Chapter Nine

Information Systems and Outcomes Management

A Tale of Two Systems: Matching System-of-Care and Cambridge Health Alliance Data Sets

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Introduction

Efforts to improve the quality of child mental health services delivery require some capacity to measure results (American Psychiatric Association, 2003; Liptak, Burns, Davidson, & McAnarney, 1998). It would be ideal if there were linked data sets readily available for program developers and policy researchers to draw upon as needed in order to establish a baseline of current performance. Yet existing mental health service systems vary widely in the level of information they are required to collect, much of it not intended to capture quality at all but rather to support operations. Many child serving systems, such as education and child welfare, are not mental health settings at all, and therefore cannot supply diagnoses or standard measures of clinical functioning. In addition to these barriers, any information that is being collected by one entity, juvenile justice, for example, is virtually impossible to access by another, such as mental health. This means that, although there has been a consistent appeal for child mental health and substance abuse needs to be better addressed (Burns et al., 1995; Knitzer, Steinberg & Fleisch, 1993; Stroul, Pires & Armstrong, 2001), there is often inadequate information to inform and support quality management efforts (Bickman et al., 2000; Penner, 2000). Separate management information systems (MIS) and primary data collection tools do exist to track and monitor service utilization, clinical outcomes, consumer perspectives, and cost. However, individual service systems rarely employ all of these analyses and, even when they do, the information is often not designed to be integrated for use in continuous quality improvement or to measure system performance outcomes. The use of this process *across* agencies, stakeholders and purchasers, to contribute to evidence based decisions about resource distribution and policy, is seen as even less likely and a "blue sky" idea.

All of this leaves child and family system-of-care initiatives struggling for ways to define, record and evaluate their own performance so that quality improvement efforts can be supported and outcome comparisons with usual care can be made. The Massachusetts Mental Health Services Program for Youth (MHSPY) is a unique integrated system of care which provides medical, mental health, substance abuse and wraparound services. The MHSPY Mission is to:

> *Redesign health care delivery for the most vulnerable children and families using a strength-based, integrated system of care delivery. Our goal is to use the resulting improvement in outcomes and cost-effectiveness to increase access and quality of care for the broader population of children. (Sherwood, 1999).*

As part of internal quality control and external performance measurement, MHSPY sought to establish a reference point for interpreting enrollee service utilization, program process and outcomes information. Lacking the ideal, standardized community report on children's health described above, MHSPY turned to a neighboring system, Cambridge Health Alliance (CHA) for context. CHA is a respected, long established not-for-profit community hospital system providing comprehensive medical, mental health, and substance abuse services. It is located in the same two communities, Cambridge and Somerville, Massachusetts, where MHSPY operates.

In collaboration with CHA, we embarked on an investigation of utilization trends based on encounter information for a population of children similar to that within MHSPY. Recognizing that CHA claims information, being limited to services within a medical facility, would represent only a subset of the types of services which would be found in the MHSPY claims system, we conducted a chart review study to look for additional information about services a child might be receiving, as well as process of care and child/adolescent functional status indicators (see Table 1).

Table 1
System Service Types

Service Type	*CHA* *(Usual Care)*	*MHSPY*
Medical		
Inpatient Hospital	X	X
Ambulatory Surgery	X	X
Observation	X	X
Emergency Room	X	X
Specialty Care Visits	X	X
Pediatric Visits	X	X
Other Inpatient and Outpatient Services	X	X
Dental	X	X
Psychiatric	X	X
Inpatient Psychiatric	X	X
Outpatient Services	X	X
Acute Residential	X	
Pharmacy	X	X
Non-Traditional Services		
Care Coordination		X
Tracker		X
Mentor		X
Case Aide		X
Therapeutic After-School		X
Parent Partner/Family Advocate		X
Other Wraparound Services		X

Methods

Symmetrical administrative data requests were made to CHA and MHSPY, matched for children covered by Medicaid in the age range of 3-19 years, within Cambridge or Somerville, who had at least one mental health encounter (either outpatient or inpatient) between 3/1998- 3/2002. Data requests yielded claims for 134 CHA patients, and 100 MHSPY enrollees. All medical, mental health, substance abuse, and pharmacy claims were reviewed for diagnosis, cost and utilization information. Demographic information was gathered from the CHA encounter system and the MHSPY database.

A Chart Review Tool was constructed to review process of care and clinical information from both CHA and MHSPY medical records. The Chart Review Tool was developed by a team of MHSPY and CHA clinical research collaborators through a series of meetings over a period of nine months. It was deployed on laptops, so the chart reviewers could enter the information directly into an electronic format. The Chart Review Tool captures information regarding clinical status, service utilization, basic demographic data, and details of past medical, family, and social history, including Massachusetts state agency involvement. A unique numerical study ID exists on both the claims information and the chart review data. This allows linkage of the two data sources for each system. For both CHA and MHSPY populations, the utilization MIS data are supplemented by the clinical information contained in the chart reviews. (see Table 2).

Table 2
Data Elements of Each System

Data Elements	*CHA (Usual Care)*	*MHSPY*
Time Period	March 1998 - April 2002	March 1998 - October 2002
Communities:	Cambridge, Somerville	Cambridge, Somerville
Age	3-18	3-18
Number	134	100
Insurance Type	Medicaid	Medicaid
Demographics	Age, Gender, City of Residence, Language, Race/Ethnicity	Age, Gender, City of Residence, Language, Race/Ethnicity
Diagnosis	Yes	Yes
Eligibility / Enrollment	Yes	Yes
Claims - MIS Data	Medical, Mental Health, Substance Abuse, Pharmacy	Medical, Mental Health, Substance Abuse, Pharmacy
Authorizations - MIS Data	NO	Medical, Mental Health, Substance Abuse, Wraparound
Chart Reviews	YES	YES
Placement (Child's Living Situation)	If in chart notes	YES, tracked via weekly reports
Functional Measures	If in chart notes	YES

Analysis

Chart reviews for 100 MHSPY charts and 87 CHA charts have been completed to date. Table 3 displays sample characteristics of the children in both the CHA and MHSPY data sets. The MHSPY population appears slightly older, slightly more likely to be male, and somewhat more likely to be Spanish speaking, although differences are not significant. Frequency counts on the claims data were performed to capture overall system involvement for each child, as well as measurement of the distribution of service types used. In the CHA system, the average time subjects spend in care is 22.4 months and their mean number of mental health encounters is 13.5 times. For MHSPY, the mean length of enrollment was 19 months, with regular family and program contact several times a month.

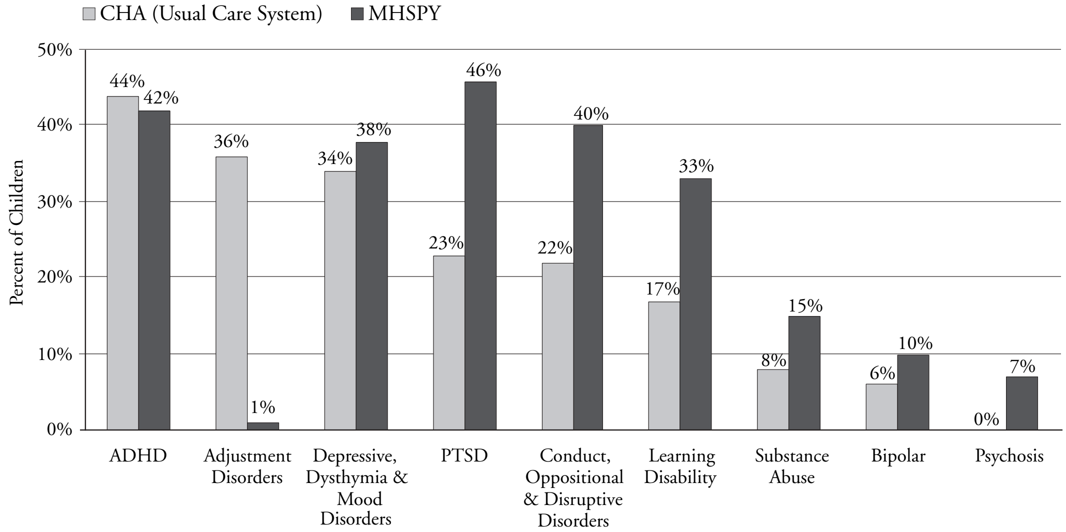
Preliminary analyses include frequency distributions of diagnosis. Figure 1 shows a comparison of the frequency of diagnosis among CHA system recipients and MHSPY enrollees. MHSPY children so far have similar rates of ADHD, twice the frequency of Post-Traumatic Stress Disorder, Substance Abuse, Conduct Disorders, and Learning Disabilities, higher rates of Depression and Bi-polar disorder, dramatically lower rates of adjustment disorder and higher rates of Psychosis than CHA children.

Service distribution comparisons indicate that CHA provides five major service types, with percentage distribution in dollars, as follows: inpatient psychiatry (60%), ambulatory mental health/substance abuse (14%), partial hospital (8%), pharmacy (1%), and medical care (17%). Pharmacy is inclusive only of those medications dispensed within the CHA system, and does not include prescriptions that may have been written by a CHA provider but dispensed at another pharmacy.

Table 3
Sample Characteristics

Characteritics	*CHA (Usual Care)*	*MHSPY*
Age		
Under 6 years	21%	15%
6 – 10 years	42%	41%
11 – 14 years	25%	30%
15 – 18 years	12%	14%
Gender		
Female	37%	28%
Male	63%	72%
Race/Ethnicity		
Caucasian	45%	43%
Hispanic Origin	18%	23%
African American	23%	21%
Asian	0%	2%
Native American	0%	0%
Other	9%	11%
Unknown	5%	0%
Primary language		
English Speaking	72%	63%
Spanish Speaking	17%	23%
Other	12%	14%
Medicaid	Yes	Yes

Figure 1
Comparison of the Frequency and Distribution of Diagnosis Among CHA System Recipients and MHSPY Enrollees



C.H.A. System – *N* = 87
MHSPY – *N*=100
Diagnoses unique to each system that are present in less than or equal to 3 children include:

- C.H.A. System: Obsessive Compulsive Disorder, Eating Disorders, Paranoid Schizophrenia, PDD, Anxiety Disorder, Separation Axiety, Mental Retardation, Reactive Attachment, Borderline Personality Disorder.
- MA-MHSPY: Obsessive Compulsive Disorder, Child Sexual Abuse, Anxiety Disorder, Asperger's, Agoraphobia, Mild MR, Separation Disorder, Panic Disorder, Selective Mutism, Seizures, Reactive Attachement Disorder, PDD, Tourette's Syndrome and Autism.

In contrast to usual care, MHSPY claims fall into 11 groups of major service categories. The MHSPY service distribution within the categories that match usual care are as follows: inpatient psychiatry (17%); traditional outpatient mental health (9%); day treatment/partial hospital (includes therapeutic after-school, for a combined 17%); pharmacy (8%); and medical care(5%). Non-traditional services make up the remaining half of MHSPY claims and include: family support (12%), acute residential/out of home respite (2%), transportation (5%), tracking/mentor/case aide/outreach counselor (14%), recreation (6%), and other wraparound funds (5%). Pharmacy expenditures are inclusive of all prescriptions for MHSPY members.

Discussion

Preferably, all mental health service delivery system outcomes would be standardized and easily accessible. The reality, however, is that even among usual care settings, clinical data elements are not standardized (Noser, 2000). Consistency of data elements would support quality improvement processes and information sharing. Creation of the Chart Review Tool took several iterations as we attempted to create one instrument for two systems. Much of what clinicians would want to know regarding quality of care is not routinely documented. In addition, the primary function of the MIS data system is to collect information relevant to operations and reimbursement rather than to address appropriateness or outcomes of care. Unlike research settings or demonstration projects, end-points in usual care are often unclear regarding degree of improvement and/or whether treatment goals have been met. These are among the barriers for performance measurement across systems-of-care and usual care sites.

This study was an initial attempt to assemble descriptive data from the CHA claims and chart review analyses and create a community based reference data set to further better understanding of MHSPY results. At this point in the investigation, it is apparent that detail regarding goals of treatment, processes of care and interventions outside of the traditional mental health realm are more visible in the system-of-care records than in the CHA records. The next phase of the study will be extremely valuable as the results of the chart review analysis are linked to the administrative data-sets for both systems. As others have found (Cassidy, Marsh, Holleran, & Rule, 2002; May, 1988), and as time-consuming and laborious as they are, the greater depth of information to be gathered from the chart reviews is valuable. In this case, gathering this information has been necessary for supplementary information regarding both the populations and the treatment process as we look to develop more efficient ways of evaluating quality in integrated systems of care.

References

American Psychiatric Association (2003). *Quality indicators: Defining and measuring quality in psychiatric care for adults and children*. Washington DC: Author.

Bickman L., Rosof-Williams, J., Salzer M. S., Summerfelt, W. T., Noser, K., Wilson, S. J., & Karver, M. S. (2000). What information do clinicians value for monitoring adolescent client progress and outcomes? *Professional Psychology – Research & Practice*, *31*(1), 70-74.

Burns, B. J., Costello, E. J., Angold, A., Tweed, D., Stangl, D., Farmer, E. M., & Erkanli, A. (1995). Children's mental health service use across service sectors. *Health Affairs* (Millwood), *14*, 147-159.

Cassidy, L. D., Marsh G. M., Holleran, M. K. & Ruhl, L. S. (2002). Methodology to improve data quality from chart review in the managed care setting. *American Journal of Managed Care*, *8*(9), 787-793.

Knitzer, J., Steinberg, Z., & Fleisch, B. (1993). *At the schoolhouse door: An examination of programs and policies for children with behavioral and emotional problems.* New York: Bank Street College of Education.

Liptak, G. S., Burns, C. M. Davidson, P. W., & McAnarney, E. R. (1998). Effects of providing comprehensive ambulatory services to children with chronic conditions. *Archives of Pediatric and Adolescent Medicine, 152*, 1003-8.

May, P. A. (1988). Mental health and alcohol abuse indicators in the Albuquerque area of Indian Health Service: An exploratory chart review. *American Indian & Alaska Native Mental Health Research*, *2*(1), 33-46.

Noser, K. & Bickman, L. (2000). Quality indicators of children's mental health services: Do they predict improved client outcomes? *Journal of Emotional & Behavioral Disorders*, *8*(1), 9-18, 26.

Penner, S. J. (2000). The role of the managed care organization in ensuring quality of the service system. In G. Stricker, W. G. Troy, & S. A. Shueman (Eds.), *Handbook of quality management in behavioral health*. New York: Kluwer Academic/Plenum Publishers.

Sherwood, E. (1999). Final Grant Report to the Commonwealth of Massachusetts, Executive Office of Health and Human Services, Division of Medical Assistance: Mental Health Services Program for Youth Replication. Grant #028828, March 1, 1996-March, 31, 1997 (April 1, 1997-June 30, 1999).

Stroul, B. A., Pires, S. A., & Armstrong, M. I. (2001). *Health care reform tracking project: Tracking state health care reforms as they affect children and adolescents with behavioral health disorders and their families – 2000 State Survey.* Tampa, FL: Research and Training Center for Children's Mental Health, Department of Child and Family Studies, Division of State and Local Support, Louis de la Parte Florida Mental Health Institute, University of South Florida.

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Examining the Impact of an Integrated System-of-Care on Medical Utilization

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Introduction

Past efforts to demonstrate cost-effectiveness of specialized systems of care for children with emotional disturbance have been fraught with difficulties. Problems encountered have included inconsistencies in defining the intervention, lack of standardization in both outcome measures and financial methodologies between systems of care (Behar, 1997; Langmeyer, 1997), and insufficient scope to address questions of cost shifting or add on costs (Bickman, 1996; Frank, McGuire, Normand & Goldman, 1999). The recent trend toward greater accountability for cost and service delivery, in both public and private settings, is beneficial in that more information is available for study (Dorfman, 2002; Duckworth & Hanson, 2002; Foster & Bickman, 2000). Where once we had as little an idea of what we paid for children's mental health as we did what children received, we are now much better able to answer both questions in most systems. Still, even crisper definitions of service types and easier access to outcomes information from public spending would be desirable (England, 1999; U.S. Department of Health and Human Services, 1999).

An additional challenge for system-of-care evaluations, however, consists of demonstrating associations between non-mental health interventions and improvements in mental health outcomes. Purchasers ask about the degree to which, for example, a wraparound approach prevented unnecessary hospitalizations or the extent to which a partnership with child welfare supports a child remaining in his home. While further study at the level of the individual is necessary to answer these questions, demonstrable impacts on populations help address the validity of an overall effect. The integrated Massachusetts Mental Health Services Program for Youth (MHSPY; Grimes, 2001), which combines primary care, mental health, substance abuse, education, juvenile justice and social services, is attempting to assemble such population information. Due to the inclusion of medical care in the model, MHSPY is unique in that it also offers the opportunity to assess cost-effectiveness of systems of care via the principle of *medical cost offset* (Olfson, Sing & Schlesinger, 1999).

Medical cost offset analysis refers to the measurement of utilization of services not only in mental health and substance abuse, but across the entirety of the medical care service delivery system. This is used to determine whether there were reductions in expected pediatric care costs, for example, as a consequence of appropriate treatment for mental health and/or substance abuse issues. In this study, a preliminary look at the possibility of medical cost offset has been undertaken via measurement of four markers of medical expense: pediatric primary and specialty visits, psychiatric hospital use, emergency room (ER) use and psychopharmaceutical use.

Methods

MHSPY is housed within a non-profit managed care organization (MCO), Neighborhood Health Plan (NHP), which has approximately 140,000 members in total, 70% of whom are Medicaid recipients. All MHSPY members are insured by Medicaid. A MHSPY program identifier exists, allowing the identification of all services for MHSPY members versus other NHP members.

Primary and specialty care use was identified by extracting paid claims having an outpatient visit procedure code to a medical doctor; those claims with a mental health related procedure code were excluded from these analyses. Claims for primary and specialty care visits for the MHSPY sample were measured, as were claims for 3-19 year olds in the non-MHSPY populations of: 1) *RC1* or Medicaid standard, 2) *RC2* or Medicaid-SSI Eligible, and 3) the Commercially insured.

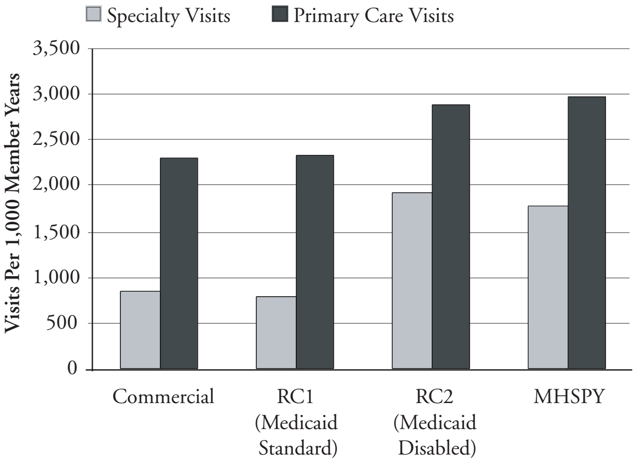
Emergency room visits, described as visits/1000 member years over a two year period, were also reviewed for the MHSPY sample and the non-MHSPY MCO populations described above by extracting paid claims having an ER procedure code, which were not part of an inpatient stay, ambulatory surgery visit, or an observation room stay.

Pharmacy claims, including psychotropic medication, for enrollees 3-19 years old were extracted for the same two year period for a slightly different version of the same four populations. Due to the restrictiveness of eligibility into the MHSPY program based on high baseline measures for psychiatric impairment, an approximate *reference population* within the MCO was created. The three non-MHSPY MCO populations described above were sampled for those children, ages 3-19, who had at least one night in a psychiatric hospital during the two year period of analysis. Results are described as a percentage of the children in each population having: 1, 2, 3 or 4+ prescriptions of any kind and of type of psychotropic medication.

Analysis/Results

Primary and specialty care medical use includes all non-mental health related procedure codes for outpatient visits regardless of diagnosis. The results, calculated as visits per 1,000 member years, indicate that Commercial and Medicaid Standard primary and specialty care visit counts were comparable, while MHSPY and Medicaid Disabled primary and specialty care visit counts were comparable (see Figure 1).

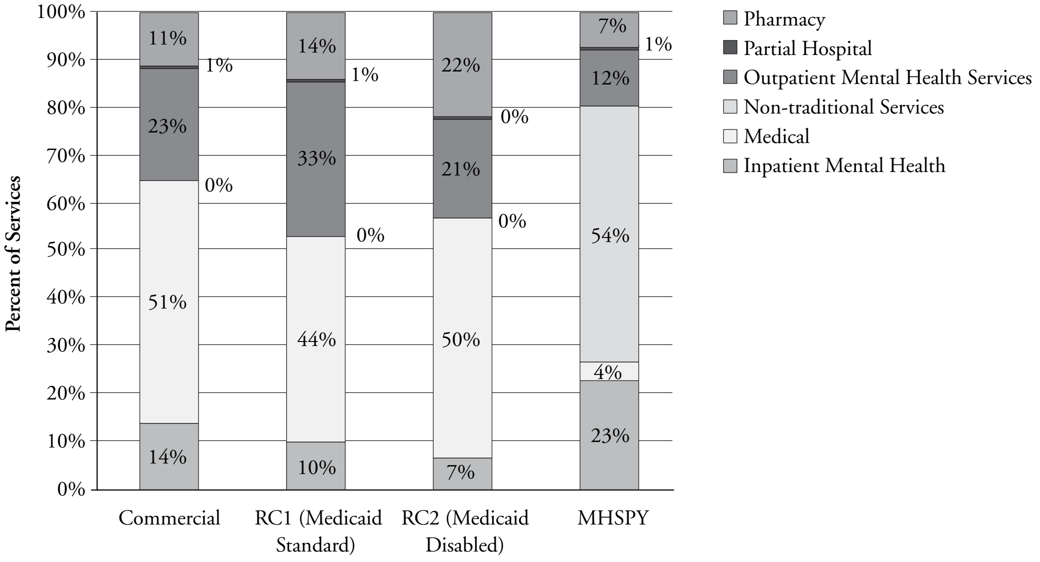
Figure 1
Primary and Specialty Care Pediatric Medical Visits
MHSPY vs. HMO



Dates of service January 2000 – December 2002.

MHSPY utilization was compared to all MCO children ages 3-19 with a mental health encounter (see Figure 2). Inpatient psychiatry use was higher for MHSPY than any other population; medical costs in MHSPY were significantly lower than those for other populations; pharmacy and traditional mental health services were lowest for MHSPY as compared to all other categories. In addition, only MHSPY provided non-traditional services to the youth.

Figure 2
Distribution of Clinical Service Types
(by U.S. Dollars) MHSPY vs. HMO



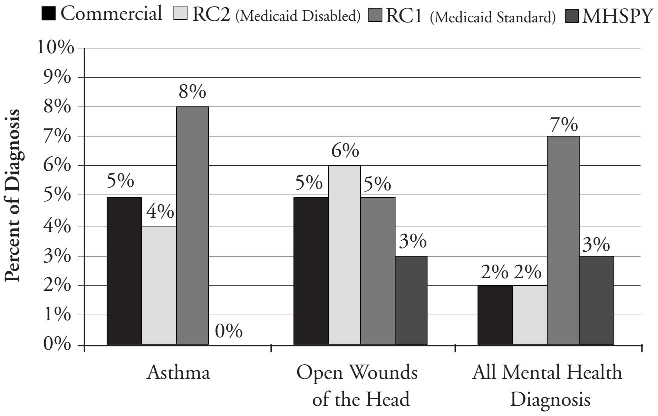
Dates of service October 2001- September 2002.

Annualized ER visits per 1000 members over two years, irrespective of reason or diagnosis, for the various populations studied were:

- Medicaid Standard = 411
- Medicaid Disabled = 619
- Commercially Insured = 294
- MHSPY = 318.3

The two leading reasons for ER visits for the total NHP population were asthma and head injury. MHSPY had no visits for asthma and the lowest rates for head injury. Remarkably, MHSPY members, eligible due to serious emotional disorders, have only slightly more emergency room visits than Commercial and Medicaid Standard for mental health reasons, and *half* as many as the medically disabled (see Figure 3).

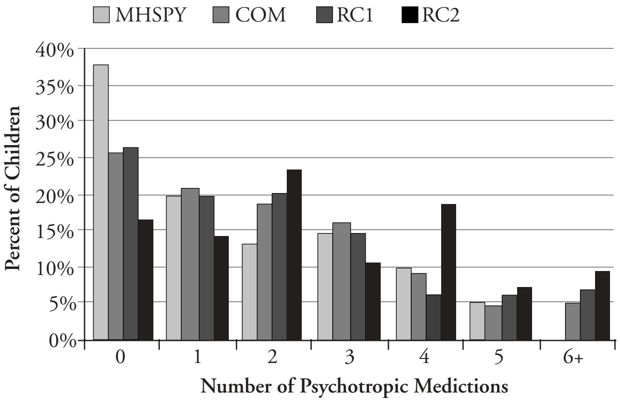
Figure 3
Distribution of Emergency Room Diagnoses*
MHSPY vs. HMO



* Physical health diagnosis from 89% of total diagnoses for Commercial, 98% for RC1, 93% for RC2 and 97% for MHSPY. Of those, the most frequent are asthma and head trauma for all categories except MHSPY. MH diagnoses displayed for all rating categories as percent of total. Dates of service are October 1999 - September 2002.

Pharmacy overall, and psychotropic medications alone, were captured as the number of unique drug types per person (see Figure 4). More than twice as many MHSPY children were on no medications, compared to each of the other three populations, including commercially insured children. MHSPY children were 20% less likely than the Commercial and Medicaid standard population to be prescribed four or more psychotropic medications and 58% less likely than the Medicaid-Disabled population to receive four or more psychotropic medications.

Figure 4
Percent of Children by Number of Psychotropic Medications Prescribed



* *Note:* Comparison population is children 3-18 who have had a mental health hospitalization in the given period.
Pharmacy data are for the period January 1, 2000 - April 30, 2002.

Discussion

Despite eligibility criteria that require evidence of serious emotional disability and long-term impairment, and the predictable increased medical vulnerability that often accompanies such status (Briggs-Gowan, 2000), the MHSPY program rates of ER, inpatient psychiatry and psychopharmaceutical use were lower than expected and compared favorably to the other three populations. Given that rapidly increasing emergency room and pharmacy costs are credited for being major factors in the escalation of health care costs overall (Goldman, 1999; Mulligan, 2002), it is important to revisit the concept of medical cost offset. It appears that there may be enhanced positive impact on medical utilization via integrated systems-of-care that is derived from intense clinical care coordination and partnership with the family. While outpatient medical contacts are increased compared to the Medicaid standard population, emergency room, hospital and medication use appears to decrease. This has implications not only for cost but for overall health outcomes. It would be of great interest to extend this investigation and collect detailed information on pediatric encounters, including diagnoses; as well as to conduct further analyses of the data reported here in order to assess replicability and transportability of the findings.

References

Behar, L. B. (1997). The Fort Bragg evaluation: A snapshot in time. *American Psychologist, 52*, 557-559.

Bickman, L. (1996). A continuum of care: More is not always better. *American Psychologist, 51*, 689-701.

Briggs-Gowan, M. J. (2000). Mental health in pediatric settings: Distribution of disorders and factors related to service use. *Journal of the American Academy of Child and Adolescent Psychiatry, 39*(7), 841-849.

Dorfman, S. L. & Smith, S. A. (2002). Preventive mental health and substance abuse programs and services in managed care. *Journal of Behavioral Health Services & Research, 29*(3), 233-258.

Duckworth, K. & Hanson, A. (2002). Using a clinical and evidence-based strategy to preserve access to psychiatric medications. *Psychiatric Services, 53*(10), 1231-1232.

England, M.J. (1999). Capturing mental health cost offsets. *Health Affairs, 18*(2), 91-93.

Foster, M. E. & Bickman, L. (2000). Refining the costs analyses of the Fort Bragg evaluation: The impact of cost offset and cost shifting. *Mental Health Services Research, 2*(1), 13-25.

Frank, R. F., McGuire, T. G., Normand, S. T., & Goldman, H. H. (1999). The value of mental health care at the system level: The case of treating depression. *Health Affairs, 18*(5), 71-88.

Goldman, H. H. (1999). Justifying mental health care costs. *Health Affairs, 18*(2), 94-95.

Grimes, K. E. (2001). Massachusetts – mental health services program for youth: A blended funding model for integrated care. In Newman, C., Liberton, C., Kutash, K., & Friedman, R.M. (Eds.). *The 13th Annual Research Conference Proceedings, A System of Care for Children's Mental Health: Expanding the Research Base* (pp 109-111). Tampa: University of South Florida, The Louis de la Parte Florida Mental Health Institute, Research and Training Center for Children's Mental Health.

Langmeyer, D. L. (1997). Cost control and the Fort Bragg project: Does a continuum of care have to cost more? In S. A. Pires (Ed.), *Lessons learned from the Fort Bragg Demonstration* (pp. 91-100). Tampa, FL: University of South Florida, Research and Training Center for Children's Mental Health.

Mulligan, K (2002, October). Psychiatric care threatened as states seek Medicaid cuts. *Psychiatric News, 18*, 4.

Olfson, M., Sing, M., & Schlesinger H. H. (1999). Mental health/medical care cost offsets: Opportunities for managed care. *Health Affairs, 18* (2), 79-90.

U.S. Department of Health and Human Services. (1999). *Mental Health: A Report of the Surgeon General.* Rockville, MD: U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services, National Institutes of Health, National Institute of Mental Health.

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Utilization of Mental Health Services by U.S. Children, 2001

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Introduction

Mental health services research has often relied on small studies, using data gathered from clinics that do not represent the U. S. population (Dulcan, 1996). As stated in the U. S. Surgeon General's Report on Mental Health, nationally representative data are needed to examine patterns of utilization of mental health services in the U. S. population (U. S. Department of Health and Human Services, 1999). The questions on the use of mental health services in the 2001 National Health Interview Survey (NHIS), conducted by NCHS, Centers for Disease Control and Prevention, provide an opportunity to explore the utilization of mental health services with a nationally representative sample of children. The NHIS is an annual household survey that collects data on health conditions, access to and utilization of health services, health insurance status, health behaviors, socio-demographic variables, and other health related topics. This summary explores new national data on mental health services used by children, examines the use of mental health services by children with Attention Deficit Hyperactivity Disorder (ADHD) and learning disabilities (LD), and examines differences in the use of mental health services by children according to their socio-demographic characteristics.

Method

The NHIS interview is conducted using a laptop computer and lasts about one hour. Households were selected using a complex, multistage design to represent the civilian non-institutionalized population of the United States. Approximately 39,000 households were included in the 2001 sample. Black and Hispanic populations were over-sampled to increase the reliability of national estimates for these populations. The NHIS consists of several questionnaires: a Family Questionnaire that asks questions about everyone in the family, a Sample Adult Questionnaire that collects more detailed information from a randomly-selected adult in the family, and, if there are children in the family, and a Sample Child Questionnaire that obtains additional data on one randomly-selected child. In addition, supplements on special health topics may be added. We added questions about Special Education services and contact with a general doctor due to an emotional or behavioral problem[1].

The data used for this analysis are from the 2001 NHIS Sample Child File. Because mental health problems are often difficult to detect in younger children, the analysis was limited to the 10,362 children who were 4 to 17 years of age at the time of the study. For the Sample Child Questionnaire, a knowledgeable adult, usually the mother, responded for the child. The final response rate for the 2001 Sample Child Questionnaire was 81%, and 92% for participating households (National Center for Health Statistics, 2001).

The questions used to define mental health services were designed in collaboration with the Center for Mental Health Services (CMHS) and the National Institute of Mental Health (NIMH). A child was considered to have had or used these services if the knowledgeable adult or parent responded yes to questions about the following variables:

- Contact with a mental health professional during the past 12 months. A mental health professional was defined as a psychiatrist, psychologist, psychiatric nurse, or clinical social worker. It is important to note, however, that contact with a mental health professional does not necessarily imply treatment. Contact with a general doctor, such as a pediatrician, for an emotional or behavioral problem.

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[1] *Questionnaires, interviewer instructions, documentation, and reports are available on the NCHS Web site at www.cdc.gov/nchs/nhis.htm.*

- Receiving Special Education services for an emotional or behavioral problem.
- Taking prescription medicine for at least three months. While the use of prescription medicine is often an integral part of a child's treatment for mental health problems, the 2001 NHIS does not ask why the child is taking prescription medicine.

The mental health conditions examined included Attention Deficit Hyperactivity Disorder (ADHD) and Learning Disabilities (LD). ADHD was defined as a response of yes to, *Has a doctor or other health professional ever told you that (child's name) had Attention Deficit Hyperactivity Disorder (ADHD) or Attention Deficit Disorder (ADD)?* LD was defined as a positive response to, *Has a representative from a school or health professional ever told you that (child's name) had a learning disability?*

The other variables examined were age (ages 4-11, and 12-17); race/ethnicity (Non-Hispanic White, Non-Hispanic Black, and Hispanic); the level of the mother's education (<12 years, 12 years, >12 years); family structure (both parents, mother-only); family income (<$20,000, ≥ $20,000), and health insurance status (insured, uninsured). Family structure was limited to two categories, both parents and mother-only; this was decided because the data for other types of family structure were too sparse for the estimates to meet the NCHS standard for reliability and precision (relative standard error less than 30%).

Missing data have been excluded from this analysis. Missing data accounted for 3% or less of all variables except income. Missing data for income was 5%. All estimates and associated standard errors in this study were generated using SUDAAN (Shah Barnwell, & Bieler, 1997). All differences discussed were compared using two-sided *t*-tests at the .05 level. Since these data are cross-sectional, they can not be used to determine causality.

Results

Contact with a mental health professional. In 2001 almost 4 million children 4-17 years of age (6.6%) had a contact with a mental health professional in the past 12 months (Table 1). Non-Hispanic white children were more likely to have had a contact with a mental health professional (7.9%) than non-Hispanic Black children (4.6%) or Hispanic children (3.8%). Children living in mother-only families were almost twice as likely to have had a contact with a mental health professional as children living with both parents. Children with health insurance had a contact with a mental health professional at about twice the rate of uninsured children.

Contact with a general doctor for an emotional or behavioral problem. Nearly 5% of children had a contact with a general doctor about an emotional or behavioral problem. Boys (5.6%) were more likely than girls (4.1%) to have had this contact. Children living in mother-only families were also more likely to have had a contact with a general doctor about an emotional or behavioral problem (7.2%) than children living with both parents (4.1%). Children with health insurance were more likely to have had a contact (5.1%) than children without insurance (3.0%).

Received special education services for an emotional or behavioral problem. About 2% of children received Special Education services due to an emotional or behavioral problem. The percent of boys who received services for this reason was almost three times the percent of girls. Children living in a mother-only family were more likely to have received Special Education services due to an emotional or behavioral problem (4.0%) than children living with both parents (1.5%). Children in families with an income of less than $20,000 per year received these services at about twice the rate of children in families with a higher income.

Took prescription medicine for at least three months. About 13% of children were taking prescription medicine regularly for at least three months, boys (15.4%) more than girls (11.3%), and youth 12-17 years of age (16.3%) more than children 4-11 years of age (11.2%). Hispanic children were on

Table 1
Percent of U. S. Children Ages 4 to 17
Who Utilized Selected Mental Health Services and Other Special Services, By Selected Demographic Variables[1-3]

Selected demographic characteristic	*Contact with a mental health professional*		*Contact with a general doctor for emotional problem*		*Received Special Education Services for an emotional problem*		*Took prescription medicine for at least 3 months*	
Total	6.6	(0.29)	4.6	(0.34)	2.3	(2.24)	13.4	(0.42)
Sex								
Boys	7.2	(0.40)	5.6	(0.38)	3.3	(0.29)	15.4	(0.61)
Girls	6.1	(0.40)	4.1	(0.36)	1.2	(0.21)	11.3	(0.51)
Age								
4 to 11	5.5	(0.34)	4.7	(0.32)	2.1	(0.23)	11.2	(0.47)
12 to 17	8.2	(0.51)	5.1	(0.43)	2.5	(0.29)	16.3	(0.72)
Race/ethnicity								
Non-Hispanic white	7.9	(0.39)	5.2	(0.33)	2.2	(0.22)	15.7	(0.58)
Non-Hispanic black	4.6	(0.55)	4.7	(0.63)	3.1	(0.50)	11.5	(0.88)
Hispanic	3.8	(0.39)	3.7	(0.48)	1.8	(0.32)	7.1	(0.59)
Mother's education								
Less than 12 years	3.5	(0.51)	4.2	(0.62)	2.3	(0.43)	7.9	(0.87)
12 years	6.7	(0.60)	4.9	(0.52)	2.6	(0.38)	13.5	(0.78)
More than 12 years	7.3	(0.39)	5.0	(0.35)	1.8	(0.25)	15.2	(0.63)
Family structure[4]								
Both parents	5.5	(0.32)	4.1	(0.30)	1.5	(0.20)	13.0	(0.51)
Mother-only	9.6	(0.70)	7.2	(0.61)	4.0	(0.47)	15.1	(0.91)
Income								
Less than $20,000	7.3	(0.74)	6.7	(0.70)	4.1	(0.52)	13.4	(0.98)
$20,000 or more	6.7	(0.31)	4.6	(0.29)	2.0	(0.21)	13.6	(0.48)
Health insurance								
Have insurance	7.0	(0.32)	5.1	(0.28)	2.3	(0.20)	14.3	(0.46)
Have no insurance	3.6	(0.63)	3.0	(0.57)	1.9	(0.53)	6.7	(0.88)

Data source: 2001 National Health Interview Survey (NHIS)

[1] Standard errors are shown in parentheses.

[2] Missing data have been excluded from this analysis

[3] A child may be counted in more than one column.

[4] Other types of family structure are not shown because the numbers were too small to meet the NCHS standards for reliability and precision.

prescription medicine at about one-half the rate of Non-Hispanic white children. There were also significant differences in the use of prescription medicine by mother's education, family structure, and health insurance status.

ADHD & LD. In 2001 about 6.3% of children had ADHD. As shown in Figure 1, children with ADHD used mental health services at a far greater rate than children without ADHD. About 7.7% of children have LD. Compared to other children, children with LD had a much higher use of mental health services (Figure 2).

Figure 1
Percent Of Children Ages 4 to 17 Who Utilized Selected Mental Health and Other Special Services, By ADHD Status

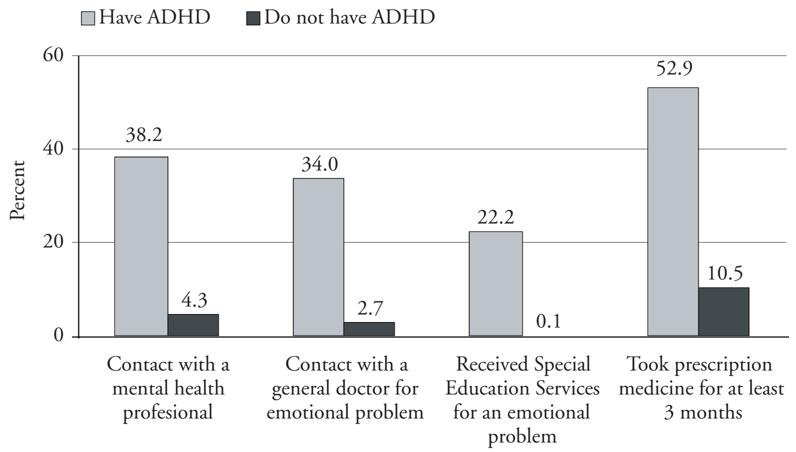
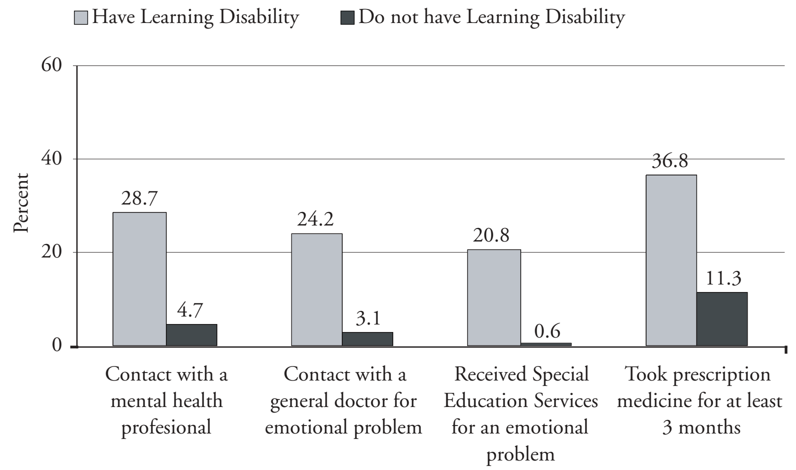


Figure 2
Percent Of Children Ages 4 to 17 Who Utilized Selected Mental Health and Other Special Services, By Learning Disability Status



Data source: 2001 National Health Interview Survey

Summary

This study presented data on children’s use of mental health services using new questions in the NHIS (i.e., Special Education services due to an emotional or behavioral problem and contact with a general doctor due to an emotional or behavioral problem) and previously used questions (i.e., contact with a mental health professional and the use of prescription medicine). This analysis found significant relationships between socio-demographic variables and children’s use of selected mental health services. This study also reported higher rates of service use among children with ADHD and LD compared with other children. Results for the previously used questions are consistent with similar analyses using NHIS data (Simpson, Scott, Henderson, & Mandersheid, in press; Bloom & Tonthat, 2002; Blackwell & Tonthat, 2002; Pastor & Reuben, 2002).

References

Blackwell, D. & Tonthat, L. (2002). Summary health statistics for U. S. Children: National Health Interview Survey, 1998. *Vital Health Statistics, 10*(208), 3-12.

Bloom B., & Tonthat, L. (2002). Summary health statistics for U. S. Children: National Health Interview Survey, 1997. *Vital Health Statistics, 10*(203), 1-10, 43-46.

Dulcan, M. K. (1996). Introduction: Epidemiology of child and adolescent disorders. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35(7), 852-854.

National Center for Health Statistics (2001). *Data File Documentation, National Health Interview Survey, 2001*. Retrieved from: *www.cdc.gov/nchs/nhis.htm*). Pastor, C. N., & Reuben, C. A. (2002). Attention Deficit Disorder and Learning Disability: United States, 1997-1998. *Vital Health Statistics*. 10(206), 1-10.

Shah B. V., Barnwell B. G., & Bieler, G. S. (1997). *SUDAAN User's manual: Software for analysis of correlated data, Release 7.5*. Research Triangle Park, NC: Research Triangle Institute.

Simpson, G., Scott, G., Henderson, M., & Mandersheid, R. (in press). Estimates of attention, cognitive and emotional problems, and health service use by US school aged children. Chapter in *Mental Health U. S., 2002*.

U.S. Department of Health and Human Services. (1999). *Mental Health: A Report of the Surgeon General*. Rockville, MD: U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services, National Institutes of Health, National Institute of Mental Health.

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Brief Symposium

Need for Evidence Supported Treatments: Findings from a Statewide Database

Chair
Kay Hodges

Authors
Weller et al.
Wale et al.

Introduction

Kay Hodges

A state database of outcomes for youths served by providers in the public mental health sector over the past four years has been a rich source of information to help guide the state in deciding what types of evidence-supported treatments (EST) are most needed. In addition, the use of these data to provide timely feedback on outcomes to participating providers has generated a keen interest in ESTs among practitioners.

Two of the studies generated from this state-based dataset are presented. One use of this dataset has been to identify programs that appear to have exemplary outcomes. Weller and colleagues present data on a community-based program that offers home-based treatment for youths with serious emotional disturbance who are at risk for out-of-home placement. Severity of impairment at intake and outcome after treatment are presented for the program as well as for the state-based dataset. The second study by Wale and colleagues evaluates an assessment protocol developed for determining whether youths require immediate hospitalization when presenting to an emergency room with a psychiatric crisis. Analyses were conducted to determine whether the Child and Adolescent Functional Assessment Scale (CAFAS; Hodges, 2000) scores differed for youth whose final disposition was immediate hospitalization compared to those who received a disposition for less intensive services. Feedback from staff on efficiency, time savings, and receptivity by consumers is also reported.

References

Hodges, K. (2000). *Child and Adolescent Functional Assessment Scale.* Ypsilanti, MI: Eastern Michigan University.

Identification of Locally Developed, Effective Programs: A Community-Based Intervention for Highly Impaired Youth

Joyce Weller, Char Beedle, Carol Epple, Al Way, Mengli Song, & Heidi Grunwald

Introduction

The availability of outcomes statistics for a state-based data set in Michigan has permitted the identification of programs among state providers that have exceptionally good outcomes. Two community mental health service providers are notable for their above average outcome results for each of the seven types of clients that have been studied (Hodges & Wotring, 2002). A historical fact, forgotten until these sites were contacted, was that one of the two sites had received intensive solution-focused training five years prior; and shortly afterwards that site provided extensive in-service training to the second site (Hodges & Wotring, in press).

This paper reports on the data for the program that conducted the original training in solution-focused therapy. This program, the Family Guidance Service (FGS), is a community-based intervention that provides a variety of services to youths who are at moderate or high risk for out-of-home placement. The basic components of the program include: (a) intensive and urgent home-based treatment, (b) a medication management clinic, (c) social/recreational services to develop the youths' interpersonal skills, (d) therapeutic respite services, and (e) emergency services. This program is situated in a large community mental health service provider that functions within a system of care and is well regarded in the state by family advocates.

The treatment philosophy of the FGS program includes many features that are thought to be important based on research and values in the field. Their articulated philosophy is: strength-based, family-centered and community involved, solution-oriented, and uses a cognitive behavioral approach. In addition, the program uses flexible dollars and converts hospital and residential dollars to community-based services. The personnel at FGS have characteristics that have been described as important in creating what Wagner et al. (2000) define as a "clinic culture," including an openness to peer supervision, flexibility, a willingness to be held accountable for data-oriented decisions, and a deep respect for the client's understanding of their own issues.

In this paper we present data to describe the types of clients seen in the FGS and the outcomes for these youths. In addition, the data for FGS are descriptively compared to the profile for the state database.

Method

Sample. The FGS sample included 151 youths, with a mean age of 12.4 years. The sample was comprised of 61.6% males. Over half of the youths were adolescents (56.3%) and the rest were pre-adolescents. Almost 60% (59.6%) lived in single parent homes, and 49% had a family income below the poverty level. The state dataset included 1376 youths, with a mean age of 11.5 years. The sample was comprised of 60.1% males and 39.5% adolescents, with 49.6% of the families headed by single parents and 43.4% with a family income below the poverty level.

Measures and Analysis. The measure of outcome is the Child and Adolescent Functional Assessment Scale (CAFAS; Hodges, 2000). The CAFAS contains eight subscales for rating the youths, each of which consist of a set of behavioral descriptors grouped into levels of impairment, which are assigned numerical values: Severe Impairment (30), Moderate Impairment (20), Mild Impairment (10), and No or Minimal Impairment (0). The CAFAS Caregiver: Family/Social Support subscale, which assesses the extent to which factors present in the youth's environment negatively impact the youth's functioning, is scored in a similar fashion. Therapists rated the youths at intake and quarterly thereafter, and at discharge from FGS. Descriptive percentages and means are presented for FGS and for the state database (see Table 1). Paired *t*-test analyses were conducted to compare the intake and last CAFAS score for the youths in the FGS program (see Table 2).

Results

Comparisons at Intake

Demographics. The demographic characteristics appear fairly comparable for the two samples except that FGS treated more adolescents and more single-parent families.

Risk factors. For each of the risk factors, more youths in FGS had risks in their histories, compared to the state sample. The rates for the following three risks were twice as high for FGS: previously hospitalized for psychiatric/substance use problems, previous placement outside the home, and previous involvement with juvenile justice. This is consistent with the mission of the FGS program to treat youth who have serious emotional disturbances (SED).

Caregiving environment. Almost twice as many caregiving environments were rated as severely or moderately impaired on the CAFAS Caregiver: Family/Social Supports subscale in the FGS sample (62.9%), compared to the state sample (34.4%).

Youth impairment at intake. Impairment at intake is presented from several perspectives: (a) Total CAFAS score at intake, (b) percent of youths who were severely impaired on one or more youth subscales of the CAFAS, and (c) average number of subscales rated as severely impaired (see Table 1). For each variable, the FGS sample had higher rates of impairment. The average CAFAS Total score for FGS was

124.7, compared to 76.0 for the state sample. More than twice as many FGS youths (88.1%) had at least one severe impairment, compared to the youths from the state database (39.9%). Almost all of the youths in FGS had at least one severe impairment, with an average of 2.1 impairments (compared to 0.7 for the state).

Table 1
Comparison of Profile for FGS and State

Characteristic	*Family Guidance Services (FGS)*	*State (excluding FGS)*
Demographic Characteristics		
Males (%)	61.6	60.1
Mean age	12.4	11.5
Preadolescents (%)	43.7	60.5
Caucasian (%) *	60.3	71.3
Family income =<$20,000 (%)	49.0	43.4
Home with 1 parent figure (%)	59.6	49.6
Risk Factors		
Previous hospitalization for psychiatric/substance use problems (%)	35.8	15.9
Previous placement outside the home (%)	41.7	22.1
Previous involvement with juvenile justice (%)	29.1	15.8
In state custody (child welfare) (%)	11.3	9.1
In state custody (juvenile justice) (%)	12.6	4.7
Caregiving Environment		
Caregivers severely or moderately impaired on CAFAS Caregiver subscale (%)	62.9	34.4
Impairment At Intake		
CAFAS total score at intake Mean (SD)	124.70 (31.24)	76 (35.73)
Median	120	70
Youths with 1 or more severe impairments (%)	88.1	39.9
Mean number of severe impairments	2.1	0.7
Breakdown by CAFAS subscales: % severely or moderately impaired		
School	84.1	57.5
Home	88.1	50.3
Community	41.7	16.0
Behavior Toward Others	88.7	55.3
Moods/Emotions	86.7	56.2
Self-Harmful Behavior	52.3	16.0
Substance Use	23.1	4.9
Thinking	10.6	6.4
Outcome Indicators For Youth (from intake to last CAFAS)		
Reduction of 20 points or more in CAFAS total score (%)	68.2	53.8
No Severe Impairments at last CAFAS (restricted to youths with 1 or more severe impairments) (%)	42.1	59.0
Outcome On Caregiver Scale		
Reduction from severe or moderate impairment to mild or no/minimal impairment on CAFAS Caregiver Scale (Restricted to caregivers with moderate or severe impairment at intake) (%)	29.0	29.7

Table 2
Difference from Intake to Last CAFAS
on Mean CAFAS Scores for CAFAS Subscales

CAFAS Subscale	*Intake CAFAS score*	*Last CAFAS score*	*t (df=150)*
School	23.44	18.01	5.44***
Home	24.77	17.56	8.53***
Community	11.99	8.54	3.59***
Behavior Toward Others	20.86	15.83	7.23***
Moods/Emotions	20.33	15.23	6.79***
Self-Harmful Behavior	12.85	3.84	10.12***
Substance Use	6.62	4.97	2.39*
Thinking	3.84	2.78	1.80

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

The percentage of youths rated as either moderately or severely impaired on each of the eight CAFAS youth subscales is also shown in Table 1. For the School, Home, Behavior Toward Others, and Moods/Emotions subscales, the percentages were in the 80s for FGS and in the 50s for the state data. In addition, the percentages were at least several times higher for FGS for three of the subscales: Community (indicating delinquency), Self-Harmful Behavior, and Substance Use.

Outcomes

Descriptive Comparison of FGS to State data. Results of two outcome indicators are also provided in Table 1. For the least ambitious criterion, which is reduction in CAFAS total score by 20 points or more, more youths in the FGS sample (68.2%) achieved the criterion, compared to youths in the state sample (53.8%). However, for a much more rigorous criterion, which is no severe impairments at last CAFAS (restricted to the subsample of youths with one or more severe impairments at intake), FGS (42.1%) did not perform as well as the state sample (59.0%). This would be expected given the difference in case mix, with the average FGS youth having more severe impairments. Also, FGS clients are discharged from the program when they are ready for less intensive services, such as outpatient. The FGS program (29.0%) had rates similar to the state (29.7%) for improvement in caregiving environment on the CAFAS Caregiver: Family/Social Support subscale.

Outcomes for FGS Sample only. There was a statistically significant reduction in impairment from intake to last CAFAS on the CAFAS total score ($t[150] = 11.85$, $p < .0001$), with a d statistic of .96. This represents a large effect size according to Cohen's (1988) criteria. The youths' scores changed almost one standard deviation. The results for each of the CAFAS youth subscales are presented in Table 2. All of the t-tests reached statistical significance except for the Thinking subscale. Thus, for all of the remaining domains, the youth's functioning improved significantly.

Discussion

Findings of this study show that the FGS program successfully reduced impairment scores among youths with serious emotional disturbance when compared with youth receiving usual care services.

Given the favorable outcome data observed for FGS, the Michigan Department of Community Health is encouraging the staff to develop a treatment manual and a measure of treatment adherence so that the program can be piloted at another provider site. If this pilot works well, the goal will be to seek funding to conduct a randomized controlled study (Wagner, Swenson, & Henggeler, 2000). The rationale is that there is no "magic bullet" treatment for youths with high levels of psychiatric disturbance and impairment who are at risk for out-of-home placement (Hoagwood, 2001). In addition, if further research documents that FGS is an effective treatment program, there are fewer concerns about generalizability of the intervention for youths in Michigan because it is a local program, compared to adopting a program developed outside of Michigan. Also, dissemination should be less complicated and risky given that FGS is local and geographically located in a convenient area of the state.

The most immediate goal for future research is propensity analysis (Rosenbaum & Rubin, 1983), which permits identifying a comparison group from among youths in the state database. This methodology will yield an equivalent group to FGS in terms of demographic variables and severity of impairment at intake. With the comparison group, analyses can be conducted to determine whether the outcomes for youth served by FGS are better than observed for similar youths with comparable degrees of impairment receiving customary care in other clinics in the state. If receiving treatment at FGS is associated with superior results, a study of variables postulated to be mediating variables can be undertaken.

References

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences.* (2nd Edition). Hillsdale, NJ: Lawrence Erlbaum Associates.

Hoagwood, K. (2001). Evidence-based practice in children's mental health services: What do we know? Why aren't we putting it to use? *Emotional & Behavioral Disorders in Youth, 1*(4), 84-87.

Hodges, K. (2000). *Child and Adolescent Functional Assessment Scale.* Ypsilanti, MI: Eastern Michigan University.

Hodges, K., & Wotring, J. (in press). *Role of monitoring quality of care in initiating implementation of evidence-based treatments at a state level.* Psychiatric Services.

Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of propensity score in observational studies for causal effects. *Biometrika, 70*(1), 41-55.

Wagner, E. F., Swenson, C. C., & Henggeler, S. W. (2000). Practical and methodological challenges in validating community-based interventions. *Children's Services: Social Policy, Research, and Practice, 3*(4), 211-231.

Evidence for Standardizing and Tracking Evaluations for Hospitalization in a Crisis Intervention Program

Heidi L. Wale, Lori Denter & Pamela R. Barckholtz

Introduction

This paper describes the procedures and findings relevant to implementing a new crisis assessment and intervention program for children presenting with a psychiatric emergency in Saginaw County, Michigan. The Saginaw County Community Mental Health Authority children's crisis unit is available to all residents and visitors on a walk-in basis during business hours. In the evening and on the weekends, the center utilizes a hospital emergency room for all crisis contacts, and a Master's level children's crisis clinician is available after hours via pager. Children presenting in the emergency room during the day due to medical complications such as overdose or injury are also seen by a children's crisis clinician.

The Michigan Department of Community Health has established specific criteria to determine hospitalization eligibility for Medicaid recipients. This criterion is used to assess all individuals seeking services at Saginaw County Community Mental Health regardless of insurance coverage. This criterion includes: presentation of psychiatric signs and symptoms, disruption of self-care, possibility of harm to self, possibility of harm to others, and the possibility of medication non-compliance. This criterion is not age-specific and does not include child specific issues.

After the initial assessment, which includes interviews with the client, parents or guardians and other significant persons involved, the clinician makes a determination for an appropriate disposition. When this service is provided in the hospital emergency room, it is standard procedure for the clinician to consult with the attending physician to gain support when making the disposition.

Prior to the inception of the new crisis evaluation process introduced in this study, clinicians were required to complete a lengthy crisis narrative assessment. This assessment was time consuming to complete, was composed of many issues not pertaining to the problem at hand and was prepared after the crisis was resolved, during office hours. Although the assessment interview and intervention procedures were conducted face-to-face with the client, actual documentation supporting the disposition was prepared *after* the fact; thus the assessment itself was of little help to the clinician during the decision making process. As a narrative, this assessment provided only anecdotal information to supervisors and administrators about the crisis and the resulting disposition made by the clinicians. In addition, this caused many time-related issues for clinicians who had been called out in the late hours of the evening, yet were required to return to work the following day to assume their daily client contacts and to complete paper work for crisis contacts from the previous evening.

Through a series of process improvement meetings, the staff and administrators identified and targeted the concerns about time constraints, subjectivity of assessment, and difficultly in communicating assessment results. A review of the literature revealed that there were no standard objective assessment instruments used for children and adolescents presenting with psychological crisis. The Child and Adolescent Functional Assessment Scale (CAFAS; Hodges, 2000) and a brief crisis progress note, which detailed time and location of assessment, mental status, presenting problem, diagnosis and disposition, were chosen to replace the prior assessment procedure. In addition to providing objective language determining severity of presenting symptoms and behaviors and for justifying decisions to invested parties, the CAFAS was selected because it provided a welcome reduction in paperwork for the clinician. Those involved in the process determined that all criteria from the Medicaid guidelines were reflected in the CAFAS.

The new process was implemented in March of 2002, with plans for periodic quality assurance and improvement review. Specifically, it was predicted that the new system would result in: (a) reduction in the amount of clinician time spent for each assessment, (b) hospitalized youth would have higher total CAFAS scores, and (c) hospitalized youth would have higher scores on specific CAFAS subscales relevant to Medicaid criteria (i.e., Home, Behavior Towards Others, Moods, Self-Harm, and Thinking). This paper reports the results of a review of this process one year after commencement.

Method

Sample. Completed CAFAS scores with corresponding dispositions were available for 137 clients at the time of this review. The sample had an average age of 14.1 years, and 56% were female (n = 77). The group was comprised of 24 African-American, two Arab-American, 84 Caucasian, five Hispanic, 10 Multi-racial and 12 clients for whom racial demographics were not documented. Upon disposition, 67 clients were psychiatrically hospitalized, 64 clients were referred to other services and six clients had a disposition that was not in either category (e.g. temporary placement with a relative outside of the home). Due to small numbers, data for clients with a disposition that was neither hospitalization nor referral (n = 6) were not included in the analyses.

Measures. On the CAFAS, a clinician rates a youth's behaviors for each of eight domains (School/Work, Home, Community, Behavior Towards Others, Moods, Self-Harm, Substance Use and Thinking) by the endorsement of specific items that describe a child's behavior or primarily observable symptoms. The CAFAS domains are ranked severe (30), moderate (20), mild (10), or minimal or no impairment (0). Information from any reliable source (e.g. the child, parent, clinician observation, teacher report) can be used by the clinician to score each domain. To utilize the CAFAS, each clinician completes reliability training to ensure conformity of scoring.

Procedures. Staff were trained in February 2002 regarding the new assessment process, which was then implemented March 1. All staff were required to complete CAFAS reliability training to fulfill their crisis duties. Following all assessments, the scored CAFAS was entered into the crisis database using the CAFAS Computer System, Version 5.0 (Hodges, 2001) and a code was included indicating the disposition of the intervention. Clinician time spent in each intervention was tracked by the agency's billing software. However, due to changes in the agency's billing protocols, pre- and post- measures of clinician time could not be analyzed for statistical significance. Instead, all crisis clinicians were surveyed on three *yes* or *no* questions: (1) The changes in the intake process saved time with paperwork and documentation; (2) The new system helped explain disposition decisions; and (3) They preferred the new system over the old.

Analyses. For dichotomous variables (i.e., sex, race, preadolescent vs. adolescent), chi-square analyses were conducted to test group differences between youths hospitalized and referred to other services. *T*-tests were done to examine differences between continuous scores (i.e., CAFAS scores, age).

Results

***Preliminary analyses*.** There were no significant differences between hospitalized and referred clients on sex, race, or proportion of adolescents. The mean age for both groups was 14 years.

Results for the CAFAS. As predicted, the mean total score was significantly higher for clients who were hospitalized for psychiatric treatment ($M = 126.52$), compared to the referred-to-other-services group ($M = 96.56$; $t = 4.46$, $p < .001$). Means differed by 30 points, medians also differed by 30 points and the mode was 50 points lower for referred clients.

As predicted, the specific scales identified as corresponding to Medicaid criteria were higher for hospitalized clients than the referred group. Results for *t*-tests were as follows: Home ($t = 2.39$, $p <. 05$), Behavior Towards Others ($t = 3.14$, $p < .01$), Mood ($t = 5.8$, $p <. 001$), Self-Harm ($t = 5.51$, $p < .001$), and Thinking ($t = 2.2$, $p = .05$). School was also statistically different between the groups ($t = 2.16$, $p = .05$). The only scales not related to hospitalization were Community ($t = -.25$, $p = .806$) and Substance Use ($t = -1.41$, $p = .161$), suggesting that CAFAS helps differentiate between mental illness and juvenile delinquency despite crisis presentation.

Clinician time. In response to the survey, crisis clinicians were unanimous in stating that the new crisis assessment system saved them time and was preferable over the old. Responses were split equally between those that felt the new system helped to explain disposition decisions and those who disagreed. Staff comments included concerns that emergency room physicians sometimes pressed clinicians to hospitalize rather than refer clients due to concerns about liability.

Discussion

This study was undertaken as a quality improvement process within an existing child and adolescent crisis assessment program. Goals were to decrease the amount of paperwork and time required for assessment completion by crisis clinicians, and to introduce objective, empirically supported assessment criteria for predicting necessity of hospitalization. The process review indicated all goals were met as predicted.

Implications for these results include decreased program costs with savings in cost of clinician time. CAFAS scales and subsequent scores were found to correspond to Michigan Medicaid criteria for crisis assessment, and its use was seen as related to improved consistency of disposition.

Additional value may be gained with follow-up information from attending physicians and consumers regarding satisfaction with the crisis process, their understanding of clinician's assessment and stability of dispositions over time. In-service training for attending physicians may promote better communication and understanding regarding issues of hospital diversion.

References

Hodges, K. (2000). *Child and Adolescent Functional Assessment Scale.* Ypsilanti, MI: Eastern Michigan University.

Hodges, K. (2001). *CAFAS Software: Version 5.0*. Ann Arbor, MI: Functional Assessment Systems.

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Symposium Overview

Taking Off the Rose-Colored Glasses – Understanding Treatment Failure Examining Patterns of Improvement and Non-Improvement

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Introduction

It is not realistic to expect that changes made to mental health service systems will ensure that all children with serious emotional disturbances will make the same treatment progress. Some children experience improvement over time, while others do not. This overview presents a profile of children treated in a system-of-care site who showed no improvement (i.e., on a reliable change index). The paper also highlights the importance of identifying a conceptual framework to anticipate potential treatment failure in order to address and to optimize outcomes for children facing more difficult challenges.

While some children in mental health service systems may recover, never needing services in the future, most children will likely encounter periods of fluctuating functioning, and times where support is needed to optimize functional status. Although some children experience improvement over time, others experience little if any improvement–that is–*treatment failure*. While treatment failure is noted in the research literature in comparison to those who improved as a result of treatment (Bugental, 1988; Lambert, Shapiro, Bergin, 1986), it is seldom the focus of the study, and is minimally addressed in terms of child treatment studies. Intervention outcomes are typically defined in terms of effectiveness and positive outcomes, while negative outcomes are seldom the target of interest. The emphasis on empirically supported treatments and treatment effectiveness has helped to obscure the importance of understanding treatment failure in order to avoid unfavorable outcomes.

For the purposes of this summary, treatment failure will be defined in terms of *no improvement* (deterioration and stability, no change) using the Edwards-Nunnally Confidence Interval as a method of establishing reliable change (Hsu, 1995, 1989; Nunnally & Kotsch, 1983; Speer 1992). Family, social and environmental circumstances and situations will be considered as plausible explanations for the less than favorable outcomes experienced by the children served by the system of care, as well as the treatment received. The focus of this paper is on the need for a conceptual framework for identifying potential treatment failure, and on the importance of a client-focused (Lambert, Hansen, & Finch, 2001) research agenda for children and families served by mental health systems. It is beyond the scope of this paper and the data that support it to identify robust predictors of treatment failure. Rather, our intention is to identify meaningful characteristics and conditions to investigate in order to better understand why some children experience no change or deterioration and others improve.

There are significant conceptual and methodological challenges in investigating treatment failure in a child/family system of care setting. The hallmark of the system of care is an individually tailored and flexible service array that includes formal/traditional services, wraparoundservices, and informal social supports that are child centered, family focused, culturally competent and community-based. It is by definition an approach that differs in response to the needs of the child and his/her family. This feature increases the difficulty in attributing the lack of child improvement to a specific treatment modality or component. To date there is no systematic taxonomy of system of care component that captures the nuances that characterize service systems that identify themselves as systems of care. For example, components that are unique to the Nashville Connection system of care include the interaction of family service coordinators (FSC) and school-based mental health liaisons (MHL), the activities of the child family teams (CFT), and services received and patterns of care (formal and informal).

In addition, the environmental situations and circumstances experienced by the families of children showing no initial improvement may help to explain this less than favorable outcome. For example, some family environments may be more conducive than others in terms of taking advantages of the services and supports that are offered by the system of care. A family troubled by adverse living conditions, and employment concerns may be distracted from maintaining a behavior management program at home. Support may be to ensure a family's readiness to implement a behavior management program for their child at home.

Method

Subjects

The 103 children and families represented in this study are participating in the evaluation of the Nashville Connection, a SAMHSA/CMHS funded system of care site. Table 1 presents the demographic breakdown for the youth participating in the evaluation. At the time of intake into the *Nashville Connection* eighty-eight percent of the children are living with a biological parent or relative. Children are most likely to be living in a mother-headed household. Mothers are most likely to have legal custody of the child (62%) even when the child is residing with a relative. Only four percent of the children were in residential treatment facilities, and one percent (1.4%) were in the custody of the state. Many of the caregivers of the *Nashville Connection* children report experiencing significant family challenges. Several of the caregivers report that the family has a history of mental illness (60%). Forty-five percent note previous psychiatric hospitalization. Substance abuse (60%) and felony conviction (58%) are also identified as challenges these families face. More than two-thirds (67%) of the *Nashville Connection* children live in families with two or more of these risk factors. Thirty-one percent of the children live in families with four or more risk factors. It is noteworthy that even with these risk factors and family challenges, 94 percent of the Nashville Connection children are living and receiving services and treatment in the community at the time of these analyses. At the time of this report, only five children (6%) are being cared for in specialized foster care or residential settings.

Table 1
Demographic Characteristics of Youth
(*N* = 103)

Age (mean)	10.9 years
Gender	
Male	71%
Female	25%
Race/Ethnicity	
African American	59%
Caucasian	20%
Other	10%
Missing	11%
Hispanic Origin	3%

All children served by the Nashville Connection have a diagnosis of a serious emotional disturbance (SED). Most children (71%) have multiple diagnoses. Fifty-seven percent of the children have two separate diagnoses; 15% have three or more. Attention deficit disorder with hyperactivity (ADHD) is the most commonly diagnosed disorder for the Nashville Connection children (49%), followed by bipolar disorder (23%). Only 2% of caregivers report problems related to their child's substance use; the low incidence is largely due to the age range of the Nashville Connection children (8 through 13 years of age).

Measures

In addition to demographic information, the following areas were assessed at baseline and across six-month follow-up intervals: emotional status and symptomatology using the Child behavior Checklist (CBCL; Achenbach & Edlebrock, 1991), Caregiver Strain Questionnaire (CSQ; Brannan, Heflinger, & Bickman, 1994), school performance (parent self-reports), child and family risk factors (parent/youth self report), and parent report of services received.

Procedures

Children were grouped into either improvement or no improvement groups based on reliable change as measured by the Edwards Nunnally Confidence Interval using the CBCL. The Edwards Nunnally Confidence Interval (EN) was used in favor of the more typically used Jacobson and Truax (1991) reliable change index to address the effects of regression to the mean. The sample size did not permit the use of HLM growth curve modeling, which makes use of the data at all levels across follow-up intervals, offering greater advantages than does the EN Confidence Interval method (Speer, 1992). Regression to the mean (CBCL baseline and six-month posttest scores) for this sample is estimated at approximately 60 percent. The EN method is a confidence interval consisting of two standard errors of measurement, centered on the child's baseline estimated true CBCL score. The true score is equal to the product of the measure's test-retest reliability and the child's initial obtained derivation score (obtained initial score minus the population mean). The confidence interval is centered on the estimated true score and the follow-up score is located relative to this interval. The CAFAS (Hodges, 1991) was also used to determine whether significantly different categorizations would have occurred had this measure been used to establish improvement versus no improvement. The categorization was approximately the same, with one exception. Females were slightly less likely to be identified as having made improvement. This different was not significant. We hypothesize that the CAFAS is not as sensitive as the CBCL to internalizing behaviors; however, this needs to be examined in detail beyond the scope of this paper.

There are important assumptions made in considering change scores, independent of the method used to estimate reliable change. There is an assumption that: (a) children and families seeking system of care services actually received them, (b) that baseline and posttest scores are parallel measurements, (c) that change cannot be attributed to measurement error and related regression effects, and (d) finally that change is attributed as evidence of the effectiveness of treatment services.

Results

Six months after enrollment into the Nashville Connection, 52% of the children were identified as having improved in terms of the CBCL Total Problem Scale using the EN method. Forty-eight percent of the children experienced no reliable improvement (40% experienced stabilization of symptoms/ emotional status, but no reliable change, and about 8% reported some worsening of symptoms and emotional status). The baseline CBCL scores for many of the children with no change (stable scores) tended to show the highest clinical levels, T-scores of 85 and higher. While stable scores at borderline or below clinical thresholds are acceptable, score within this range are less than favorable outcomes for a six-month intervention period.

There were no appreciable differences between children experiencing improvement and no improvement between baseline and six-months, with the exception of PTSD; 75% of children with a diagnosis of PTSD experienced no improvement. This is not unusual as the research literature indicates that children diagnosed with PTSD tend to have higher clinical scores on both internalizing and externalizing assessments as well as severe problems in terms of relationships and sociability (Saigh, Yasik, Oberfield, Halamandaris, & McHugh, 2002). All children with a diagnosis of PTSD had additional secondary and tertiary diagnoses, most commonly ADHD and conduct disorder, which are frequently noted in the research literature as well (Saigh, Yasik, Sack, & Koplewicz, 1999).

The presence of many family and child risk factors at baseline was significantly associated with the lack of improvement at the six-month follow up data collection. Table 2 presents these findings. Bolded percentages indicate significant differences between children with improvement between baseline and six-month follow-up compared to those children experiencing no improvement. Overall, these risk factors had a stronger association with internalizing behaviors as assessed with the CBCL. The experience of living in a violent household was also associated with a higher frequency of caregiver report of suicidal behavior.

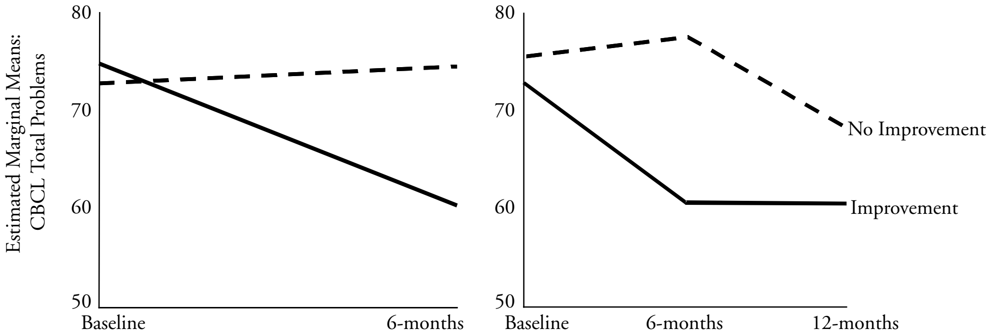
As noted previously, children were identified as *improving* and *not improving* based on reliable change between baseline and six-month follow-up. A general linear model (GLM) was used to examine change over time for children initially identified as *improving* and *not improving*. Figure 1 illustrates the results of this analysis. At baseline, there was no significant difference in the CBCL Total Scale score between the initial improving and non-improving children. All children were above the clinical threshold (T-score of 70 or higher), and the improving children had slightly higher baseline scores compared to their non-

Table 2
Association between Family and Child Risk Factors and Improvement

	Internalization		*Externalization*	
*Risk Factor**	*Improvement*	*No Improvement*	*Improvement*	*No Improvement*
Family history of domestic violence	22%	**76%**	44%	**56%**
Family history of mental illness	27%	**53%**	41%	**59%**
Parent psychiatric hospitalization	27%	**53%**	20%	**80%**
Parent conviction of a felony	37%	**63%**	49%	51%
Family history of substance abuse	42%	**58%**	47%	53%
Previous child psychiatric hospitalization	46%	54%	50%	50%

* *Note:* Family history includes biological relatives, and does not pertain solely to parents.

Figure 1
Change Over Time: Initial Improvement Versus Initial Non-improvement



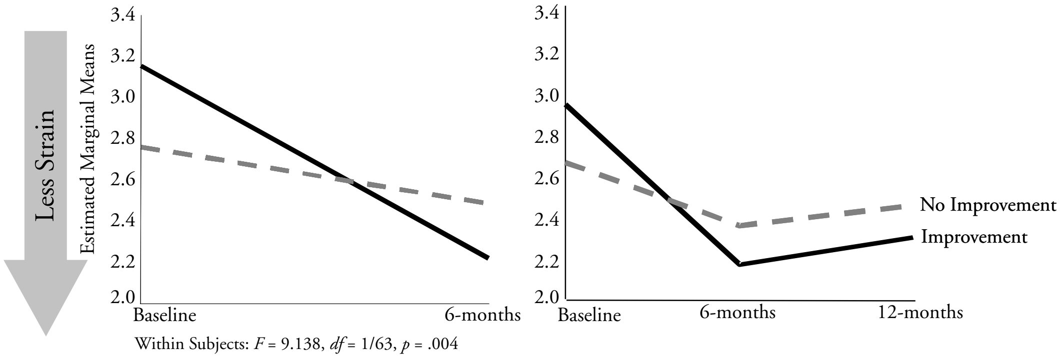
Within Subjects: F = 65.929, df = 1/63, p = .000
Between Subjects: F = 9.138, df = 1/63, p = .002

Between Subjects: F = 5.906, df = 1/42, p = .02

improving counterparts. Forty-two children and families completed a second follow-up interview at 12 months. Children showing no initial improvement did demonstrate improvement between the 6and 12-month follow-up. At 12 months, these children were slightly below the clinical threshold with a T-score of 69. Improvement for the children making initial progress remained stable between 6and 12 months.

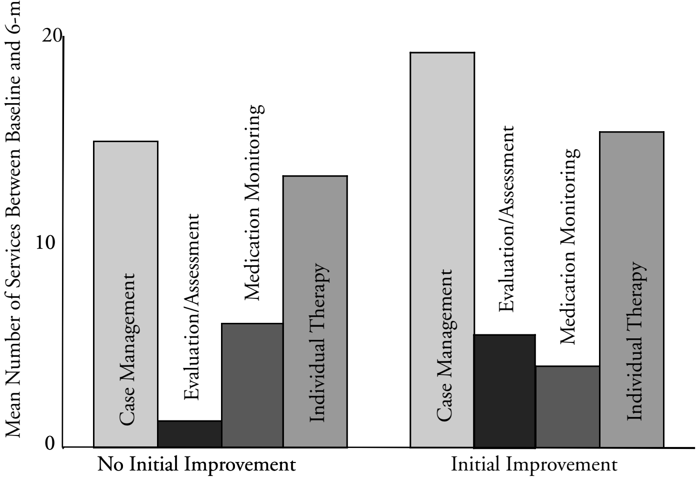
Caregiver stress. Because so many of the families reported facing considerable challenges (mental illness themselves, domestic violence, etc.) we questioned how improvement or the lack of improvement would affect caregiver stress. Figure 2 illustrates the findings of the GLM analysis of caregiver strain across time. Between baseline and six-months, both groups experienced a reduction in the overall stress associated with caring for a child with mental health challenges. However, the change for caregivers of children who initially improved had the most significant decline in overall stress and strain, F = 9.138, df = 1/63, p = .004. Between six months and 12 months, the overall stress for the caregivers of both groups of children increased significantly, F = 5.867, df = 1/41, p = .021, but the magnitude of that change did not differ between caregivers of children initially improving and those who did not improve.

Figure 2
Change In Caregiver Strain: Initial Improvement Versus Non-improvement



Service patterns. The service patterns (self-reported by caregivers) were also examined to determine whether there were differences between children demonstrating initial improvement and those who did not. Figure 3 illustrates the patterns for four of the services most children in the Nashville Connection receive (case management, evaluation and assessment, medication monitoring, and individual therapy). For all but one service, medication monitoring, the children showing improvement received more service encounters for individual therapy, case management, and evaluation services than did the children exhibiting no improvement.

Figure 3
Services Received for Youth with
No Initial Improvement vs Initial Improvement at 6-Months



Discussion

Though these analyses are preliminary, they do shed some light on the need for the system-of-care model to include and link more heavily with adult services. The data for this sample of children indicate that these families face considerable challenges. Fifty-three percent of the children have three or more of the risk factors identified in Table 2. The findings from these preliminary analyses reveal that children experiencing these risk factors have less likelihood of improvement after six months of services. It is important to note, however, that these children do show improvement between six and twelve months. This begs the question of when we should assess change, and questions the assumption that six months of service is sufficient for meaningful change. Anecdotal conversations with caregivers participating on the Nashville Connection evaluation advisory committee reveal that negative events or changes (school, custody, residence, etc) occurring between or near scheduled data collection periods can alter findings and obscure progress that may have characterized much of the six-month period.

The increase in caregiver stress and strain after an initial decline is yet another indication that support is needed by the caregiver on a continual basis. It is important to note that children showing no initial improvement did make progress between six months and twelve months; however, their caregivers reported greater overall stress and strain.

With regard to the different pattern of services received by children initially improving and those who did not, it is not known whether these services were offered and if the families faced challenges that prevented accessing these services for their children, or whether these families were not offered these services. Additionally, the more frequent medication monitoring services received by children experiencing no initial improvement may indicate more complex diagnostic profiles. Without further examination of clinical records, this remains speculative. It is interesting to note that these children also receive fewer evaluation and assessment services.

Analyses planned for the future include an examination of the correspondence between the treatment plans and what services were actually received by children and families, and how treatment plans may differ between children who initially improved and those who did not. Again, anecdotal conversations with families reveal that often the families facing the most risks and challenges have more limited resources and less ability to take advantage of the services and supports that are offered to them.

References

Brannan, A. M., Heflinger, C. A., & Bickman, L. (1994). *The burden of care questionnaire: Measuring the impact on the family living with a child with serious emotional problems*. Nashville, TN: Vanderbilt Center for Mental Health Policy.

Bugental, J. F. T. (1988). What is "failure" in psychotherapy? *Psychotherapy, 25*, 532-535.

Hodges, K. (1991). *Manual for the Child Adolescent Functional Assessment Scale*. Unpublished Manuscript.

Hsu, L. M. (1989). Reliable changes in psychotherapy: Taking into account regression toward the mean. *Behavioral Assessment, 11*, 459-467.

Hsu, L. M. (1995). Regression toward the mean associated with measurement error and the identification of improvement and deterioration in psychotherapy. *Journal of Consulting and Clinical Psychology, 63*, 141-144.

Jacobson, N. S. & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology, 59*, 12-19.

Lambert, M. J., Shapiro, D. A. & Bergin, A. E. (1986). The effectiveness of psychotherapy. In S. L. Garfield & A. E. Bergin (Eds.), *Handbook of psychotherapy and behavior change*. 3rd Edition, (pp. 157-211). New York: Wiley.

Lambert, M. J., Hansen, N. B., & Finch, A. E. (2001). Patient-focused research: Using patient outcome data to enhance treatment effects. *Journal of Consulting & Clinical Psychology, 69*(2) 159-172.

Nunnally, J. C. & Kotsch, W. E. (1983). Studies of individual subjects: Logic and methods of analysis. *British Journal of Clinical Psychology, 22*, 83-93.

Saigh, P. A., Yasik, A. E., Oberfield, R. A., Halamandaris, P. V., & McHugh, M. (2002). An analysis of the internalizing and externalizing behaviors of traumatized urban youth with and without PTSD. *Journal of Abnormal Psychology, 111*(3) 462-470.

Saigh, P. A., Yasik, A., Sack, W.,& Koplewicz, H. (1999). Child-adolescent posttraumatic stress disorder: Prevalence, comorbidity, and risk factors. In P. A. Saigh & J. D. Bremner (Eds.), *Posttraumatic stress disorder: A comprehensive textbook* (pp. 19–43). Needham Heights, MA: Allyn & Bacon.

Speer, D. C. (1992). Clinically significant change: Jacobson and Truax (1991) revisited. *Journal of Consulting and Clinical Psychology*, 60, 402-408.

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Integrating Research and Practice on a Child and Adolescent Inpatient Psychiatric Unit

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Introduction

In January 2000, the Inpatient Psychiatry Unit at the Children's Hospital of Eastern Ontario (CHEO) expanded to 18 beds and significantly reorganized its service delivery model. In keeping with best practices, increased clinical need, and fiscal demands, CHEO shifted the focus of the unit toward brief crisis intervention, assessment, and transitional care services. This change reflected CHEO's need to offer inpatient services to both children and adolescents and to respond to an increasing number of crisis admissions that had resulted from CHEO's designation as the single regional site for psychiatric emergencies. A core value of this new, dynamic model of service delivery is to provide youth- and family-centered care based on individual needs.

The New Service Delivery Model

The majority of youth are admitted for crisis stabilization but move along different clinical pathways to discharge; these specialized psychiatric services consist of three components: crisis stabilization, interdisciplinary assessment, and transitional care services. *Crisis stabilization services* are provided within the first 72 hours of admission. The goals are to assess risk from the perspective of youth, family/guardian, and staff, determine the need for comprehensive assessment by gathering information from community partners, and to stabilize the crisis by providing a safe environment. Discharge planning is also initiated. When there are complex biopsychosocial issues, *Interdisciplinary assessment services* are provided following crisis stabilization. On occasion, youth with particularly severe and complex situations may be admitted on an elective basis for assessment. In addition to the ongoing assessment provided by front-line staff and psychiatrists, comprehensive assessments are individualized to each youth's needs and can involve psychologists, social workers, occupational therapists, and/or teachers. The goal is to provide these services within a 3- to 14-day period. Toward the end of the assessment period there is an increased focus on discharge planning. *Transitional care services* may also be provided following crisis stabilization and/or assessment when a need for further inpatient services is identified. This component may involve more complex cases, or include youth for whom there are issues requiring additional, intensive intervention prior to successful discharge (e.g., response to medication, ongoing safety or placement issues). Elective admissions are also available. Transitional care services are individualized, goal-directed, and provided within a 2- to 6-week period.

The goals of the unit are to: (a) provide valid assessments of risk severity and acuity from multiple sources of information; (b) provide risk reduction and crisis stabilization by providing a safe environment; (c) provide a comprehensive interdisciplinary assessment (if warranted) and provisional diagnosis; (d) provide a treatment plan and mobilize resources involving family and community; (e) provide brief, individualized, goal-focused transitional care (if warranted), and; (f) accomplish these goals within a short length of stay. These goals are evaluated on an ongoing basis using both process and outcome variables.

The purpose of the current research is to present characteristics and outcome data for youth who received services along different clinical pathways in the new service delivery model. This outcome management approach allows for ongoing assessment of the appropriateness and quality of services provided to youth and their families. With this approach, research is embedded directly into daily clinical services, and helps to address the paucity of effectiveness research for short-stay psychiatric hospitalization of youth.

Method

Two hundred and eleven youth (*N* = 211) aged 7-17 and/or their parent/guardian gave informed consent for the use of their clinical information for research purposes. Only one admission per youth was included. Primary admission diagnoses (DSM-IV) were made by the admitting psychiatrist, and included mood disorders (46%), adjustment disorders (9%), psychotic disorders (9%), anxiety disorders (7%), and disruptive behavior disorders (7%). Other diagnoses were each represented in less than 5% of the sample.

The sample was divided into three groups according to services received. The Crisis group (*n* = 96) included youth who were admitted for crisis stabilization and were subsequently discharged or transferred to another facility. The Assessment group (*n* = 90) included youth who, following crisis stabilization, received comprehensive assessment services by one or more members of the interdisciplinary team. These youth were then discharged or transferred to another facility. The *Transition* group (*n* = 25) included youth who, following crisis stabilization and/or assessment, were referred for inpatient transitional care services. Outcome data for all youth are based on length of stay while receiving crisis and/or assessment services only.

Measures

The following outcome and case-mix measures were used: Childhood Acuity of Psychiatric Illness Scale (CAPI; Lyons, 1998), Childhood Severity of Psychiatric Illness Scale (CSPI; Lyons, 1998), Children's Depression Inventory (CDI; Kovacs, 1992), Multidimensional Anxiety Scale for Children -10 item (MASC-10; March, 1997), Youth Self-Report (YSR; Achenbach, 1991a), and the Child Behavior Checklist (CBCL; Achenbach, 1991b). Data collection is fully integrated with the daily provision of clinical services. As part of the routine admission process, youth complete the CDI, MASC-10, and YSR, parents/guardians complete the CBCL, and the staff complete the CAPI. The psychiatrist or psychologist involved with the youth completes the CSPI. Information from these measures is subsequently integrated into the clinical assessment at daily team rounds. At discharge or transfer, staff complete the CAPI. Youth admitted for 14 days or more complete the CDI and MASC-10 again.

Results

Youth and Parent Self-Report Measures

The Assessment group generally reported higher levels of emotional and behavioral problems on the YSR than did other groups; however, this difference was significant only for Internalizing Problems ($F(2, 182) = 3.1$, $p < .05$) and Anxiety/Depression ($F(2, 182) = 3.4$, $p < .05$). Post-hoc analyses (Tukey HSD) indicated that Assessment youth had higher scores than Crisis youth. However, all groups had clinically elevated scores on these scales. A similar pattern was observed for the CDI; the Assessment group reported significantly higher symptoms of depression than the Crisis group ($F(2, 191) = 4.8$, $p < .01$). The Transition group reported depressive symptoms at a level similar to the Assessment group. Group differences were not observed on the MASC-10 nor were these means in the clinical range.

Parent/guardian reports of youth's emotional and behavioral functioning on the CBCL were generally higher for the Assessment group compared to other groups. Significant differences were observed for Externalizing Problems ($F(2, 144) = 3.2$, $p < .05$) and Delinquent Behavior ($F(2, 144) = 3.4$, $p < .05$), where the Assessment group had higher scores than the Transition group. For Somatic Complaints, the Assessment group had a higher mean score than the Crisis group ($F(2, 144) = 5.1$, $p < .001$).

Childhood Severity of Psychiatric Illness Scale (CSPI)

Approximately eight of the 27 clinically relevant dimensions were rated as moderately or severely dysfunctional for youth in each group. Furthermore, for all groups, emotional disturbance (i.e., mood or anxiety symptoms), suicide risk, and school, family and peer functioning were identified as areas in need of clinical intervention. Significant differences emerged for conduct problems ($F(2, 169) = 6.7$,

$p < .005$), oppositional behavior ($F(2, 170) = 9.3$, $p < .001$), and impulsivity ($F(2, 170) = 3.8$, $p < .05$), such that the Crisis group was rated at a more severe level than the Transition group. The Crisis group was also identified as having greater multisystem needs than the Transition group ($F(2, 169) = 4.2$, $p < .05$). That is, they had needs beyond those provided within the mental health system (e.g., special education, criminal justice). Finally, caregiver knowledge of the child was significantly poorer for Transition and Assessment youth compared to Crisis youth ($F(2, 165) = 8.7$, $p < .001$).

Discharge Data

Median length of stay on the crisis stabilization and assessment service for each group corresponded closely to the time frames of the service delivery model. Across all groups, the majority of youth were discharged or transferred as planned, without delay. Primary discharge diagnosis varied significantly across groups, $\chi^2(14) = 26.0$, $p < .05$. Unipolar mood disorders, psychotic disorders, and anxiety disorders were more prevalent for Transition youth, whereas disruptive behavior disorders were more prevalent for Crisis and Assessment youth. Finally, medication changes were made for significantly more youth in the Transition group than in the other two groups, $\chi^2(2) = 23.8$, $p < .001$.

Outcome Analyses

Changes in acuity level (as measured by the CAPI) during admission did not vary significantly according to service pathway ($F < 1$). Reliable improvements (i.e., reliable change index; Jacobson, Roberts, Berns, & McGlinchy, 1999) were observed on average for all groups, with larger changes evident for Risk Factors and Symptoms. Also, at least 80% of youth in each group showed reliable improvement in total acuity level. The majority of youth in each group improved on the four CAPI subscales. However, for Systems Support, less than half of Crisis and Assessment youth showed reliable improvement. Compared to other groups, more Transition youth showed a reliable *increase* in total acuity level at the time of transfer (15% vs. 9% and 6%). This was most apparent for Risk Factors (e.g., suicide risk) and Symptoms (e.g., depression).

Discussion

The Inpatient Psychiatry Unit at CHEO has been successful in fully integrating research and clinical practice into a newly developed model of service delivery. Profiles of youth within each clinical pathway provide further validation for the new model of care. The CAPI (the primary outcome measure) proved sensitive to short term change in risk acuity from admission to discharge. The majority of youth showed reliable improvement in total acuity level regardless of length of stay or type of service received. As expected, improvement was observed primarily for risk factors and symptoms.

The results support the growing body of evidence (Bloom, 2000) that brief psychiatric hospitalization can result in positive clinical outcomes for children and adolescents in psychiatric crisis. Short admissions can provide stabilization of acute crisis and symptom reduction. Overall, this outcome management approach to service delivery provides a mechanism for ongoing evaluation of the quality of care by providing standardized data on the characteristics, needs, and outcomes of youth served. This information allows for the development of targeted and individualized programming. This approach provides an exciting example of how to successfully bridge the gap between research and clinical practice.

References

Achenbach, T. M. (1991a). *Manual for the Youth Self Report/11-17 and 1991 profile*. Burlington, VT: University of Vermont Department of Psychiatry.

Achenbach, T. M. (1991b). *Manual for the Child Behavior Checklist / 4-18 and 1991 profile*. Burlington, VT: University of Vermont Department of Psychiatry.

Bloom, B. L. (2000). Brief inpatient treatment for psychiatric disorders. *Crisis Intervention, 5*, 241-247.

Kovacs, M. (1992). *The Children's Depression Inventory (CDI) manual*. Toronto, ON: Multi-Health Systems.

Jacobson, N .S., Roberts, L. J., Berns, S. B, & McGlinchey, J.B. (1999). Methods for defining and determining the clinical significance of treatment effects: description, application, and alternatives. *Journal of Clinical Psychology, 67*, 300-307.

Lyons, J. S. (1998). *The Severity and Acuity of Psychiatric Illness scales: An outcomes-management and decision-support system – Child and Adolescent Version. Manual.* San Antonio, TX: Psychological Corporation.

March, J. S. (1997). *Multidimensional Anxiety Scale for Children – technical manual*. Toronto, ON: Multi-Health Systems.

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Predictors of Caregiver-Reported Improvement in Child Behavior and Functioning

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Introduction

There is increasing pressure on providers of child and adolescent mental health (MH) services to demonstrate quality and effectiveness of care, and to involve consumers in service evaluation (Kessler & Mroczek, 1995). Consumer surveys offer perhaps the least burdensome and costly means of assessing service quality and effectiveness, an important consideration given the limited resources available to most providers. However, the meaning of quality for consumers and their families remains unclear, and the determinants of consumer-reported improvement in child behavior and functioning have not been well studied. Interpretation of caregiver reported outcome measures is often hindered by lack of knowledge regarding the primary demographic and service-related characteristics influencing caregiver perceptions, as well as by incomplete understanding of the clinical and functional factors underlying caregiver ratings of child outcomes.

In this study we use linked survey and clinical data from one state to explore potential predictors of caregiver-reported improvement in child behavior and functioning, as measured by the Youth Services Survey for Families (YSSF; Brunk, Innes, & Koch, 2002).

Methods

The study used data from the Virginia Department of Mental Health, Mental Retardation and Substance Abuse Services (DMHMRSAS) Performance Outcomes Measurement System (POMS). The POMS is a broad-scale initiative designed to monitor outcomes of state-funded MH services. As part of this project, data were collected on the demographic, legal, referral, diagnostic, and other characteristics of a representative sample of eligible child consumers. Clinician assessments were performed at intake and every six months until discharge using the Child and Adolescent Functional Assessment Scale (CAFAS; Hodges, 1990). In addition, an annual survey of caregiver perceptions of services was completed on a representative sub-sample of the POMS population using the YSSF.

The YSSF, a comprehensive new instrument designed to measure caregiver perceptions of both child MH services and outcomes of treatment, has been used in at least 20 states to monitor consumer perceptions of children's MH services. The YSSF was developed in collaboration with consumers and their families, helping to ensure that the survey addressed concerns specifically relevant to this group. The YSSF includes 22 items that reliably measure five major domains of caregiver perceptions, including improvement in child behavior and functioning (Brunk, Innes, & Koch. 2002.). Respondents are asked to rate each of the following six items using a 5-point Likert-type scale, ranging from 1, *strongly disagree*, to 5, *strongly agree*.

YSSF Outcome domain: (Cronbach's alpha = 0.94)

As a result of the services my child and/or family received:

- My child is better at handling daily life
- My child gets along better with friends and other people
- My child gets along better with family members
- My child is doing better in school and/or work
- My child is better able to cope when things go wrong
- I am satisfied with our family life right now

The YSSF includes questions regarding child contact with the juvenile justice system and history of school absence within the last month. Also included are questions regarding child demographic characteristics, residential status, contact with medical providers, Medicaid status, medications for behavioral/emotional problems, length of services, and whether the child is still receiving services.

Survey methods. In May 2002, the YSSF was mailed to a random sample of 3,054 primary caregivers of youth with serious emotional disturbance (SED) who had received at least one MH service from a state-funded MH provider between July 1 and December 31, 2001. Each survey was identified by a unique code to both ensure consumer confidentiality and facilitate linkage of survey data with information obtained through POMS. A total of 526 valid surveys (17%) were returned. Data from 514 surveys were successfully linked to the larger POMS dataset. Of the 3,960 children entered into the POMS data files, baseline assessment (CAFAS) data were available for 1,515 subjects, and both YSSF and CAFAS data were available for a total of 199 youth.

Analysis. We evaluated the relation of caregiver perceptions of child outcome to demographic characteristics, service-related factors, and baseline clinical status. We also assessed the association of caregiver outcome perceptions to other indicators of functional and clinical status, including child placement history, school absence, child legal involvement, and CAFAS scores. Chi square analysis was employed to analyze associations between categorical variables and dichotomous outcomes. Perceived improvement was evaluated as a continuous variable (i.e., mean score on constituent items of the YSSF outcome domain). Crude associations of caregiver rated improvement in child outcome to potential explanatory factors were evaluated using *t*-tests, ANOVA, and Pearson correlation analysis. Adjusted associations were assessed using linear regression and partial correlation analysis.

Results

Characteristics of the study population are given in Table 1. Relative to child consumers not represented in the YSSF, those who were represented were more likely to be enrolled in special education (39 vs. 34%) and to have received a deferred diagnosis at intake (13 vs. 2%). However, the two groups did not differ on any other demographic, service, or clinical characteristics, suggesting that youth for whom YSSF data were available were representative overall of children with SED receiving state-funded MH services in Virginia. Similarly, youth for whom both YSSF and CAFAS data were available were more likely to be enrolled in special education and less likely to be on Medicaid and to have been referred through the schools or legal system, but were otherwise similar to children not represented in the YSSF.

Results suggest that several factors may influence caregiver perceptions of behavioral change. Caregivers were likely to report greater perceived improvement for youth who were receiving Medicaid, were living in a homelike setting, were still receiving services from the same provider, and were in services for longer periods of time (see Table 2). Conversely, youth who had been placed out of the home, had been referred through the schools or legal system, or were more impaired at admission were less likely to be perceived as having positive outcomes. Adjustment for other factors slightly reduced the effect of service status and baseline impairment, but did not affect the influence of other demographic or service-related characteristics.

Recent youth contact with the justice system and school absence were strongly and negatively associated with caregiver ratings of child outcome (Tables 2 & 3), suggesting that caregiver perceptions of outcome may in part reflect recent functional impairment. Overall change in functioning on CAFAS scores was not associated with caregiver perceptions of overall outcome on the YSSF, $r = 0.12$, $p > 0.1$; however, changes in two CAFAS subscales – i.e., Emotions and Thinking – were significantly and positively related to caregiver reports of perceived improvement (Table 3). When only caregiver perceptions of improvement in school were evaluated, significant associations were observed with overall improvement in functioning and reduction of impairment related to Moods/Emotions and Thinking (Table 4). Adjustment for other factors did not appreciably alter these associations.

Table 1
Characteristics of Youth Consumers in Three Samples

	Represented in YSSF			
	No (N=3446) % Total	*Yes (N=514) % Total*	*CAFAS & YSSF data (N=199) % Total*	*P*
Race/Ethnicity				
Nonhispanic white	68.8	66.2	67.4	
Black	26.6	29.9	31.1	
Hispanic	2.5	3.2	1.6	
Other	2.1	0.7	0.0	
Child age group (years)				
Less than 3	0.2	0.2	0.0	
3-12	48.5	50.8	52.8	
13-18	51.3	49.0	47.2	
Average age in years: Mean (SE)	*12.1 (0.1)*	*11.9 (0.2)*	*11.9 (0.2)*	
Gender				
Female	38.1	36.9	37.1	
Male	61.9	63.1	62.9	
Enrolled in Special Education	33.6	38.7	46.9	*abc
On Medicaid	55.9	53.9	45.6	*bc
Legal status				
Voluntary	88.6	90.0	91.6	
Involuntary	11.4	10.0	8.4	
Previous hospitalization	15.3	14.9	18.0	
Referral source				*bc
Education/legal	30.6	26.8	21.9	
Self, provider, or other	69.4	73.2	78.1	
Discharge status				
Evaluation only	3.9	4.3	0.0	
Treatment completed	24.6	26.2	19.6	
Treatment not completed	71.5	69.5	80.4	
Baseline diagnosis				*ac
Major mental illness	14.7	14.6	19.3	
Externalizing disorder	49.0	46.7	53.8	
Internalizing disorder	20.2	16.5	19.3	
Other	14.2	9.5	6.1	
Diagnosis deferred	1.9	12.6	1.5	
Initial level of dysfunction (CAFAS)†				
Minimal/mild	23.4	20.6	20.6	
Moderate	57.9	62.4	62.4	
Severe	18.7	16.9	16.9	
CAFAS scores: Scale 5 means (SE)				
Initial assessment (*N*=1515)†	53.8 (0.65)	54.0 (1.6)	54.0 (1.6)	
Most recent assessment (*N*=803)†	45.2 (0.95)	44.5 (2.2)	44.5 (2.2)	
Change from initial to most recent assessment (*N*=648)††	10.9 (0.9)	8.7 (2.2)	8.7 (2.2)	
Currently living with caregiver	NA	85.8	88.2	
Visited emergency room in the last year	NA	42.4	43.1	
On medication for emotional/behavioral problems	NA	64.0	62.4	
Receiving services from same provider	NA	59.1	60.9	
Length of services received	NA			
Less than 6 months		25.6	28.7	
6-12 months		32.5	34.1	
More than 12 months		41.9	37.3	
Arrested by police in last month	NA	3.3	4.2	
In court in last month	NA	8.7	11.0	
Any legal involvement in last month	NA	9.6	11.6	
Absent from school in last month	NA			
One day or less		46.5	44.0	
2 days		15.6	15.6	
3-5 days		17.5	14.5	
6-10 days		5.8	6.9	
>10 days		8.2	11.6	
Child not in school		6.3	7.5	

† Higher scores indicate more impairment in functioning
†† Positive scores indicate improvement in functioning
* $P < 0.05$. a = Represented in YSSF vs. not; b = Linked YSSF-CAFAS data vs. not;
c = Linked YSSF-CAFAS data vs. not (YSSF participants only). No asterisk = Non-significant ($P > 0.05$)
P values determined using Chi Square analysis (for categorical variables) or ANOVA (for continuous variables)
NA: Information not available

Table 2
Association of Caregiver-Reported Improvement in Child Behavior to Child Characteristics and to Other Child Outcome Measures As Reported on the YSSF

	Caregiver-rated Improvement in Child Behavior		
Child characteristics	*N*	*Mean (SE)*	*P†*
On Medicaid			0.003
No	199	3.1 (0.1)	
Yes	232	3.4 (0.1)	
In homelike setting for last 6 months			0.000
No	60	2.8 (0.2)	
Yes	325	3.4 (0.1)	
Out of home placement within last 6 mos			0.001
No	313	3.4 (0.1)	
Yes	72	2.9 (0.1)	
Referral category			0.01
Self, provider, or other	307	3.4 (0.1)	
Education/legal	114	3.1 (0.1)	
Still getting services?			0.00
No	202	3.1 (0.1)	
Yes	291	3.5 (0.1)	
Length of service			0.001
Less than 1 month	21	2.8 (0.3)	
1-2 months	26	3.0 (0.2)	
3-5 months	74	3.1 (0.1)	
6-12 months	153	3.3 (0.1)	
More than 12 months	197	3.5 (0.1)	
Test for trend, F=21.7, df=1, p < 0.001			
Initial level of dysfunction††			0.05
Minimal/mild	40	3.3 (0.2)	
Moderate	118	3.4 (0.1)	
Severe	32	2.9 (0.2)	
Other child outcomes			
School absence during last month			0.000
0-1 days	206	3.6 (0.1)	
2 days	72	3.4 (0.1)	
3-5 days	79	3.1 (0.1)	
6-10 days	26	2.9 (0.2)	
More than 10 days	37	2.5 (0.2)	
Test for trend, F=44.7, df=1, p < 0.001			
Child arrested by police in last month			0.000
No	478	3.4 (0.1)	
Yes	17	2.2 (0.3)	
Child been in court during last month			0.000
No	448	3.4 (0.1)	
Yes	42	2.3 (0.2)	

† P values determined using *T* test or ANOVA
††Based on CAFAS total score (scale 5)

Table 3
Relation of Caregiver-Reported Improvement in Child Behavior[a] To Recent School Absence and CAFAS Scores

	Correlation with caregiver-rated improvement[a]	*(r value)*	*P*
School days absent	Crude	-0.31	***
	Adjusted†	-0.32	***
	Adjusted††	-0.32	***
CAFAS scores			
Initial assessment (scale 5)	Crude	-0.14	(*)
	Adjusted††	-0.18	*
Change in emotion subscale	Crude	0.22	*
	Adjusted†	0.24	*
	Adjusted††	0.28	*
Change in thinking subscale	Crude	0.65	***
	Adjusted†	0.65	***
	Adjusted††	0.77	*

[a] As reported in the YSSF
(*) $P < 0.1$; * $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$
†Adjusted for initial problem severity (based on baseline CAFAS)
††Also adjusted for Medicaid, homelike setting, and referral source

Table 4
Relation Of Caregiver-Reported Improvement In School Functioning[a] To Change In CAFAS Scores

CAFAS scores	*Correlation with caregiver-rated improvement*[a]	*(r value)*	*P*
Change in total score (scale 5)	Crude	0.24	**
	Adjusted†	0.26	**
	Adjusted††	0.23	*
Change in mood subscale	Crude	0.28	***
	Adjusted†	0.25	**
	Adjusted††	0.25	*
Change in thinking subscale	Crude	0.63	*
	Adjusted†	0.57	***

[a] As reported on YSSF item 20 ('My child is doing better in school')
*$P < 0.05$; **$P < 0.01$; ***$P < 0.001$
†Adjusted for initial problem severity (based on baseline CAFAS)
††Also adjusted for Medicaid, homelike setting, length of services, and referral source

Conclusions

In brief, results of this study indicate that caregiver perceptions of child treatment outcomes may be influenced by several factors, including Medicaid status, child residential setting and placement history, service-related characteristics, and baseline clinical functioning. Caregiver ratings of improved child outcomes were also strongly and negatively associated with caregiver reports of recent child legal involvement and school absence, and positively associated with specific clinician-rated changes in child functioning on the CAFAS. These findings suggest that caregiver-reported improvement on the YSSF may reflect both recent functional impairment and clinical/therapeutic change.

Our results also suggest disparities between clinician-rated change and caregiver-reported improvement in child behavior and functioning. While perceived improvement was modestly correlated with specific CAFAS subscales, only caregiver-rated improvement in school functioning was significantly associated with CAFAS scores overall. These findings are consistent with other studies reporting low to moderate agreement between therapist and parent ratings of child outcomes (Northrup, 1995). These disparities suggest that clinician and parent-reported measures may in part reflect different perspectives and concerns. While caregiver reported improvement may not directly parallel clinician-rated change, the former measure may reflect the symptom and functioning changes that are most important to youth consumers and their families. In addition, caregiver perceptions may be an indicator of increased caregiver coping and parenting skills (Kopec-Schrader, Rey, Plapp, & Beumont, 1994), reduced caregiver stress, and increased socio-emotional resources, enhancing the caregiver's ability to manage the child effectively at home. Caregivers, who live with and observe their child on a daily basis, may also be more likely than clinicians to detect subtle changes in behavior that render the child easier to manage.

Limitations of this study include lack of information on caregiver expectations at entry into treatment, which have been related to treatment outcomes in some studies (Morrissey-Kane, & Prinz, 1999; Nock, & Kazdin, 2001). In addition, the survey was administered several months after the last recorded CAFAS assessment, a time lag that could have attenuated the observed associations between caregiver perceptions and clinician-rated outcomes.

Future research is needed to address the factors underlying the observed disparities between clinician and caregiver-rated change in child behavior and functioning (Northrup, 1995; Weiss, Rabinowitz, & Spiro, 1996). In particular, studies are needed to clarify the role of enhanced parental functioning, caregiver expectations at entry into treatment, and other factors in shaping caregiver perceptions of child outcomes, and to determine the relation of these factors to clinician-rated change in child functioning. Since caregivers play such a vital role in both the short and long term success of their child's treatment, understanding these factors is likely to have important implications for the delivery of child MH services.

References

Kessler, R., & Mroczek, D. (1995). Measuring effects of medical interventions. *Medical Care 33*: 109-119.

Hodges, K. (1990). *Manual for the Child and Adolescent Functional Assessment Scale* (unpublished manuscript). Department of Psychology, Eastern Michigan University.

Brunk, M., Innes, K., & Koch, R. (2002). Caregiver perception of services and children's mental health outcomes: Are they related? In C. Newman, C. Liberton, K. Kutash, & R. M Friedman (Eds.), *The 15th Annual Research Conference Proceedings, A System of Care for Children's Mental Health: Expanding the Research Base* (pp. 145-152). Tampa, FL: University of South Florida, The Louis de la Parte Florida Mental Health Institute, Research and Training Center for Children's Mental Health.

Northrup, D. (1995). *The relationship between adolescent and parent reports about family issues.* Nashville, TN: Vanderbilt University.

Kopec-Schrader, E. M., Rey, J. M., Plapp, J. M., & Beumont, P. J. V. (1994). Parental evaluation of treatment in an adolescent service. *Journal of Adolescence*, 17(3), 239-249.

Morrissey-Kane, E., Prinz, R. J. (1999). Engagement in child and adolescent treatment: The role of parental cognitions and attributions. *Clinical Child & Family Psychology Review*, 2(3), 183-198.

Nock, M., & Kazdin, A. (2001) Parent expectancies for child therapy: Assessment and relation to participation in treatment. *Journal of Child and Family Studies*, 10(2), 155-180.

Weiss, I., Rabinowitz, J., & Spiro, S. (1996). Agreement between therapists and clients in evaluating therapy and its outcomes: Literature review. *Administration and Policy in Mental Health, 23*:493-511.

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IMPROVE: A Software Program to Improve Assessments and Multisector Referrals

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Introduction

For nonspecialty providers in social service settings who may not offer mental health services directly, quality of care often consists of identification of problems, providing access to appropriate resources and services through referrals, and monitoring service use and outcomes (Farmer, et al., 2001). Stiffman and colleagues have suggested that knowledge of service resources and lower burdens for referral are directly associated with an increase in problems identified, and with services provided (Stiffman et al., 2000, 2001).

Child welfare workers often have the first opportunity to observe and recognize the problems faced by underprivileged youth, and in this sense they act as gatekeepers of mental health services for young people (Farmer et al., 2001). Although expected to make referrals or help access services for youth and their parents, child welfare workers often lack the resources and knowledge to do so. In Missouri, the Division of Family Services (i.e., child welfare) purchases 23 million dollars worth of mental health services for youth each year. However, the Missouri Division of Family Services (DFS) does not have a formal system or indexed files for making community resource referrals to clients in the field. Because there are over 1300 potential referral resources in St. Louis City alone, current paper methods are inefficient in matching client need with services in a timely manner. DFS required a brief assessment tool that would indicate whether further assessment and treatment might be necessary.

This summary describes newly developed software, IMPROVE (Intervention for Multisector Health Provider Enhancement—child welfare), which enables child welfare workers to assess child and adolescent mental health needs and to then find the best fit for them among potential referral resources. The summary also discusses the startup process for IMPROVE, and presents initial results of the pilot usability evaluation.

The IMPROVE decision support software allows a worker to use a handheld computer device to record a youth's mental health symptoms, behaviors, and addictions by checking items on an assessment screen. A keyword checklist also allows workers to note peer problems, environmental stress, strengths and talents in order to find mental health services, foster care availability, and alternatives to formal treatment options (sports, the arts, and skill building) as well as traditional social welfare programs (housing, clothing and food). The software then matches assessment or keywords indicating client need with resource names, program descriptions, and contact information.

Methods

The pilot usability study, presented here, was a mixed methodological study (i.e., quantitative and qualitative), utilizing focus groups, individual interviews, and worker shadowing.

Focus Groups and Program Design

During the startup period, focus groups were conducted with DFS workers and administrators. Initial focus groups included potential DFS users, such as DFS workers, supervisors, and representatives from the State Capitol. Overall, participants expressed a high level of enthusiasm.

Names and descriptions of potential referral resources were obtained from DFS, United Way, and faith-based organizations. Key words identified by the United Way were included in the brief assessment tool under development.

DFS staff requested that the brief assessment indicate whether further assessment and treatment was necessary. These measures were incorporated during the startup period, using items from the Child

Behavior Checklist (CBCL; Achenbach, 1991a; Achenbach, Dumenci, & Rescola 2001). Pilot studies using Stiffman's data (Stiffman et al., 2000, 2001) showed that Depression and Conduct Disorder scales made from 14 Youth Self Report (YSR; Achenbach, 1991b) items were, in fact, related to those diagnoses. In the brief assessment, eight YSR items for ADHD/hyperactivity were included, with an 11-item scale indicating addiction risk (Swaim, Oetting, Edwards, & Beauvais, 1989; US Department of Health & Human Services, 1999; Weinberg & Glantz, 1997). Three or more "hits" on a scale identify 2/3 or more of youth who meet diagnostic criteria for risk of addiction.

Beta versions of the software were developed and tested in both handheld and desktop versions. DFS staff serving the St. Louis city area were assigned randomly to handheld, desktop PC, or usual procedure groups. Pre- and three-month follow-up measures of Worker Knowledge and Behavior, and pre- and 3-month measures of Administrative Behavior, were developed and tested. DFS supervisors assigned at least two workers who had little comfort or experience with computers to each group.

During the study, usability and acceptability of the handheld device were measured by shadowing the users (Benbunan-Fich, 2001). Problems with using the instrument, fumbling, client's reaction, and number of uses were recorded. We also conducted focus groups, in which participants were asked what it was like to use the instrument, and what workers/providers would like to change about the instrument. Participants were also asked whether using IMPROVE made a difference in the services they provided to their clients. Sample questions included: *What would you have liked to be different?* and *How did using the device change the way you helped people?*

The quantitative aspect of the pilot collected data covering: (a) Services provided (extent, type). From a list of 12 interventions, the provider checked whether each service was *not needed or provided*, *provided personally*, or *referred or recommended*;. (b) Provider background, experience, training and work/training histories; (c) Information on the provider's network of referrals and personal contacts with 24 different types of resources (Cronbach's alpha is .95.); (d) The client size for any services and for mental health services, as well as time spent making referrals; and (e) Worker use of the device, including the number of times any particular youth (or a general search) was accessed, the frequency of use and results obtained with the assessment screener, keywords used for each youth, agencies listed for each youth or his/her parent, and the number of times a specific agency information screen was accessed.

It is important to note that IMPROVE software was designed with sensitivity to protection of individual-level data. IMPROVE stores only certain types of information and deletes others upon exiting work with a particular youth. When establishing a youth profile, which is saved in that provider's personal program, the provider assigns the youth a unique code that only that provider knows (no names or social security numbers are used). This unique code does not link with any other youth data, is only identifiable by the provider who gave the code, and is only on the personal handheld or limited access computer site belonging to that provider. Once a provider has completed work with a youth (i.e., completes the assessment and referral process) and chooses to work with another youth or exit the software, all assessment information, referral lists, and service needs information is automatically deleted. The software has no provision for storing this information.

Results

Tape recordings of focus groups, and notes taken during shadowing, have been transcribed and analyzed for recurring themes. This summary draws inferences from the data, and they are being utilized to shape the final version of the software design and training. Focus groups revealed that providers with some computer experience were very positive about the IMPROVE program. They used it with clients primarily to look for agencies and details about agencies. They stated that they did refer youths to agencies using the information in the software. The details about the agencies were their favorite part of the program, and they appreciated being able to find them through keyword searches. The assessment section was only marginally helpful to them. Focus group participants reported that the handheld version was easy to use, and the on-screen writing (i.e., "graffiti") was easy to grasp, but found a desktop version easier to read and use. Interestingly, many workers not involved in testing the handheld version indicated a desire to use one. Participants liked the auxiliary programs, particularly the mapping program to help them find client homes, the address book to keep youth information, and the memo pad for taking notes in the community. They said that using the handheld device for taking notes appeared less threatening to the clients and inspired their interest. They stated that they used the handhelds "all the time" to write notes, check the time, and input addresses.

Participants found several aspects of the program less than optimal and made suggestions for changes. For example, the maps took too long to come up. They also suggested adding an ability to use multiple keyword searches to identify a more narrow group of services, adding "Home" and "Back" buttons at each screen, and allowing the user to enter initial letters in an agency name, thereby cutting down the time it takes to scroll through all the agencies. They also suggested using a keyword to list DFS contract agencies and their vendor numbers. Suggestions about training included a preference for multiple short sessions instead of 2-hour sessions, and for individually coached demonstrations over written instructions. Furthermore, it was discovered that learning the program initially did interfere temporarily with other work, and workers who were uncomfortable with computers and typing would be unlikely to use the software.

Conclusions and Discussion

The IMPROVE software has the potential for increasing multisector service access for youth served in nonspecialty sectors, such as child welfare. The program appears to be highly acceptable by DFS workers in both its stand-alone PC version and its handheld version. Since new lists of agencies, keywords, and assessment instruments can easily be inserted into the software using Microsoft Access, the software is potentially usable by teachers, physicians, child welfare workers, and juvenile justice workers, all of whom are often expected to identify mental health problems and make appropriate referrals. Future studies will examine the impact of IMPROVE on actual service use and outcomes.

References

Achenbach, T. M. (1991a). *Manual for the Child Behavior Checklist/4-18 and 1991 profile*. Burlington: University of Vermont, Department of Psychiatry.

Achenbach, T. M. (1991b). *Manual for the Youth Self-Report and 1991 profile*. Burlington: University of Vermont Department of Psychiatry.

Achenbach, T. M., Dumenci, & Rescorla, L. (2001). *Ratings of relations between DSM-IV Diagnostic Categories and items of the CBCL/6-18, TRF, and YSR*. Retrieved August 2, 2002 from www.aseba.org/research/DSM6-18ratings.pdf.

Benbunan-Fich, R. (2001). Using protocol analysis to evaluate the usability of a commercial web site. *Information & Management, 39*, 151-163.

Farmer, E. M. Z., Burns, B. J., Chapman, M. V., Phillips, S. D., Angold, A., & Costello, E. J. (2001). Use of mental health services by youth in contact with social services. *Social Service Review, 75* (4), 605-624.

Stiffman, A. R. , Striley, C. W., Horvath, V., Hadley-Ives, E., Polgar, M., Elze, D., & Pescarino, R. (2001) Organizational context and provider perception as determinants of mental health service use. *The Journal of Behavioral Health Services and Research, 28*, (2), 1-17.

Stiffman, A. R., Hadley-Ives, E., Dore, P., Polgar, M., Horvath, V. E., Striley, C., Elze,D.(2000). Youths' access to mental health services: The role of providers' training, resource connectivity, and assessment of need. *Mental Health Services Research, 2*, 141-154.

Swaim, R. C., Oetting, E. R., Edwards, R. W. & Beauvais, F. (1989). Links from emotional distress to adolescent drug use: A path model. *Journal of Consulting and Clinical Psychology. 57*, 227-231.

US Department of Health & Human Services. (1999). Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Treatment. *Winters, K. C., Revision Consensus Panel Chair. Screening and assessing adolescents for substance use disorders*. TIP 31. DHHS Pub. No. (SMA) 99-3344.

Weinberg, N & Glantz , M (1997). *Child Psychopathology risk factors for drug abuse: Features and mechanisms*. Available at: www.Nida.nih.gov/meetsum/meeting-SUM1.html

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