approximately 78% of enrolled children in the sample.

On admission the mean total number of symptoms in the sample was 5.4. At discharge or three years post-enrollment, the mean had dropped to 3.1 ($p < .01$). Figure 2 presents the significant changes in problem behaviors and symptoms as rated by intensive case managers. Aggressive behaviors, anxiety, suicidal thoughts and behaviors, psychotic behavior and fire setting and cruelty to animals all decreased significantly ($p < .01$). Relatedly, caregiver ratings of the child's behavior, using the CBCL, indicated a significant decrease in total problem T score from admission to discharge, dropping from a mean score of 69.7, well above the clinical cutoff, to a mean of 66.2 ($p < .05$). The internalizing T score dropped significantly from 65.4 to 62 ($p < .05$), while the externalizing T score although decreasing failed to achieve statistical significance (69.3 vs. 67.4).

Of four major areas of child functioning rated by the CAFAS—Role Performance, Thinking, Behavior toward Self/Others, and Moods and Emotions—over time the sample of children showed significant improvement only in Behavior toward Self/Others ($p < .05$). Caregiver resources measured by the CAFAS did not change over the course of the evaluation.

PHASE 3: DATABASE EXAMINATION OF HOSPITALIZATION OUTCOMES

To examine the effectiveness of CYICM in regard to decreasing hospitalization and increasing community tenure, we matched hospital admission records from DMHIS to data on all children enrolled in CYICM. Given the time-ordered nature of DMHIS, the file was constructed with a cutoff date of February 28, 1994, meaning that some children may have had inpatient admissions and/or discharges beyond the cutoff date that are not reflected in the data reported here. This procedure resulted in a data file of 917 children with a total of 1,551 state hospital inpatient admissions. The analyses reported below track the inpatient experiences of each child over four years, two years preceding and two years following CYICM enrollment.

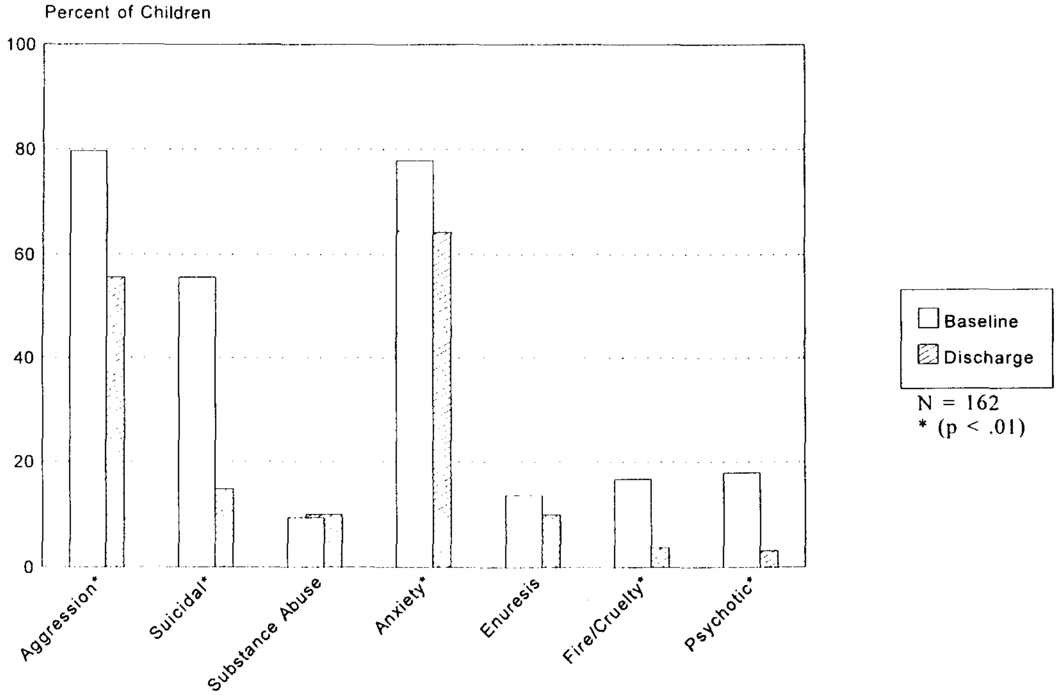


FIGURE 2. Percent of children displaying symptom at baseline and three years or discharge.

Initially a single-group, pre/post analytic strategy was used to predict post-CYICM enrollment utilization based on observed levels of utilization over the period preceding enrollment. Figure 3 shows a decrease in hospitalization from approximately 10 days per month shortly before enrollment in CYICM to about 2 days per month following enrollment. The drop in hospitalization is immediate, significant ($p < .05$), and sustained over time.

The second analytic strategy was to use a pre/post matched case analysis to examine hospital utilization of enrollees in CYICM and similar non-enrollees over 24, 90-day intervals, representing a six- year period extending from March 1, 1988, to March 1, 1994. Using DMHIS, a comparison group of 392 children was constructed, matched on age at first admission to the hospital, gender, race/ethnicity, residential region of the state, diagnosis and total number of inpatient admissions, and days spent in the hospital. Regression discontinuity analysis was used to examine the patterns of hospital use over time. Figure 4 shows that although the enrollees in CYICM used more hospital days than the comparison group before CYICM enrollment (7 days/quarter vs. 5 days/quarter), their use of inpatient services dropped significantly following enrollment to less than 1 day/quarter as compared to 3.5 days/quarter on average for the comparison group ($p = .01$).

Since decreased use of hospitalization can result in cost savings, a matched comparison group analysis was used to estimate the savings that could be realized by children enrolled in CYICM. If patterns of decreased inpatient utilization are annualized, children enrolled in CYICM show a decline of 83% in state inpatient utilization. This compares to a decline of 34% for children in the unserved comparison group for the same period. The average daily cost of caring for a child in a state inpatient setting during the fiscal year ending in March 1994 was $608.45. Using this figure to compute cost differential between the CYICM group and the matched comparison group, the difference in reduced utilization patterns translates to a savings of nearly $8,000,000.

Characteristics of children who experience successful discharges from CYICM were isolated using a logistic regression analytic approach. The model constructed successfully classified

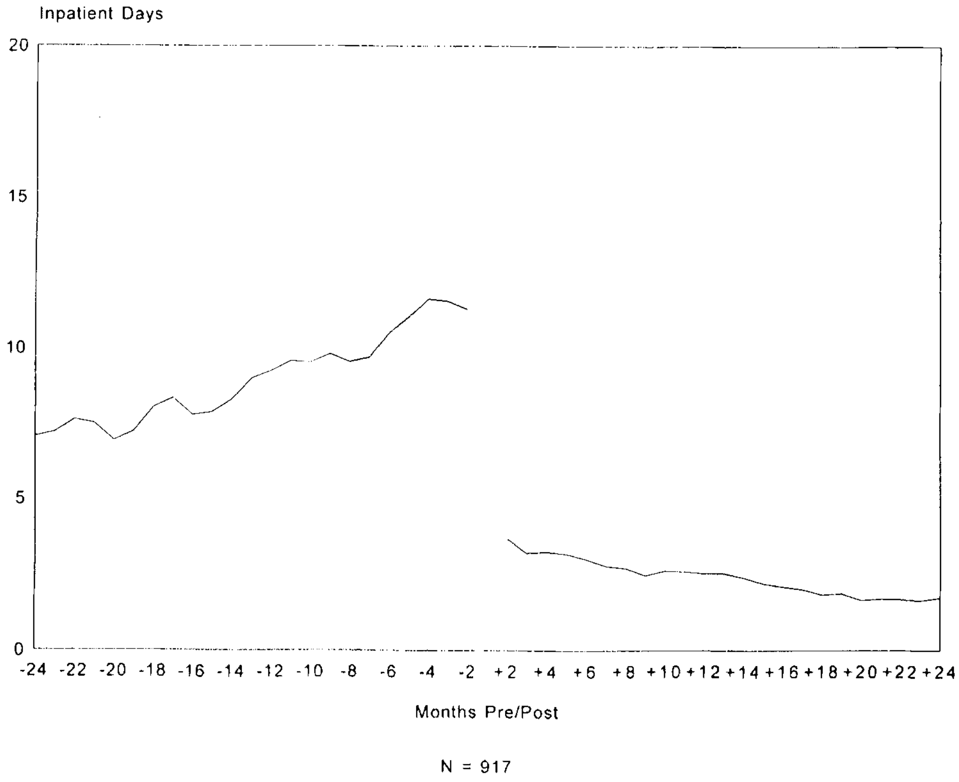
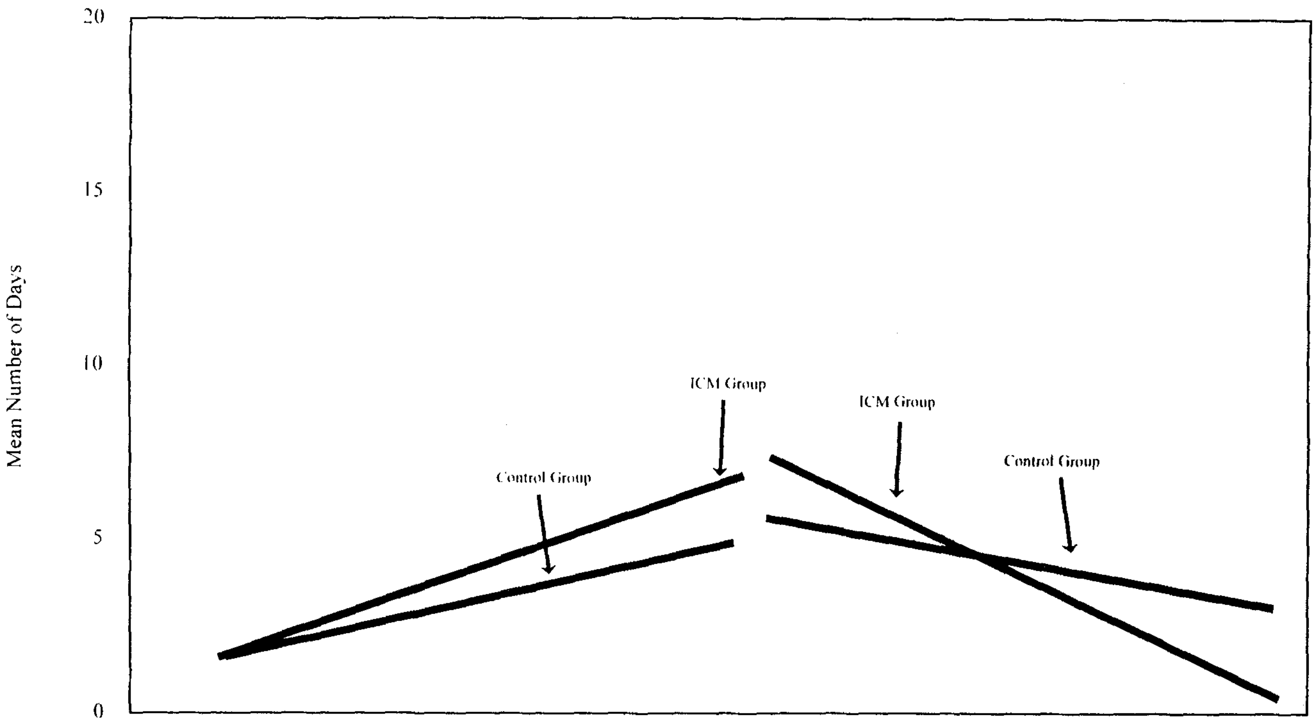


FIGURE 3. Pre/Post CYICM state inpatient utilization.



N = 784 (392 X 2); 90 day intervals

FIGURE 4. Pre/Post inpatient utilization of ICM and non-ICM controls.

TABLE 2
Post-Intensive Case Management: Discharge Disposition

Measure	*Probability of Successful Discharge*	*Difference in Probability*	*Highest Probability of Successful Discharge Predicted by the Model*
Change in strength of family relationship*	.29 (decrease in strength)	.63	0.93 (strengthening during CYICM enrollment)
Child in CAFAS scale score*	.46 (decrease in scale score)	.47	0.93 (increase in scale score at discharge)
Change in symptoms index*	.52 (decline of 2 reported symptoms)	.41	0.93 (unchanged number of symptoms)
Age at enrollment*	.59 (15 years old)	.34	0.93 (11 years old)

N = 63

*$p < .05$ Model successfully classifies 87% of cases.

87% of children who were discharged among the sample of children identified for the evaluation. As depicted in Table 2, four change measures significantly ($p < .05$) contribute to the predictive power of the model. The model was most sensitive to a change in the strength of the family relationship. The probability of a successful discharge from CYICM (i.e., where treatment goals are accomplished) is .93 for children in families where family relationships strengthen between enrollment and discharge. For children in families where relationships weaken, the probability of success diminishes to .29. Other significant contributors to the model were changes in the child's status in functioning status, level of symptomatology, and age at admission. Table 1 summarizes the impact of a shift in each of these measures on the highest probability of successful discharge yielded by the model.

DISCUSSION

The data presented in this article are supportive of the positive outcomes associated with intensive case management for children with SED. In general, enrollees experienced positive outcomes such as a decrease in symptoms and improved functioning. Also, CYICM has been associated with fewer hospitalizations in state-operated psychiatric centers following enrollment in CYICM. This translates into cost savings and the possibility of reductions in the number of beds, important outcomes in these days of fiscal accountability in public-sector psychiatry.

The lessons learned from this evaluation go beyond these outcomes, however, and have led to refinements in our case management model. The data indicate that CYICM, a child-centered intervention, failed to impact caregiver needs and resources. It could be hypothesized that failure to impact the context in which the child is living and receiving care, including failure to provide support for families, could eventually result in eventual placement of children out of home in hospitals and residential settings. Additional study is needed of families of children enrolled in community-based programs.

One such study to further examine intensive case management in New York is now under way, with funding initially from the National Institute of Mental Health (1R18MH48072) and now from the Center for Mental Health Services (9HD5SM1338). Now in its final year, the project is comparing the child, family, and system outcomes obtained in an experimental study where children 6 to 13 years referred for placement in therapeutic foster care in three rural counties are randomly assigned to either treatment foster care or to Family-Centered Intensive Case Management (FCICM). FCICM, created specifically for the grant application, combines salient features of therapeutic foster care, such as respite care, with features of CYICM, such as flexible service money, and adds additional enhancements such as parent training in behavior management skills and the use of a parent advocate. The idea behind FCICM is to make the intervention family-centered, rather than child-centered, and to intensively support families caring for young children with SED. (6, 7).

Additional work on refining CYICM and on disseminating knowledge learned in the original research presented here has been submitted as a component of a proposed federally funded children's mental health services research center. This project will develop a training curriculum associated with an enhanced model of CYICM based on knowledge of best practices currently used by intensive case managers, as well as findings from research currently under way on CYICM in New York State. Issues associated with implementation of the enhanced CYICM program model will be identified and assessed as the model is actually established in two counties.

Finally, it is particularly important during the transition from fee-for-service reimbursement to managed care, particularly for the Medicaid population, to have a sound understanding of the outcomes related to community-based services for children and their families. Services that are not viewed as core mental health services, such as respite care and parent support, may not be included in the lists of services covered by managed mental health plans. Researchers need to make information available to key stakeholders, including individuals designing services, about the outcomes and costs associated with various services and also need to continue to study the outcomes experienced by children and families in managed care plans.

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