Toward Understanding Best Practices for Treating Schizophrenia
Final Report
Flinn Foundation Research Grant to
Rose Hill Center

April 30, 2007

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Executive Summary

This research examined methods that could be used to acquire and analyze data to quantify best practices in medicine and psychosocial rehabilitation for chronically and persistently mentally ill adults. Study results indicate that a personalized automated record of treatment and services can provide the kinds of data that are needed to make treatment for adults more effective and can become a real tool for behavioral health treatment providers to understand the links between treatment and outcomes. Results from the available data thus far show meaningful differences in attaining outcome indicators among clients related to both personal characteristics (e.g. presence of alcohol/drug problems) and characteristics of the intervention (e.g. use of atypical medication regimen). In addition to studying outcomes and influencing factors to identify best-practices, a process for identifying opportunities for consumer populations while treatment is underway was developed so that organizations can manage their programs based on outcomes regularly, as treatment is occurring – a much broader impact than post-study management.

Since the outcome indicators generated from this research were created by a research team that included clinicians and program supervisors as well as case managers working with ACT clients, it is likely that the *NextStep* automated reports provides information about outcomes that other agencies believe should be expected from behavioral health interventions. Thus, if other treatment providers using *NextStep* can agree to integrate the 15 core indicators into their treatment planning, eventually a large normative database and outcome reports can be produced.

This grant was a springboard for the development of more sophisticated statistical modeling. The added funding from the Michigan Mental Health Evidence Based Practice grant not only allows for further development of the mathematical models for measuring the effectiveness of a drug regimen as it relates to consumer outcomes, it also provides a framework (the medication algorithms) around which to examine the data. The outcome indicators derived from this study should be the client outcomes against which the mathematical models are tested. The 19 outcome indicators listed in the *NextStep* report are much more meaningful and useful for decision-making than the generic "treatment goals met" definition of outcomes more typically used in clinical studies.

The next steps for the research team are: (1) to populate the database with more clients from more providers to allow for sophisticated statistical modeling and comparison of outcomes across treatment modalities, and (2) to identify the research literature for similar populations to see how the theoretical model and goal attainment measured through *NextStep* compare with the existing literature and norms for chronically and persistently mentally ill clients.

This Flinn Foundation grant made a significant step toward allowing treatment providers to compare and contrast data across clients in order to develop best practices for treatment. With relatively small additional effort, *NextStep* can transform the ability of all behavioral healthcare organizations to evaluate the effectiveness of their treatments and adjust their programs accordingly. A next step for NextStep would be to create graphical depictions of the most important information found in the outcome reports to make it easy for administrators and clinicians who are not research-oriented to easily benefit from outcome based assessment.

Chapter 1: Overview of Project

Introduction

Within the current managed care environment for adults with severe and persistent mental illness, there is a need to not only substantiate the effectiveness of intervention but also to justify length of stay, treatment goals, and treatment type in relation to cost. Providers of mental health services need to both document treatment plans and their effectiveness, and have a way to compare and contrast data across clients in order to develop best practices for treatment. Toward this end, for the past four years, Rose Hill Center and NextStep Solutions, Inc. have partnered to develop a personalized automated record of treatment and services called *NextStep*[1] As originally designed, *NextStep* allows for client-centered tracking of each individual's treatment goals, objectives, interventions and progress.

A three-year grant from the Flinn Foundation supported a comprehensive study aimed at increasing treatment providers' ability to compare and contrast data across clients in a format that could be easily used to confirm the effectiveness of a program or, conversely, show where improvements are needed. The Flinn Foundation grant also allowed for the enhancement of *NextStep* to include the tracking and exchange of information about medication regimens. Integrating information about medication and psycho-social treatment into the same retrievable medical record, coupled with the increased ability of providers to easily compare and contrast data, *NextStep* could transform the ability of all behavioral healthcare organizations to evaluate the effectiveness of their treatments and, thus, adjust their programs accordingly.

[1] At the time the original grant application was submitted to the Flinn Foundation, this system was named ChartPARTS.

Purpose of this Grant

The grant from the Flinn Foundation to Rose Hill Center has nine major objectives:

1. Incorporate a medication module into *NextStep*
2. Implement *NextStep* at an organization working with a similarly diagnosed population
3. Obtain support from researchers to work with the team
4. Develop and evaluate metrics for measuring the effectiveness of different drug regimens with respect to a patient's progress in responding to specific interventions and, in turn, treatment goals and objectives
5. Collate and aggregate the data from Rose Hill and the other participating organization
6. Automate the process for obtaining information necessary to effectively evaluate and improve a program and drug regimen for a schizophrenic patients and for an institution at large using *NextStep*
7. Determine the effectiveness of the metrics and software
8. Process the information using statistical and pattern intelligence methods in order to extract best practice for treatment and drug regimen combinations for treating schizophrenia
9. Publish the results in a professional journal

Table 1 on the following page provides the details about each of these nine objectives.

Organization of this Report

This report describes how Rose Hill Center met the objectives of this grant. Chapter Two summarizes the work related to incorporating the medication module into *NextStep* (Objective #1). Chapter Three describes how *NextStep* was implemented at a community-based treatment provider, the research team and the development of metrics for measuring effectiveness of different drug regimens (Objectives #2, #3 and #4). Chapter Four describes the resulting automated data reports that evolved from the work of the research team, using data collated from both organizations (Objectives #5 and #6). Chapter Five describes progress made to date in determining the effectiveness of the metrics and software, statistical analyses and publication of the results (Objectives #7, #8 and #9). Chapter Six draws conclusions about the value of the resulting deliverables and what should be done in the future to bring this work to its full fruition.

Table 1
Scope of the Project

- Enhance *NextStep* to incorporate medications
  a. Create a system in which the doctors' medicinal recommendations migrate to the treatment plan
  b. Build into the system the ability for prescriptions to be forwarded directly to the pharmacy
  c. Create a training or information module that informs staff about the anticipated effect of the prescribed medications
  d. Add a mechanism which will automatically highlight the staff's charting to medication so it can be readily reviewed by the doctors

- Implement *NextStep* at an organization working with a similarly diagnosed population
  a. Develop strict standards for the development and delivery of specific information
  b. Determine if the entire system should be given to an organization or those parts necessary to collect data
  c. Determine who will be responsible for the collection and the use of the data
  d. Determine how other organizations will be trained in the use of the system
  e. Select an organization to participate in dually automating their treatment plan and records and participating in this research program

- Obtain support from researchers to work with our team.

- Develop/Evaluate metrics for measuring the effectiveness of different drug regimens with respect to a patient's progress in responding to specific interventions and, in turn, treatment goals and objectives
  a. Connect the drug regimens to specific goals, objectives, and interventions within the software
  b. Develop a numerical metric that will be used to measure the effectiveness of a particular drug regimen so that it is individualized to the patient
  c. Track specific medications by giving each a code that is recognized by the system and can be interfaced with other systems

- Collate and aggregate the data from Rose Hill and the other participating organizations

- Automate the process for obtaining information necessary to effectively evaluate and improve a program and drug regimen for a schizophrenic patient and for an institution at large using *NextStep*
  a. Match the drug regimen to the program goals established for the patient.
  b. Build the tools used to measure progress into the system. (The evaluator should not be able to move in the software past the date the evaluation is to be completed.)

- Determine the effectiveness of the developed metrics and software

- Process the information using statistical and pattern intelligence methods in order to extract best practice for treatment and drug regimen combinations for treating schizophrenia

- Publish the results in a professional journal

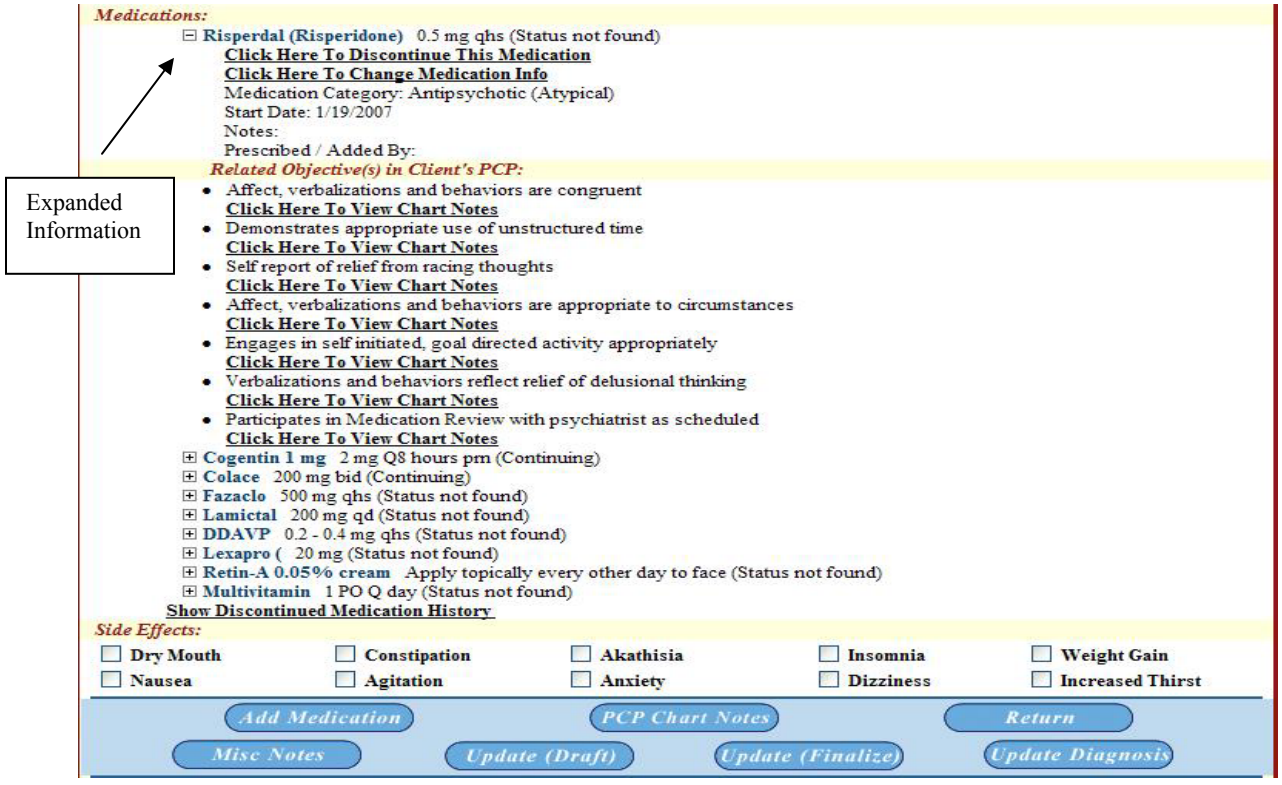
Chapter Two: Incorporating Medications into *NextStep*

Objective 1: Enhance NextStep to incorporate medications

a. *Create a system in which the doctors' medicinal recommendations migrate to the treatment plan*
b. *Build into the system the ability for prescriptions to be forwarded directly to the pharmacy*
c. *Create a training or information module that informs staff about the anticipated effect of the prescribed medications*
d. *Add a mechanism which will automatically highlight the staff's charting to medication so it can be readily reviewed by the doctors*

Through this grant, *NextStep* was enhanced to incorporate medications. Figure 1 shows the main page of the medication module that NextStep Solutions built into *NextStep*. For each patient, the module allows the psychiatrist to add medications and dosages, indicate side effects and view the objectives that the clinical staff have entered into the client's personalized care plan (PCP). The information can be updated at any time. If the physician enters a treatment objective along with the prescribed medication, this objective will migrate into the PCP and can be evaluated numerically using the progress indicators built into the software.

Figure 1: Home page for medication module of *NextStep*



The medication regimen and treatment objectives that the psychiatrist enters can be easily viewed by the case manager and any other staff involved in treatment planning.

NextStep Solutions developed a training module for teaching psychiatrists how to use the medication module, including how to access relevant information within *NextStep*. The training module is included in the Appendix. However, the training module was developed toward the end of the grant period in conjunction with Rose Hill Center's pilot grant from the Michigan Mental Health Evidence Based Practice initiative. The psychiatrists involved in the present study were trained in person by NextStep Solutions staff.

NextStep Solutions built into *NextStep* the ability to email, fax, or send via HL7 message format and to print prescriptions. While this feature was tested against format, it has not yet been implemented with a pharmacy, hospital or freestanding doctor's office.

Chapter Three: Developing Metrics for Measuring Treatment Effectiveness

Objective 2: Implement NextStep at an organization working with a similarly diagnosed population

a. *Develop strict standards for the development and delivery of specific information*
b. *Determine if the entire system should be given to an organization or only those parts necessary to collect data*
c. *Determine who will be responsible for the collection and the use of the data*
d. *Determine how other organizations will be trained in the use of the system*
e. *Select an organization to participate in dually automating their treatment plan and records and participating in this research program*

Objective 3: Obtain support from researchers to work with our team.

Objective 4: Develop/Evaluate metrics for measuring the effectiveness of different drug regimens with respect to a patient's progress in responding to specific interventions and, in turn, to treatment goals and objectives

a. *Connect the drug regimens to specific goals, objectives, and interventions within the software*
b. *Develop a numerical metric that will be used to measure the effectiveness of a particular drug regimen so that it is individualized to the patient*
c. *Track specific medications by giving each a code that is recognized by the system and can be interfaced with other systems*

The project team met all three of these objectives.

Development of the Research Team

The initial team for this project was Rose Hill Center and NextStep Solutions. Rose Hill Center is a non profit psychiatric residential rehabilitation and treatment program, located in Holly Michigan. Rose Hill Center treats adults with chronic and persistent mental illness. The program offers a step by step process in which the multidisciplinary team directs a comprehensive schedule of innovative programs focused on helping its clients achieve and maintain psychiatric stability, meaningful daily activity and independent functioning.

NextStep Solutions is a technology, engineering and e-solutions company located in Rochester, Michigan, that provides technology planning, implementation, training and support for quality improvement. NextStep Solutions offers services including IT support, clinical records and claims processing software, and research and development. NextStep Solutions team members

and Rose Hill have been working on the development of *NextStep* since 2001. Rose Hill Center began full implementation of *NextStep* in 2002, and began collecting data for this study in 2003.

In January of 2004, Dr. Melanie Hwalek, from SPEC Associates, joined the research team. SPEC Associates is a research and evaluation company located in downtown Detroit. Since 1980, SPEC Associates has been conducting program evaluations and research as well as providing technical assistance and training to non-profits, foundations and government agencies. Dr. Hwalek was asked to provide research support for this project by facilitating the development and evaluation of metrics for measuring treatment effectiveness and by guiding the design of an automated process for reporting on treatment outcomes.

In March of 2004, Northeast Guidance Center joined the research team, agreeing to implement *NextStep* for its Assertive Community Treatment (ACT) team clients. Northeast Guidance Center is a community-based multi-service mental health treatment provider for at-risk children and their families, and for adults in need of behavioral health services. The ACT program of Northeast Guidance Center is a set of intensive clinical, medical and psychosocial services provided by a mobile multi-disciplinary treatment team. The team also provides basic and complex services and supports essential to maintaining the client's ability to function in a community setting. The ACT program operates out of the Chalmers location, one of Northeast Guidance Center's four sites, all located on the east side of Detroit.

At the time Northeast Guidance Center joined the research team for this project, the organization had been using an electronic clinical record for about eight years. However, the existing system was not outcomes based. Therefore, the agency was interested in exploring the added value of *NextStep* in providing useful information about treatment effectiveness.

Because Northeast Guidance Center already had an electronic clinical record which was used for all clients, it was important that NextStep Solutions be able to import as much data as possible from the existing electronic records into *NextStep* to reduce the need for case managers and physicians to enter client information twice, once into the existing electronic clinical record and then again into *NextStep*. This proved to be a greater challenge than initially believed. According

to Northeast Guidance Center staff, the challenges of capturing encounter data for an outpatient program are different than those of residential programs where services measured as encounters are "bundled." It was also challenging to use two systems at Northeast Guidance Center since *NextStep* was only used for the ACT team. With ACT consumers also participating in other programs, it was necessary to keep a double record which was time consuming and added work for Northeast Guidance Center staff.

Although it was used only for ACT clients, the entire *NextStep* system was installed at Northeast Guidance Center. The ACT case managers were made responsible for the collection and entry of data into *NextStep*. The Northeast Guidance Center Director of Quality Improvement, Program Director and ACT Program Coordinator were the official representatives of Northeast Guidance Center on the research team.

NextStep Solutions worked with designated staff at Northeast Guidance Center to create definitions for goals, objectives and interventions, and to enter client information into *NextStep*. Because many ACT clients were already being served prior to this project, case record information on existing clients was imported into the *NextStep* database. In June of 2005, the system was fully operational at Northeast Guidance Center with information about existing clients imported into the system, and data on new clients now being added directly into *NextStep*.

Seven-Step Process of Developing Metrics and Reports

Once Northeast Guidance Center joined the research team and before *NextStep* was fully operational there, the research team embarked on a seven-step process for developing, evaluating and reporting metrics for measuring treatment effectiveness:

1. Create a theoretical model linking interventions to outcome goals and objectives
2. Identify which components of the theoretical model are important to measure
3. Create indicators for each component of the model being measured
4. Develop a measurement framework specifying the outcome goals, indicators of treatment effectiveness, data sources and data collection/analysis methods
5. Build user-friendly reports about treatment progress

6. Pilot test and revise the system

7. Train staff on the interpretation and use of treatment progress reports

The following sections describe each of these seven steps in detail.

1) Create a theoretical model linking interventions to outcome goals and objectives

The effectiveness of different drug regimens can only be assessed within the holistic context of the client's entire treatment plan. Therefore, when the research team set out to define how the effectiveness of drug regimens could be assessed, it was decided that the theoretical model relating drug regimens to treatment goals and objectives had to incorporate a comprehensive array of behavioral health interventions and expected outcomes. One advantage of the *NextStep* personalized automated record of treatment services is its ability to correlate any information about patient treatment characteristics with any and all data about patient treatment progress.

In March of 2004, the research team began a series of meetings to create the theoretical model (theory of change) that would define:

(a) what services are considered to be behavioral health interventions

(b) what resources are needed to provide these services

(c) what indicators should be used to measure adequacy of service delivery (performance)

(d) what outcomes should be expected from adults who receive behavioral health interventions

(e) what factors are likely to influence whether outcomes are achieved

Figure 2 on the following two pages presents the final *Evidence-Based Practice Model for Behavioral Health Interventions and Quality of Life Outcomes*. While the figure title uses the term "evidence-based," the model, itself, did not link to an existing evidence base when it was developed. Rather, the title is meant to convey that the model could be used as an organizing framework to examine existing and future evidence about the relationship between behavioral health interventions and outcomes for this population.

As Figure 2 shows, the research team developed a comprehensive model of behavioral health interventions that is likely to apply to most treatment modalities. The fact that the model "fits" the services and expected outcomes of both a residential (Rose Hill Center) and community-based (Northeast Guidance Center) treatment provider means that it is likely to apply to most behavioral health interventions aimed at chronically and persistently mentally ill adults.

Figure 2: Evidence-Based Practice Model for Behavioral Health Interventions and Quality of Life Outcomes
Part I: Initial, intermediate and longer-term outcomes

(draft of 1-10-07)

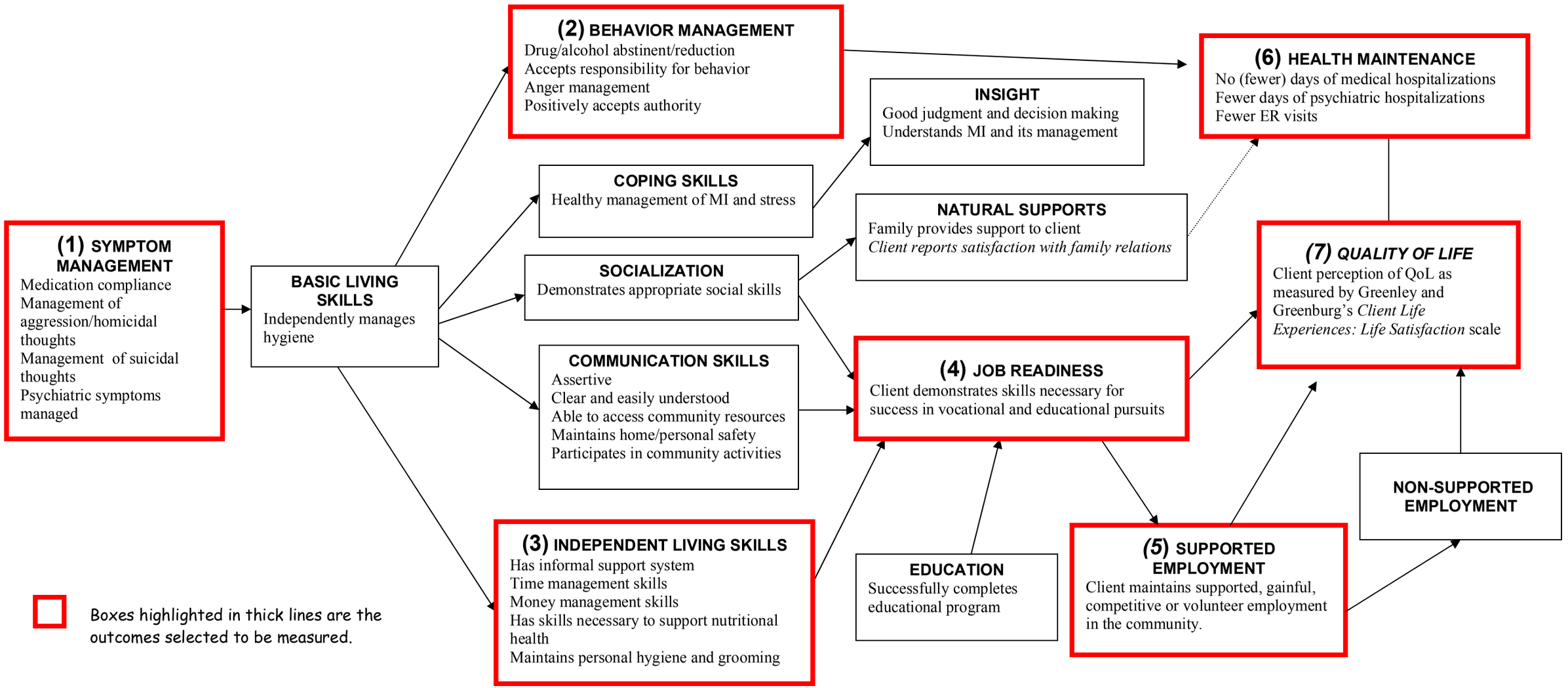


Figure 2 (continued)
Evidence-Based Practice Model for Behavioral Health Interventions and Quality of Life Outcomes

(draft of 1-10-07)

INPUTS

Intervention staff

Medication

Funding

Facilities

Curriculum
Motivational enhancement
Hazelton series

SERVICES

Psycho-pharmacological
- Medication
- Medication management

Individual intervention
- Reality orientation
- Redirection
- Reassurance
- Behavior management
- Safety/security
- Psycho education
- Clinical case management

Case management traditional

Group intervention
- Therapy
- Stage/support group
- Club house

Type of Service
- ACT team
- Residential
- Transitional living
- Substance abuse treatment

Work training program

Skill building

Socialization
- Community activities (off campus)
- Sheltered activities (on campus)

Academic support

Family/support system

Physical health activities

INFLUENCING FACTORS

CLIENT CHARACTERISTICS
1. Psychiatric diagnoses (schizophrenic, schizo-affective, affective)
2. Chronic, persistent medical diagnoses (diabetes, hypertension, obesity)
3. AXIS II (Learning disability, mental retardation, DD)
4. AXIS II (Cluster B. Personality Disorder)
5. Presence of substance abuse
6. AXIS IV Life Supports (financial resources, transportation, insurance)
7. Age of client

CHARACTERISTICS OF INTERVENTION
1. Type of medication (typical vs. atypical)
2. Poli-psychopharmacology vs. Uni-psychopharmacology
3. Client placement (residential, supervised group setting, family setting, living alone)
4. Consistency of medication over time

PERFORMANCE INDICATORS

Number of days between admission and development of person centered plan (Medicaid = 30 days max)

(For other patients) number of days between request for service and onset of services (Medicaid = 14 days max)

2) Identify which components of the theoretical model are important to measure

Once the theoretical model was developed, the research team took on the task of selecting which components of the model were important to measure. Emphasis was placed on measuring treatment outcomes and factors that might influence effectiveness in achieving outcomes. The selection process was guided by three criteria:

(1) Each selected outcome was core to the mission of both Rose Hill Center and Northeast Guidance Center.

(2) Information about each selected outcome would be of interest to major stakeholders in behavioral health intervention in addition to the members of the research team. This included other treatment providers, the Flinn Foundation, other funders and the Michigan Department of Community Health.

(3) Rose Hill Center and Northeast Guidance Center could use information about each selected outcome both to document treatment plans and their effectiveness, and to compare and contrast data across clients in order to develop best practices for treatment.

In Figure 2, the boxes highlighted in thick lines are the seven outcomes that the research team selected as important to measure. The research team believed that when the behavioral health interventions are optimal, clients will have:

1. Symptom management
2. Behavior management
3. Independent living skills
4. Job readiness
5. Supported employment
6. Health maintenance
7. Quality of life

It is important to note that the primary outcome in this model is symptom management. As the model depicts, only if clients achieve symptom management can they be expected to achieve

other psychosocial outcomes such as behavior management, independent living skills, job readiness, employment, health maintenance and improved quality of life. As the research team discussed, medicinal recommendations of the psychiatrist are necessary but not sufficient to achieve symptom management. Unless clients comply with the medicinal recommendations they are unlikely to achieve symptom management.

Compliance with medicinal recommendations requires behavioral health interventions and is mediated by certain characteristics of the client. Therefore, in addition to identifying expected outcomes, the research team identified characteristics of both the person and the intervention that were likely to influence client outcomes. The theoretical model displayed in Figure 2 shows the influencing factors: seven characteristics of patients and four characteristics of interventions that the research team believed would influence the extent to which outcomes are achieved.

Characteristics of clients likely to influence how well they achieve outcomes are:

1. Psychiatric diagnoses (schizophrenic, schizo-affective, affective)
2. Chronic, persistent medical diagnoses (diabetes, hypertension, obesity)
3. AXIS II (Learning disability, mental retardation, developmental disability)
4. AXIS II (Cluster B. Personality Disorder)
5. Presence of substance abuse
6. AXIS IV Life Problems (lack of financial resources, transportation, insurance)
7. Age of client

Characteristics of the intervention likely to influence how well clients achieve outcomes are:

1. Type of medication (typical vs. atypical)
2. Poli-psychopharmacology vs. Uni-psychopharmacology
3. Client placement (residential, supervised group setting, family setting, living alone)
4. Consistency of medication over time

While there may be many other factors that influence client outcomes, the research team believed that measuring these 11 characteristics in relation to client outcomes could provide

useful information for understanding and modifying medication regimens and behavioral interventions to that they would be more effective.

3) Create indicators for each component of the model being measured

Once the outcomes and influencing factors were selected, the research team undertook the complex task of creating ways within *NextStep* to measure each of these components of the theoretical model.

Indicators of expected outcomes

Each goal statement within *NextStep* could be an indicator for measuring an expected outcome. An important element in creating outcome indicators was that they aligned with the goal statements that both Rose Hill Center and Northeast Guidance Center created in their customization of *NextStep*. In order to collate and aggregate data to test the model, the goal statements (i.e. indicators) within Rose Hill and Northeast Guidance Center's *NextStep* had to be identical. Otherwise, data could not accurately be combined and analyzed across both agencies.

Making goal statements match required considerable discussion of the research team to assure that the meaning of each selected goal statement was consistent between the two organizations. In some cases, Rose Hill Center and/or Northeast Guidance Center had to add or modify a goal statement so that data on the selected indicator could be combined across treatment providers.

What resulted from these discussions was a core set of 19 indicators measuring the seven selected outcomes. Table 1 on the following page lists the 19 indicators arranged according to the seven outcomes that they measure. Fifteen of these indicators are goal statements incorporated into *NextStep* at both Rose Hill Center and Northeast Guidance Center. The remaining four indicators were for the longer term outcomes of health maintenance and improved quality of life which are not directly related to specific treatment goals. A special research screen was created in *NextStep* for entering data on the four indicators of these outcomes.

The three health maintenance indicators require the collection of data from either client perceptions or from payor databases. These are:

a. days of medical hospitalization
b. days of psychiatric hospitalization
c. number of emergency room visits

Table 1
Relationship between Expected Outcome and Goal Statements as Written In *NextStep*

Outcome	Goal/Indicator	Goal/Indicator Statement
SYMPTOM MANAGEMENT	Medication Compliance	The client will demonstrate Medication Compliance
	Aggression / Homicide	The client will evidence absence of homicidal or aggressive thoughts and/or behaviors toward others
	Suicide	The client will evidence absence of suicidal and/or self harming thoughts and/or behaviors
	Psychiatric Symptoms	The client will experience management of psychiatric symptoms
BEHAVIOR MANAGEMENT	Drug / alcohol	The client will reduce and/or abstain from the use of recreational drugs and alcohol
	Responsibility for Behavior	The client will assume responsibility for his/her own behaviors
	Anger Management	The client will manage and control anger effectively
	Authority	The client will work with authority in a positive and accepting manner
INDEPENDENT LIVING SKILLS	Informal Supports	The client will build an informal circle of support, to compliment formal service delivery
	Time Management	The client will demonstrate good time management skills
	Nutritional Health	The client will demonstrate skills necessary to maintain nutritional health
	Independent Living	The client will demonstrate independence and self-reliance in basic activities of daily living (ADL's) including hygiene, grooming, personal care, and attire
	Money Management	The client will demonstrate reasonable money management skills
JOB READINESS	Skills for Vocational / Educational	The client will demonstrate skills necessary for success in vocational and educational pursuits
SUPPORTED EMPLOYMENT	Maintain Employment / Volunteer	The client will maintain employment or a volunteer position in the community
HEALTH MAINTENANCE	Medical Hospitalization	The client will have no or fewer days of medical hospitalizations one year after intake.
	Psychiatric Hospitalization	The client will have no or fewer days of psychiatric hospitalization one year after intake.
	ER visits	The client will have no or fewer emergency room visits one year after intake.
QUALITY OF LIFE	Quality of Life	The client will maintain a Client Experiences Questionnaire Life Satisfaction score of 4.0 or higher, or show improvement of at least 0.5 points from the last assessment.

The quality of life indicator is the client's score on the *Client Life Experiences: Life Satisfaction (CED:LS)* scale developed by Greenley and Greenberg (1994) at the Mental Health Research Center of the University of Wisconsin-Madison. The 24-item questionnaire (included in the appendix of this report) assesses seven domains of life satisfaction:

(1) Living situation
(2) Finances
(3) Leisure
(4) Family relations
(5) Social Relations
(6) Health
(7) Access to Health Care

The *CES:LS* was selected by the research team after researching several standardized quality of life assessments for chronically and persistently mentally ill adults. The *CES:LS* had been validated with similar client populations and could be either self-administered or used by clinical staff to interview clients. The average rating (on a scale ranging from 1 to 7) of each client over the 24 items was used as the indicator for the Quality of Life outcome.

Indicators of influencing factor

All of the indicators for the selected patient and intervention characteristics (i.e. influencing factors) were measured from data collected through *NextStep*. Table 2 shows these patient characteristics, their definitions for this study, and their location within *NextStep*. Table 3 shows these intervention characteristics, their definitions for this study, and their location within *NextStep*.

Table 2
Patient Characteristics as
Factors Influencing Treatment Effectiveness

Influencing Factor	Definition	Data Source
P1. Psychiatric diagnosis	Whether client is diagnosed schizophrenia, affective disorder, schizo-affective or some other disorder	Most current diagnosis in *NextStep*
P2. Chronic, persistent medical diagnoses	Whether the client has a chronic AXIS III diagnosis	Most current diagnosis in *NextStep*

Table 2 Patient Characteristics as Factors Influencing Treatment Effectiveness		
Influencing Factor	**Definition**	**Data Source**
P3. AXIS II (Learning disability, mental retardation, DD)	Whether the client is diagnosed learning disability, mental retardation or DD (AXIS II)	Most current diagnosis in *NextStep*
P4. AXIS II (Cluster B. Personality Disorder)	Whether the client is diagnosed with personality disorder (AXIS II Cluster B).	Most current diagnosis in *NextStep*
P5. Presence of substance abuse	Whether client is actively using alcohol and/or recreational drugs at any time during the measurement period	*NextStep* progress notes
P6. AXIS IV Life Supports (financial resources, transportation, insurance)	Whether client has none, mild, moderate or severe psychosocial or environmental problems listed under (Axis IV)	Psychiatrist rating of mild, moderate or severe overall in *NextStep* psychiatrist report
P7. Age of client	Whether client is in particular age group at intake: 18-25, 26-39,40-49,50-64, 65+	Age at admission

Table 3 Intervention Characteristics as Factors Influencing Treatment Effectiveness		
Influencing Factor	**Definition**	**Data Source**
I1. Type of Medication (typical vs. atypical vs. both)	Whether client is on typical or atypical psychotropic medication or a combination of typical and atypical on the date goal achievement is measured	*NextStep* medication module
I2. Poli-psychopharmacology vs. Uni-psychopharmacology	Total number of psychotropic medications (from 0 to 5) that the client is prescribed on the date goal achievement is measured	*NextStep* medication module
I3. Living situation	Living situation of client for the majority of days within the outcome period: 1. a residential treatment facility 2. supervised Adult Foster Care 3. supported independent living (including ACT) alone (ie getting help with ADLs) 4. supported independent living with others (ie getting help with ADLs) 5. independent living alone (ie monitoring meds only) 6. independent living with others (ie monitoring meds only)	*NextStep* PCP
I4. Consistency of medication over time	% of days within the outcome period that the client has been on a consistent medication regimen	*NextStep* medication module

4) Develop a measurement framework specifying the outcome goals, indicators of treatment effectiveness, data sources and data collection/analysis methods

For each of the 19 outcome indicators, the research team grappled with three major issues in order to define the criteria that would be used to determine whether the goal had been achieved:

1. *Timeframe: Once a goal is set for a patient, what amount of time is reasonable to expect for the goal to be achieved?*

   The research team decided that the indicators for the initial outcome of symptom management should be achievable within 110 days of the goal being established in PCP. This timeframe aligned with the quarterly PCP updates that were expected to be entered into *NextStep* (90 days with a 20-day window for documentation). A timeframe of 200 days (two quarterly reporting periods with a 20-day window) was set for indicators of the remaining four outcomes included in the measurement plan: behavior management, independent living skills, job readiness, and supported employment. The timeframe for the outcomes of health maintenance and improved quality of life (*CES:LS*) was set at six months after discharge or one year after initial assessment, whichever happened sooner.

2. *Data source: Who determines that a goal has or has not been achieved and how is that decision made?*

   Many different clinical staff can enter multiple pieces of information about the same client into *NextStep*. The research team decided that the criterion for determining whether a treatment goal had been met would be the clinician's judgment after reviewing the PCP that was closest to the 110 or 200 day timeframe. This means that the clinician whose assessment of the client "counted" for measurement was the staff who completed the PCP closest to the designated timeframe. In most cases, this was the case manager at either Rose Hill Center or Northeast Guidance Center.

3. *Maintaining person-centeredness in setting treatment goals*

   In a client-centered treatment program, goals can only be set with the consent and/or by clients. Further, clients are in different stages of rehabilitation. Therefore, each of the 15 goal statements selected for measurement apply to only some of the Rose Hill Center and/or Northeast Guidance Center clients. It is highly unlikely that all of the 15 goal statements would apply to any one client. The metrics had to take into consideration that there would be a different number of clients who have particular goals set in their PCPs. To account for this variability, goal achievement was calculated only for clients who had the goal written into their PCP.

Table 4 on the following pages shows the final metrics that the research team created for measuring each of the 19 outcome indicators. The table shows, for each indicator, how successful goal attainment is defined, the timeframe for measurement, and how data for each indicator are expected to be collected.

Table 4
Measurement Framework for the
Nineteen Indicators of Seven Selected Outcomes

Outcome	Goal	Success Indicator	Time Frame	Data Collection Method
(1) SYMPTOM MANAGEMENT	Medication Compliance	% of clients who demonstrate Medication Compliance when this goal is set in their PCP	110 days	*NextStep* PCP Review Process
	Aggression / Homicide	% of clients who evidence absence of homicidal or aggressive thoughts and/or behaviors toward others when this goal is set in their PCP		
	Suicide	% of clients who evidence absence of suicidal and/or self harming thoughts and/or behaviors when this goal is set in their PCP		
	Psychiatric Symptoms	% of clients who experience management of psychiatric symptoms when this goal is set in their PCP		
(2) BEHAVIOR MANAGEMENT	Drug / alcohol	% of clients who reduce and/or abstain from the use of recreational drugs and alcohol when this goal is set in their PCP	200 days	*NextStep* PCP Review Process
	Responsibility for Behavior	% of clients who assume responsibility for his/her own behaviors when this goal is set in their PCP		
	Anger Management	% of clients who manage and control anger effectively when this goal is set in their PCP		
	Authority	% of clients who work with authority in a positive and accepting manner when this goal is set in their PCP		
(3) INDEPENDENT LIVING SKILLS	Informal Supports	% of clients who build an informal circle of support, to compliment formal service delivery when this goal is set in their PCP		
	Time Management	% of clients who demonstrate good time management skills when this goal is set in their PCP		
	Nutritional Health	% of clients who demonstrate skills necessary to maintain nutritional health when this goal is set in their PCP		

Table 4 Measurement Framework for the Nineteen Indicators of Seven Selected Outcomes				
Outcome	**Goal**	**Success Indicator**	**Time Frame**	**Data Collection Method**
	Independent Living	% of clients who demonstrate independence and self-reliance in basic activities of daily living (ADL's) including hygiene, grooming, personal care, and attire when this goal is set in their PCP		Self Report
	Money Management	% of clients who demonstrate reasonable money management skills when this goal is set in their PCP		
(4) JOB READINESS	Skills for Vocational / Educational	% of clients who demonstrate skills necessary for success in vocational and educational pursuits when this goal is set in their PCP		
(5) SUPPORTED EMPLOYMENT	Maintain Employment / Volunteer	% of clients who maintain employment or a volunteer position in the community when this goal is set in their PCP		
(6) HEALTH MAINTENANCE	Medical Hospitalization	% of clients who have no or fewer days of medical hospitalizations one year after intake.	Baseline measure is 6 months prior to admission; Estimates 12 months after admission date by taking the PCP reviewed closest to the 265 days from admission but not less than 330 days and not more than 400 days.	Self reports, Clinical Incident Reports, Billing information from managed care provider
	Psychiatric Hospitalization	% of clients who have no or fewer days of psychiatric hospitalization one year after intake.		
	ER visits	% of clients who have no or fewer emergency room visits one year after intake.		
(7) QUALITY OF LIFE	Quality of Life	% of clients who maintain a Client Experiences Questionnaire Life Satisfaction score of 4.0 or higher, or show improvement of at least 0.5 points from the last assessment.	Two most recent questionnaires, typically on year apart.	Staff administer questionnaire to client

5) Build user-friendly reports about treatment progress

With advice from the research team, NextStep Solutions created an automated reporting system that provided information about the number and percent of clients who had each of the 19 selected outcome indicators set in their PCP and, of these, the percent who achieved the goal within the designated timeframe. The report also shows how clients who achieved one outcome fared on the other outcomes, and on the influencing factors. The details of these reports are discussed in Chapter Four of this report.

6) Pilot test and revise the system

The first draft report on outcomes was produced in August of 2005. Between August of 2005 and December of 2006, the team discussed and revised the metrics for the influencing factors with the final format of the *Behavioral and Quality of Life Outcomes Report* produced in December of 2006.

7) Train staff on the interpretation and use of treatment progress reports

In March of 2006, Dr. Hwalek provided training to staff at Rose Hill Center and Northeast Guidance Center on reading the outcome reports. A copy of these training materials is included in the appendix. Training covered topics such as:

- Why measuring and reporting about outcomes is important
- The theoretical model for behavioral health interventions and quality of life
- How outcomes are being measured through *NextStep*
- How to read the main outcome report
- The meaning of the data in the main outcome report
- The value of the outcome report for clients

The management at Rose Hill Center and Northeast Guidance Center indicated that training was well received by staff. Many of the discussions among the training participants validated the theoretical model created by the research team. For example, when staff at Northeast Guidance Center were asked to reflect on the major improvements they expected to see from clients

because of the interventions they provide, staff listed the following outcomes all of which are contained within the theoretical model:

1. Adherence to goals outlined in treatment plans
2. Improved quality of life
3. Greater/more appropriate interaction in the community
4. Better relationship with treatment provider and/or family
5. Reduced frequency of hospitalization
6. Increased medication compliance
7. Increased self-sufficiency
8. Housing stability
9. Improved behavior
10. Employed or in educational program

Numerical Metrics for Measuring Effectiveness of Drug Regimens

When Rose Hill Center received its funding through the Michigan Mental Health Evidence Based Practice (MiMHEBP) demonstration grant, NextStep Solutions began the rigorous development of mathematical models for defining drug regimens. There are two main sides to measuring the effectiveness of drug regimens: symptom severity measured during medication reviews by the psychiatrist and a consumer's progress on goals. For the latter, some goals are directly related to medications such as medication compliance and symptom management. Medication compliance is a key factor in quantifying the value of a drug regimen. The degree to which a consumer is properly adhering to the regimen drives the ability to assess their regimen based on their outcomes. Initially, the models were developed for measuring the success of a stable drug regimen, that is, a drug regimen that is not being changed due to side effects or other consumer-specific occurrences. Through the MiMHEBP grant, the models have been extended to capture reasons why the drug regimen is changing over time and whether or not these changes follow the Michigan algorithm or not including reasons for deviating from the algorithm, when appropriate. Symptom severity is measured by the psychiatrist using a symptom severity scale. Organizations use different scales ranging from the Positive and Negative Symptom Scale (PANSS) to the one provided by the Michigan algorithms to an abbreviated scale created by the organization itself. The models developed by NextStep Solutions do not require an organization to use a particular scale by relatively indexing symptom severity to goal progress. We have also developed a methodology for measuring correlations between reduced symptom severity and

increased goal attainment both for goals directly related to the prescribed medication (i.e. relief of delusional thoughts and Olanzapine) and goals that are not directly related (i.e. could identify and utilize natural supports in an effective manner). These metrics are currently being evaluated and evolved through the MiMHEBP study.

Summary

In summary, Rose Hill Center completed Objectives #2, #3 and #4 of its Flinn Foundation grant. Rose Hill Center developed a successful working relationship with Northeast Guidance Center which implemented *NextStep* for its ACT team clients. Since NextStep was only used for the ACT team at Northeast Guidance Center, it was necessary for the staff to keep two medical records still which was time consuming. The research team was completed with the addition of Dr. Hwalek. As a team, Rose Hill Center, Northeast Guidance Center, NextStep Solutions and Dr. Hwalek developed and evaluated metrics for measuring not only the effectiveness of various drug regimens (e.g. typical vs. atypical vs. combination; uni- vs. poli-psychopharmacology), but also the characteristics of patients and their situations as they affected outcome achievement. This grant was the springboard for the development of more sophisticated metrics about medication regimens which is being developed through the Michigan Mental Health Evidence Based Practice grant.

Chapter Four: *NextStep* Treatment Effectiveness Data Reports

Objective 5: Collate and aggregate the data from Rose Hill and the other participating organizations

Objective 6: Automate the process for obtaining information necessary to effectively evaluate and improve a program and drug regimen for a schizophrenic patient and for an institution at large using NextStep

a. *Match the drug regimen to the program goals established for the patient.*
b. *Build the tools used to measure progress into the system. (The evaluator should not be able to move in the software past the date the evaluation is to be completed.)*

The research team designed and NextStep Solutions created three reports that collate, aggregate and report on treatment effectiveness:

- Behavioral and Quality of Life Outcomes Table
- Comparison of Clients who Achieved and Did Not Achieve Outcomes
- Influencing Factors for Clients Who Achieved Outcomes

This chapter will describe data contained in each of these reports and how treatment providers can use the information to determine best practices.

The *NextStep* system for generating these reports allows flexibility in selecting the subset of clients for whom the reports are produced. The report can be prepared for a particular provider, clients with certain diagnoses, and/or clients who were admitted into treatment within a specified period of time.

Behavioral and Quality of Life Outcomes Table

Table 5 shows the final results from the aggregated data of Rose Hill Center and Northeast Guidance Center on the percent of clients who achieved each outcome and how they fared on other outcomes. The report should be read from two perspectives: (1) across the first row, and (2) down each column.

Basic Data on Outcomes Achieved

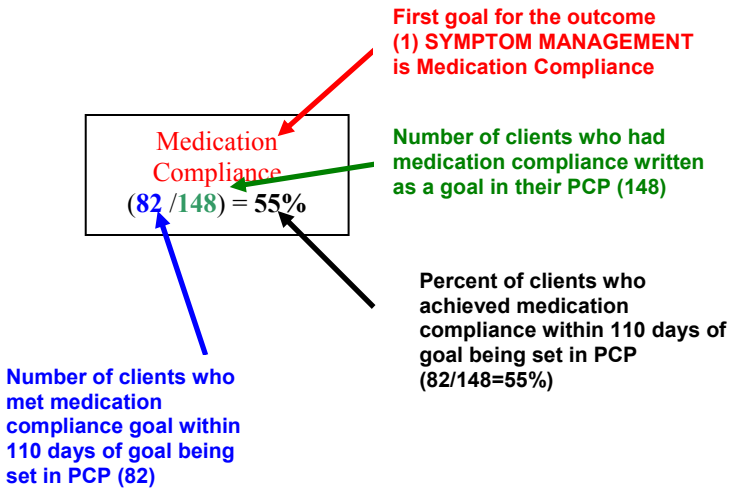
The first row of the report provides information about the number of clients for whom the goal was set and the number who achieved the goal within the specified timeframe. Figure 3 examines the first cell of this row as an illustration of how to read the report.

Table 5

Behavioral and Quality of Life Outcomes Table

	Medication Compliance	Aggression / Homicide	Suicide	Psychiatric Symptoms	Drug / alcohol	Responsibility for Behavior	Anger Management	Authority	Supports	Time Management	Nutritional Health	Independent Living	Money Management	Skills for Vocational / Educational	Maintain Employment / Volunteer	Quality of Life	Less Medical Hospitalization	Less Psych Hospitalization	Fewer ER Visits
	(82/148)=55%	(20/31)=65%	(27/43)=63%	(85/171)=50%	(43/70)=61%	(6/11)=55%	(9/20)=45%	(19/30)=63%	(1/11)=9%	(7/16)=44%	(2/5)=40%	(20/41)=49%	(6/20)=30%	(64/115)=56%	(3/5)=60%	(12/16)=75%	(6/7)=86%	(6/7)=86%	(7/7)=100%
Medication Compliance		(13/16)=81%	(19/21)=90%	(63/67)=94%	(33/36)-92%	(4/4)=100%	(6/7)=86%	(11/15)=73%	(1/1)=100%	(4/6)=67%	(1/2)=50%	(10/15)=67%	(4/4)=100%	(47/54)=87%	(1/3)=33%	(9/11)=82%	(1/4)=25%	(1/4)=25%	(1/5)=20%
Aggression / Homicide	(13/14)=93%		(6/8)=75%	(13/13)=100%	(9/11)=82%	(1/1)=100%	(3/3)=100%	(4/4)=100%	(0/0)=0%	(1/2)=50%	(0/0)=0%	(2/3)=67%	(0/0)=0%	(11/11)=100%	(1/1)=100%	(4/4)=100%	(0/0)=0%	(0/0)=0%	(0/0)=0%
Suicide	(18/23)=78%	(5/7)=71%		(22/25)=88%	(9/9)=100%	(1/1)=100%	(1/2)=50%	(2/2)=100%	(0/0)=0%	(1/1)=100%	%	(3/4)=75%	(1/2)=50%	(12/14)=86%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%
Psychiatric Symptoms	(64/78)=82%	(14/19)=74%	(23/27)=85%		(34/43)=79%	(5/6)=83%	(7/9)=78%	(14/19)=74%	(0/1)=0%	(4/6)=67%	(1/2)=50%	(13/19)=68%	(5/6)=83%	(51/64)=80%	(1/3)=33%	(6/9)=67%	(1/6)=17%)	(1/6)=17%)	(1/7)=14%
Drug / alcohol	(33/37)=89%	(9/11)=82%	(9/12)=75%	(34/40)=85%		(4/4)=100%	(6/7)-86%	(10/12)=83%	(0/0)=0%	(2/2)=100%	(0/1)=0%	(5/7)=71%	(3/3)=100%	(28/29)=97%	(1/1)=100%	(5/6)=83%	(0/0)=0%	(0/0)=0%	(0/0)=0%
Responsibility for Behavior	(4/6)=67%	(1/1)=100%	(1/1)=100%	(5/8)=63%	(4/5)=80%		(1/2)=50%	(3/4)=75%	(0/0)=0%	(1/1)=100%	(0/0)=0%	(1/1)=100%	(0/1)=0%	(3/6)=50%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%
Anger Management	(6/9)=67%	(3/4)=75%	(1/4)=25%	(7/11)=64%	(6/9)=67%	(1/1)=100%		(6/6)=100%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(2/2)=100%	(1/1)=100%	(7/10)=70%	(1/1)=100%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%
Authority	(11/14)=79%	(4/6)=67%	(2/4)=50%	(14/19)=74%	(10/12)=83%	(3/3)=100%	(6/7)=86%		(0/0)=0%	(0/0)=0%	(0/1)=0%	(4/4)=100%	(0/0)=0%	(12/15)=80%	(0/0)=0%	(1/1)=100%	(0/0)=0%	(0/0)=0%	(0/0)=0%
Supports	(1/3)=33%	(0/1)=0%	(0/1)=0%	(0/1)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%		(0/3)=0%	(0/1)=0%	(0/3)=0%	(0/0)=0%	(0/1)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/1)=0%
Time Management	(4/4)=100%	(1/1)=100%	(1/1)=100%	(4/5)=80%	(2/2)=100%	(1/1)=100%	(0/0)=0%	(0/1)=0%	(0/0)=0%		(0/1)=0%	(3/5)=60%	(0/0)=0%	(4/5)=80%	(1/1)=100%	(1/1)=100%	(0/0)=0%	(0/0)=0%	(0/0)=0%
Nutritional Health	(1/2)=50%	(0/1)=0%	(1/1)=100%	(1/2)=50%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/1)=0%		(0/1)=0%	(0/0)=0%	(0/1)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%
Independent Living	(10/13)=77%	(2/4)=50%	(3/5)=60%	(13/16)=81%	(5/5)=100%	(1/1)=100%	(2/2)=100%	(4/5)=80%	(0/0)=0%	(3/4)=75%	(0/0)=0%		(2/2)=100%	(10/14)=71%	(0/1)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%
Money Management	(4/10)=40%	(0/1)=0%	(1/3)=33%	(5/8)=63%	(3/4)=75%	(0/0)=0%	(2/2)=100%	(0/0)=0%	(0/1)=0%	(0/1)=0%	(0/2)=0%	(2/6)=33%		(5/7)=71%	(0/0)=0%	(1/1)=100%	(0/0)=0%	(0/0)=0%	(0/0)=0%
Skills for Vocational / Educational	(47/59)=80%	(11/14)=79%	(12/18)=67%	(51/61)=84%	(28/36)=78%	(3/3)=100%	(7/8)=88%	(12/15)=80%	(0/1)=0%	(4/4)=100%	(0/1)=0%	(10/14)=71%	(5/6)=83%		(2/2)=100%	(7/9)=78%	(0/1)=0%	(0/1)=0%	(0/1)=0%
Maintain Employment / Volunteer	(1/3)=33%	(1/1)=100%	(0/0)=0%	(1/3)=33%	(1/2)=50%	(0/0)=0%	(1/1)=100%	(0/1)=0%	(0/0)=0%	(1/2)=50%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(2/3)=67%		(0/1)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%
Quality of Life	(9/12)=75%	(4/5)=80%	(0/1)=0%	(6/9)=67%	(5/6)=83%	(0/0)=0%	(0/1)=0%	(1/3)=50%	(0/0)=0%	(1/1)=100%	(0/0)=0%	(0/1)=0%	(1/2)=50%	(7/10)=70%	(0/0)=0%		(0/0)=0%	(0/0)=0%	(0/0)=0%
Less Medical Hospitalization	(1/1)=100%	(0/0)=0%	(0/0)=0%	(1/1)=100%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%		(0/0)=0%	(0/0)=0%
Less Psych Hospitalization	(1/1)=100%	(0/0)=0%	(0/0)=0%	(1/1)=100%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%		(0/0)=0%
Fewer ER Visits	(1/1)=100%	(0/0)=0%	(0/0)=0%	(1/1)=100%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	(0/0)=0%	

Figure 3: Explanation of components of first row of cells in Behavioral and Quality of Life Outcomes Table



As Figure 3 shows, there were a total of 148 clients who had medication compliance set as a treatment goal for at least 110 days. For 82 of these clients, the PCP closest to 110 days indicated that the treatment goal was met. This means that 55% of these clients (82/148) achieved medication compliance within 110 days of the goal being set in their PCPs.

When the same calculations were performed for the remaining 18 outcome indicators, as shown in the first row of Table 5, results reveal that:

20 of 31 (65%)	evidenced absence of homicidal or aggressive thoughts and/or behaviors toward others
27 of 43 (63%)	evidenced absence of suicidal and/or self-harming thoughts and/or behaviors
85 of 171 (50%)	experienced management of psychiatric symptoms
43 of 70 (61%)	reduced and/or abstained from the use of recreational drugs and alcohol
6 of 11 (55%)	assumed responsibility for their own behaviors
9 of 20 (45%)	managed and controlled anger effectively
19 of 30 (63%)	worked with authority in a positive and accepting manner
1 of 11 (9%)	could identify and utilize natural supports in an effective manner
7 of 16 (44%)	demonstrated time management
2 of 5 (40%)	demonstrated skills necessary to maintain nutritional health

20 of 41 (49%)	demonstrated independence and self-reliance in basic activities of daily living (ADLs) including hygiene, grooming, personal care and attire
6 of 20 (30%)	demonstrated money management
64 of 115 (56%)	demonstrated skills necessary for success in vocational and educational pursuits
3 of 5 (60%)	maintained employment or a volunteer position in the community
12 of 16 (75%)	maintained or improved their quality of life
6 of 7 (86%)	had fewer days of medical hospitalization
6 of 7 (86%)	had fewer days of psychiatric hospitalization
7 of 7 (100%)	had fewer emergency room visits

These data provide clinical staff with a snapshot of how many clients had each goal set in their treatment plan and, of these, how many reached their goals within the specified timeframe. If the number of clients with a treatment goal is far fewer than expected, this could indicate a missed opportunity for improvement, i.e. that the clinicians should be reexamining whether the treatment goal should be set for more clients.

If the results show that a smaller percent of clients are achieving a particular goal than expected, this could mean that interventions are not as effective as planned, or that the particular group of clients had factors that impeded their ability to achieve the goal (e.g. substance abuse problems or homelessness). These influencing factors are examined in another of the reports described below.

Data and measurement issues may also affect these outcome results. For example, in discussing these findings the research team indicated that there are other goals within *NextStep* that are similar to the 15 goal statements used in this report. If clinical staff were selecting these other goals instead of the core goal statements, information about those clients would not appear in this report. Therefore, in order for this report to be useful, staff must agree to use the core goal statements for clients when they are appropriate.

The person-centeredness of treatment is also an issue in producing outcome reports. When the client has the option of selecting or not selecting treatment goals, it is possible that goals will be selected that fall outside the core 15 goal statements. This will reduce the number of clients on whom the outcome reports are based.

Figure 4: First column of Behavioral and Quality of Life Outcomes Table

	Medication Compliance
	(82/148)=55%
Medication Compliance	
Aggression / Homicide	(13/14)=93%
Suicide	(18/23)=78%
Psychiatric Symptoms	(64/78)=82%
Drug / alcohol	(33/37)=89%
Responsibility for Behavior	(4/6)=67%
Anger Management	(6/9)=67%
Authority	(11/14)=79%
Supports	(1/3)=33%
Time Management	(4/4)=100%
Nutritional Health	(1/2)=50%
Independent Living	(10/13)=77%
Money Management	(4/10)=40%
Skills for Vocational / Educational	(47/59)=80%
Maintain Employment / Volunteer	(1/3)=33%
Quality of Life	(9/12)=75%
Less Medical Hospitalization	(1/1)=100%
Less Psych Hospitalization	(1/1)=100%
Fewer ER Visits	(1/1)=100%

Relationship among Outcomes Achieved

Examining a single column in Table 5 provides information about clients' simultaneously achieving two different outcomes. The relationship between two outcomes is represented by the arrows in the theoretical model (i.e. Figure 2 shown above) which imply that *if* the first outcome is achieved, *then* there is the likelihood that the next outcome will also be achieved.

Figure 4 shows the cells in the first two columns of Table 5. For illustration purposes, one cell is circled. The numbers in this cell reflect clients for whom both goals of medication compliance and psychiatric symptom management were established in PCPs at least 90 days ago. The number 78 in the cell means that 78 clients *met* the goal of medication compliance *and* had psychiatric symptom management as a goal in their PCPs. Of these clients, 64 also met the goal of symptom management. In other words, 82% of clients (64/78) who achieve medication compliance also achieve psychiatric symptom management when this goal is set in their PCPs.

In general, achieving medication compliance is highly correlated with achieving other goals that are indicators of symptom management. As Figure 4 indicates, when clients achieve medication compliance:

- 93% show absence of homicidal or aggressive thoughts and/or behaviors toward others when this goal is set in their PCP

- 78% show absence of suicidal and/or self-harming thoughts and/or behaviors when this goal is set in their PCP

- 89% reduce and/or abstain from the use of recreational drugs and alcohol when this goal is set in their PCPs

For many of the outcomes in the theoretical model, there are an insufficient number of cases in the *NextStep* database as of January 9, 2007 for the percentages to be meaningful. Since *NextStep* contains these automated reports, organizations using *NextStep* will continue to collect data without formally extending the study since these information are based on standard *NextStep* functions and not 'add-on' functions that are only during the study period.

The information in the columns of Table 5 is important for program management. Depending on the characteristics of the client population, the number of cases in the denominator of each cell may signal problems with service delivery. For example, looking at Figure 4 above, it can be seen that of the 82 clients who achieved medication compliance, only three had the goal of identifying and utilizing natural supports in their PCPs. If the client population is residential and early in their treatment, it may be appropriate that very few would have a goal of identifying and utilizing natural supports. If, on the other hand, these 82 are clients living in the community, one would expect many more than three to have the goal of identifying and utilizing natural supports. In this case, having only three clients with this goal would signal the need for consulting with case management staff about addressing this goal with more clients in treatment planning.

Similarly, low achievement of outcomes can also signal the need for supervisory attention to program design or implementation. For example, as the data in Figure 4 illustrate, only 33% of

the clients who have maintaining employment as a goal in their PCP are achieving this goal. Program supervisors might take this knowledge to program staff to discuss ways to make the employment program more effective.

Noticeable in Figure 4 are the small numbers in the denominators of the cells. This may be due to several reasons. First, as reported both by Rose Hill Center and Northeast Guidance Center, many clients are severely disabled making the higher level goals such as money management or independent living unrealistic. Second, as mentioned above, client-centered planning may lead to clients selecting goals other than the 15 included in the outcome report. Third, it is possible that some of the clients who achieved immediate goals such as medication compliance or symptom management have not had longer term goals set long enough to "mature" and be included in the outcome report. That is, at the time of the report, 200 days many not have passed since setting the longer term goals. Fourth, the data on the outcome indicator may not be available. This is particularly true for the three indicators of health maintenance where baseline data on hospitalization and ER use is not available beyond self report to either Rose Hill Center or Northeast Guidance Center.

Comparison of Clients who Achieved and Did Not Achieve Outcomes

The second set of tables produced by *NextStep* is a comparison of how well clients who achieved each goal compared with clients who did not achieve each goal on the other outcome indicators. If clients who did not achieve a goal were equally successful as goal achievers on attaining other goals, this would suggest that there is no link between goals as hypothesized in the theoretical model.

Table 6 illustrates this comparison between successful and unsuccessful clients for the goal of medication compliance. In the *NextStep* software, Table 6 is repeated for all 19 goals.

As Table 6 shows, as would be expected, more clients who were successful in medication compliance achieved the other goals compared with clients who did not achieve medication compliance. For example, 93% (13 out of 14) of the clients who achieved medication compliance also achieved the goal of absence of homicidal or aggressive thoughts that was set in their PCPs.

In contrast, only 25% (3 out of 12) of the clients who did not achieve medication compliance achieved the goal of absence of homicidal or aggressive thoughts. As shown in the last column of Table 6, 68% more of the clients who achieved medication compliance had an absence of homicidal or aggressive thoughts compared with clients who did not achieve medication compliance (93% for those who achieved - 25% for those who did not achieve medication compliance).

Table 6
Comparing Achievers and Non-Achievers of Medication Compliance on Other Goals
Goal: Medication Compliance

Of those who achieved Medication Compliance		*How they did on other goals*	*Of those who did not achieve Medication Compliance*		Difference
(# achieved/# had goal)	%		(# achieved/# had goal)	%	
(13/14)	93%	absence of homicidal or aggressive thoughts	(3/12)	25%	68%
(18/23)	78%	absence of suicidal or self harming thoughts	(2/9)	22%	56%
(64/78)	82%	management of psychiatric symptoms	(4/64)	6%	76%
(33/37)	89%	reduced/abstention from drugs/alcohol	(3/22)	14%	76%
(4/6)	67%	assume responsibility for behavior	(0/0)	0%	67%
(6/9)	67%	manage and control anger effectively	(1/6)	17%	50%
(11/14)	79%	work with authority in positive manner	(4/9)	44%	34%
(1/3)	33%	can identify and use natural supports	(0/6)	0%	33%
(4/4)	100%	demonstrates time management	(2/9)	22%	78%
(1/2)	50%	demonstrates skills for nutritional health	(1/3)	33%	17%
(10/13)	77%	demonstrates independent living skills	(5/20)	25%	52%
(4/10)	40%	money management	(0/5)	0%	40%
(0/0)	NA	has skills for success in vocation/education	(7/38)	18%	NA
(0/0)	NA	maintains employment or volunteer work	(2/2)	100%	NA
(0/0)	NA	increase or maintains quality of life	(2/2)	100%	NA
(0/0)	NA	fewer days of medical hospitalization	(3/4)	75%	NA
(0/0)	NA	fewer days of psychiatric hospitalization	(3/4)	75%	NA
(0/0)	NA	fewer ER visits	(4/4)	100%	NA

The difference between clients who were successful and not successful in achieving medication compliance was even stronger for the goal of psychiatric symptom management. Seventy-six percent more of the clients who achieved medication compliance (82%) were able to manage their psychiatric symptoms than clients who did not achieve medication compliance (6%).

While Table 6 shows the relationship between medication compliance to the other goals, there are 18 other tables contained within *NextStep* which examine the differences between achievers and non-achievers for all of the other outcome indicators. Table 6 and the 18 similar tables in *NextStep* provide information that agencies can use for demonstrating to funders the importance of one goal to achieving other goals.

Influencing Factors for Clients Who Achieved Outcomes

The final set of tables compares the personal and intervention characteristics of clients who achieve each goal with the characteristics of the total population. Table 7 shows this comparison for the influencing factor of psychiatric diagnosis. The first row of data in this table shows the percent of clients who were diagnosed as schizophrenic, affective disorder, schizo-affective disorder or some other disorder. The remaining rows show the diagnoses for the clients who achieved each outcome.

Table 7			
P1. Whether client is diagnosed schizophrenia, affective disorder, or schizo-affective			
% Who Achieved Goal			
	# of clients with data available for this factor	**Percentage**	**Client Characteristic**
Characteristics in Client Population Overall	178	28%	diagnosed schizophrenic
	178	26%	diagnosed affective disorder
	178	34%	diagnosed schizo-affective disorder
	178	52%	diagnosed other disorder
The client will demonstrate medication compliance	82	28%	diagnosed schizophrenic
	82	26%	diagnosed affective disorder
	82	37%	diagnosed schizo-affective disorder

Table 7			
P1. Whether client is diagnosed schizophrenia, affective disorder, or schizo-affective			
% Who Achieved Goal			
	# of clients with data available for this factor	**Percentage**	**Client Characteristic**
	82	57%	diagnosed other disorder
The client will evidence absence of homicidal or aggressive thoughts and/or behaviors toward others	20	30%	diagnosed schizophrenic
	20	35%	diagnosed affective disorder
	20	35%	diagnosed schizo-affective disorder
	20	55%	diagnosed other disorder
The client will evidence absence of suicidal and/or self harming thoughts and/or behaviors	27	26%	diagnosed schizophrenic
	27	37%	diagnosed affective disorder
	27	30%	diagnosed schizo-affective disorder
	27	***70%***	diagnosed other disorder
The client will experience management of psychiatric symptoms	85	27%	diagnosed schizophrenic
	85	31%	diagnosed affective disorder
	85	40%	diagnosed schizo-affective disorder
	85	***67%***	diagnosed other disorder
The client will abstain from the use of drugs and alcohol	43	28%	diagnosed schizophrenic
	43	35%	diagnosed affective disorder
	43	35%	diagnosed schizo-affective disorder
	43	***67%***	diagnosed other disorder
The client will assume responsibility for his/her own behaviors	6	17%	diagnosed schizophrenic
	6	33%	diagnosed affective disorder
	6	50%	diagnosed schizo-affective disorder
	6	33%	diagnosed other disorder
The client will not allow anger to control his/her behavior	9	22%	diagnosed schizophrenic
	9	22%	diagnosed affective disorder
	9	44%	diagnosed schizo-affective disorder
	9	78%	diagnosed other disorder
The client will work with authority in a positive and accepting manner	19	21%	diagnosed schizophrenic
	19	47%	diagnosed affective disorder
	19	42%	diagnosed schizo-affective disorder
	19	79%	diagnosed other disorder
The client will build an informal circle of support, to compliment formal service delivery	1	100%	diagnosed schizophrenic
	1	0%	diagnosed affective disorder
	1	0%	diagnosed schizo-affective disorder
	1	100%	diagnosed other disorder
The client will demonstrate good time management skills	7	57%	diagnosed schizophrenic
	7	14%	diagnosed affective disorder
	7	14%	diagnosed schizo-affective disorder
	7	57%	diagnosed other disorder
The client will demonstrate skills necessary to maintain nutritional health	2	0%	diagnosed schizophrenic
	2	0%	diagnosed affective disorder
	2	100%	diagnosed schizo-affective disorder

Table 7			
P1. Whether client is diagnosed schizophrenia, affective disorder, or schizo-affective			
% Who Achieved Goal			
	# of clients with data available for this factor	**Percentage**	**Client Characteristic**
	2	50%	diagnosed other disorder
The client will attend to personal hygiene and grooming independently	20	25%	diagnosed schizophrenic
	20	15%	diagnosed affective disorder
	20	45%	diagnosed schizo-affective disorder
	20	55%	diagnosed other disorder
The client will demonstrate reasonable money management skills	6	17%	diagnosed schizophrenic
	6	17%	diagnosed affective disorder
	6	67%	diagnosed schizo-affective disorder
	6	50%	diagnosed other disorder
The client will demonstrate skills necessary for success in vocational and educational pursuits	64	30%	diagnosed schizophrenic
	64	28%	diagnosed affective disorder
	64	33%	diagnosed schizo-affective disorder
	64	61%	diagnosed other disorder
The client will maintain employment or a volunteer position in the community	3	33%	diagnosed schizophrenic
	3	33%	diagnosed affective disorder
	3	33%	diagnosed schizo-affective disorder
	3	33%	diagnosed other disorder
The client will increase or maintain quality of life	12	50%	diagnosed schizophrenic
	12	17%	diagnosed affective disorder
	12	33%	diagnosed schizo-affective disorder
	12	50%	diagnosed other disorder
The client will have fewer days of medical hospitalization	6	67%	diagnosed schizophrenic
	6	17%	diagnosed affective disorder
	6	33%	diagnosed schizo-affective disorder
	6	33%	diagnosed other disorder
The client will have fewer days of psychiatric hospitalization	6	67%	diagnosed schizophrenic
	6	17%	diagnosed affective disorder
	6	33%	diagnosed schizo-affective disorder
	6	33%	diagnosed other disorder
The client will have fewer ER visits	7	57%	diagnosed schizophrenic
	7	29%	diagnosed affective disorder
	7	29%	diagnosed schizo-affective disorder
	7	29%	diagnosed other disorder

Comparing clients who achieved each goal with the total client population provides insights regarding factors that might contribute to goal attainment. As Table 7 shows, at least 10% more of the clients who are diagnosed with a disorder other than or in addition to schizophrenia,

affective disorder or schizo-affective disorder achieve the outcomes of absence of suicidal and/or self harming thoughts and/or behaviors (70%), management of psychiatric symptoms (67%) and/or abstinence from the use of drugs and alcohol (67%) than the population as a whole (52%).

In *NextStep,* Table 7 is repeated for the remaining influencing factors:

Person Characteristics

P2. Client chronic Axis III diagnosis

P3. Client diagnosis of learning disability, mental retardation or developmental disability

P4. Client diagnosis of personality disorder (Axis II Cluster B)

P5. Client active use of alcohol and/or recreational drugs at the time of intervention

P6. Level of severity of psychosocial or environmental problems

P7. Age group of client

Intervention Characteristics

I1. Whether client is on typical or atypical or combination of psychotropic medications

I2. Total number of psychotropic medications that the client is prescribed

I3. Living situation of client at the time the outcome is being measured

I4. Percent of days during the outcome period that the client has been on a consistent medication regimen

Table 8 on the following pages shows the results from these other influencing factors tables, but only for those indicators where there were at least 30 clients in the database. For purposes of illustration, cells in Table 8 were bolded and italicized when the percents for clients who achieved the goal differed by 10% or more from the percent in the overall population. A review of these percents shows that:

- Diagnoses does not seem to be related to success in goal attainment. There are no meaningful differences among clients based on chronic Axis III diagnosis (P2), a

diagnosis of learning disability, mental retardation or developmental disability (P3), or diagnosis of personality disorder (P4).

- Clients not actively using alcohol or recreational drugs at the time of the intervention are much more likely to attain their treatment goals than clients using drugs/alcohol (P5).

- Age (P7) or the extent of environmental or psychosocial problems of the client (P6) do not appear to be related to goal attainment.

- More clients on atypical psychotropic medication are likely to achieve their treatment goals (I1).

- More clients who live in residential treatment facilities are experiencing management of psychiatric symptoms (I3 goal 4) than in the community.

- More clients who are prescribed their current medication for 50% to 99% of the goal monitoring period are abstaining from the use of alcohol and drugs (I4 goal 5) than those prescribed their medication regimen for shorter periods of time.

If these results are replicated when more data becomes available, they bring important knowledge to treatment providers. On one hand, it would be expected that clients living in residential treatment would experience management of psychiatric symptoms because their environment is controlled. On the other hand, the fact that clients on atypical medications are more likely to demonstrate medication compliance, experience management of psychiatric symptoms, abstain from using alcohol and/or drugs and demonstrate skills necessary for success in vocational and educational pursuit is evidence of the efficacy of these types of medication.

Table 8
Other Influencing Factor Charts
(listing only outcomes for which there were a minimum of 30 cases)

Achieved Goal	# of clients with data available for this factor	Results	
P2. If client has chronic AXIS III diagnosis			
Overall	178	15%	YES
	178	85%	NO
1 - The client will demonstrate medication compliance	82	22%	YES
	82	77%	NO
4 - The client will experience management of psychiatric symptoms	85	22%	YES
	85	78%	NO
5 - The client will abstain from the use of drugs and alcohol	43	26%	YES
	43	74%	NO
14 - The client will demonstrate skills necessary for success in vocational and educational pursuits	64	23%	YES
	64	77%	NO
P3. If client is diagnosed learning disability, mental retardation or DD (Axis II)			
Overall	178	3%	YES
	178	97%	NO
1 - The client will demonstrate medication compliance	82	1%	YES
	82	98%	NO
4 - The client will experience management of psychiatric symptoms	85	1%	YES
	85	99%	NO
5 - The client will abstain from the use of drugs and alcohol	43	5%	YES
	43	95%	NO
14 - The client will demonstrate skills necessary for success in vocational and educational pursuits	64	2%	YES
	64	98%	NO

Table 8
Other Influencing Factor Charts
(listing only outcomes for which there were a minimum of 30 cases)

Achieved Goal	# of clients with data available for this factor	Results	
P4. If client is diagnosed with personality disorder (Axis II Cluster B)			
Overall	178	15%	YES
	178	85%	NO
1 - The client will demonstrate medication compliance	82	20%	YES
	82	79%	NO
4 - The client will experience management of psychiatric symptoms	85	24%	YES
	85	76%	NO
5 - The client will abstain from the use of drugs and alcohol	43	21%	YES
	43	79%	NO
14 - The client will demonstrate skills necessary for success in vocational and educational pursuits	64	20%	YES
	64	80%	NO
P5. Whether client is actively using alcohol and/or recreational drugs at the time of the intervention.			
Overall	178	57%	YES
	178	43%	NO
1 - The client will demonstrate medication compliance	82	26%	YES
	82	***74%***	NO
4 - The client will experience management of psychiatric symptoms	85	28%	YES
	85	***72%***	NO
5 - The client will abstain from the use of drugs and alcohol	43	49%	YES
	43	51%	NO
14 - The client will demonstrate skills necessary for success in vocational and educational pursuits	64	42%	YES
	64	***58%***	NO

Table 8
Other Influencing Factor Charts
(listing only outcomes for which there were a minimum of 30 cases)

Achieved Goal	# of clients with data available for this factor	Results	
P6. Which of the psychosocial and environmental problems listed under Axis IV in *NextStep* that the Client has.			
	177	8%	have mild problems
	177	59%	have moderate problems
Overall	177	13%	have severe problems
	54	6%	have mild problems
1 - The client will demonstrate medication compliance	54	***78%***	have moderate problems
	54	17%	have severe problems
	63	6%	have mild problems
4 - The client will experience management of psychiatric symptoms	63	***73%***	have moderate problems
	63	21%	have severe problems
	31	7%	have mild problems
5 - The client will abstain from the use of drugs and alcohol	31	***77%***	have moderate problems
	31	17%	have severe problems
	47	2%	have mild problems
14 - The client will demonstrate skills necessary for success in vocational and educational pursuits	47	***83%***	have moderate problems
	47	15%	have severe problems
P7. Whether client is in particular age group at intake			
	162	28%	are 18 - 25 years old
	162	39%	are 26 - 39 years old
	162	20%	are 40 - 49 years old
	162	13%	are 50 - 64 years old
Overall	162	0%	are 65+ years old
	78	27%	are 18 - 25 years old
	78	33%	are 26 - 39 years old
	78	24%	are 40 - 49 years old
1 - The client will demonstrate medication compliance	78	15%	are 50 - 64 years old
	78	0%	are 65+ years old

Table 8
Other Influencing Factor Charts
(listing only outcomes for which there were a minimum of 30 cases)

Achieved Goal	# of clients with data available for this factor	Results	
4 - The client will experience management of psychiatric symptoms	84	29%	are 18 - 25 years old
	84	35%	are 26 - 39 years old
	84	23%	are 40 - 49 years old
	84	14%	are 50 - 64 years old
	84	0%	are 65+ years old
5 - The client will abstain from the use of drugs and alcohol	42	29%	are 18 - 25 years old
	42	38%	are 26 - 39 years old
	42	19%	are 40 - 49 years old
	42	14%	are 50 - 64 years old
	42	0%	are 65+ years old
14 - The client will demonstrate skills necessary for success in vocational and educational pursuits	64	33%	are 18 - 25 years old
	64	39%	are 26 - 39 years old
	64	19%	are 40 - 49 years old
	64	9%	are 50 - 64 years old
	64	0%	are 65+ years old
I1. Whether client is on typical or atypical or combination of psychotropic medications			
Overall	179	6%	on TYPICAL psychotropic medication
	179	51%	on ATYPICAL psychotropic medication
	179	12%	on combination of TYPICAL and ATYPICAL psychotropic medication
The client will demonstrate medication compliance	82	6%	on TYPICAL psychotropic medication
	82	***66%***	on ATYPICAL psychotropic medication
	82	10%	on combination of TYPICAL and ATYPICAL psychotropic medication
The client will experience management of psychiatric symptoms	86	3%	on TYPICAL psychotropic medication
	86	***65%***	on ATYPICAL psychotropic medication
	86	12%	on combination of TYPICAL and ATYPICAL psychotropic medication
	43	5%	on TYPICAL psychotropic medication
	43	***70%***	on ATYPICAL psychotropic medication

Table 8
Other Influencing Factor Charts
(listing only outcomes for which there were a minimum of 30 cases)

Achieved Goal	# of clients with data available for this factor	Results	
The client will abstain from the use of drugs and alcohol	43	9%	on combination of TYPICAL and ATYPICAL psychotropic medication
The client will demonstrate skills necessary for success in vocational and educational pursuits	64	3%	on TYPICAL psychotropic medication
	64	***70%***	on ATYPICAL psychotropic medication
	64	6%	on combination of TYPICAL and ATYPICAL psychotropic medication
I2. Total number of psychotropic medications that the client is prescribed.			
Overall	129	8%	are prescribed 1 medications
	129	19%	are prescribed 2 medications
	129	28%	are prescribed 3 medications
	129	27%	are prescribed 4 medications
	129	18%	are prescribed 5 medications
1 - The client will demonstrate medication compliance	70	10%	are prescribed 1 medications
	70	19%	are prescribed 2 medications
	70	31%	are prescribed 3 medications
	70	29%	are prescribed 4 medications
	70	10%	are prescribed 5 medications
4 - The client will experience management of psychiatric symptoms	73	10%	are prescribed 1 medications
	73	18%	are prescribed 2 medications
	73	32%	are prescribed 3 medications
	73	30%	are prescribed 4 medications
	73	11%	are prescribed 5 medications
5 - The client will abstain from the use of drugs and alcohol	38	13%	are prescribed 1 medications
	38	26%	are prescribed 2 medications
	38	26%	are prescribed 3 medications
	38	24%	are prescribed 4 medications
	38	11%	are prescribed 5 medications

Table 8
Other Influencing Factor Charts
(listing only outcomes for which there were a minimum of 30 cases)

Achieved Goal	# of clients with data available for this factor	Results	
	54	17%	are prescribed 1 medications
	54	20%	are prescribed 2 medications
	54	26%	are prescribed 3 medications
14 - The client will demonstrate skills necessary for success in vocational and educational pursuits	54	30%	are prescribed 4 medications
	54	7%	are prescribed 5 medications
I3. Living Situation at the time the outcome is being measured			
	112	72%	majority of days living in residential treatment facility
	112	4%	majority of days living in supervised Adult Foster Care
	112	0%	majority of days living in supported independent living
	112	9%	majority of days living in supported independent living with others
	112	1%	majority of days living independently alone
Overall	112	13%	majority of days living independently with others
	33	70%	majority of days living in residential treatment facility
	33	3%	majority of days living in supervised Adult Foster Care
	33	0%	majority of days living in supported independent living
	33	3%	majority of days living in supported independent living with others
1 - The client will demonstrate medication compliance	33	0%	majority of days living independently alone
	33	18%	majority of days living independently with others
	38	***84%***	majority of days living in residential treatment facility
	38	3%	majority of days living in supervised Adult Foster Care
4 - The client will experience management of psychiatric symptoms	38	0%	majority of days living in supported independent living
	38	0%	majority of days living in supported independent living with others
	38	0%	majority of days living independently alone

Table 8
Other Influencing Factor Charts
(listing only outcomes for which there were a minimum of 30 cases)

Achieved Goal	# of clients with data available for this factor	Results	
	38	5%	majority of days living independently with others

I4. % of days within outcome period (90 days, 180 days) that client has been on consistent medication regimen

Overall	103	10%	taking current med regimen for 100% of days within outcome period
	103	46%	taking current med regimen for 51%-99% of days within outcome period
	103	41%	taking current med regimen for 26%-50% of days within outcome period
	103	4%	taking current med regimen for 1%-25% of days within outcome period
1 - The client will demonstrate medication compliance	60	10%	taking current med regimen for 100% of days within outcome period
	60	52%	taking current med regimen for 51%-99% of days within outcome period
	60	37%	taking current med regimen for 26%-50% of days within outcome period
	60	2%	taking current med regimen for 1%-25% of days within outcome period
4 - The client will experience management of psychiatric symptoms	67	9%	taking current med regimen for 100% of days within outcome period
	67	55%	taking current med regimen for 51%-99% of days within outcome period
	67	36%	taking current med regimen for 26%-50% of days within outcome period
	67	0%	taking current med regimen for 1%-25% of days within outcome period
5 - The client will abstain from the use of drugs and alcohol	36	8%	taking current med regimen for 100% of days within outcome period
	36	***56%***	taking current med regimen for 51%-99% of days within outcome period
	36	***31%***	taking current med regimen for 26%-50% of days within outcome period
	36	6%	taking current med regimen for 1%-25% of days within outcome period

Chapter Five: Statistical Analyses About Best Practices and Next Steps for *Next Step*

Objective 7: Determine the effectiveness of the developed metrics and software

Objective 8: Process the information using statistical and pattern intelligence methods in order to extract best practice for treatment and drug regimen combinations for treating schizophrenia

Objective 9: Publish the results in a professional journal

Chapters Two through Four provided information on the major work completed through this grant on creating a medication module for *NextStep*, developing a theoretical framework for understanding best practices in behavioral health interventions, and creating a reporting system that combines data across providers and yields evidence about outcome achievement.

As mentioned in several places in prior chapters, the value of the reports is currently limited by the number of cases in the *NextStep* database. The small number of cases precludes the ability of the research team to use more sophisticated statistical and pattern intelligence methods to identify best practice for specific drug regimen combinations.

At the end of this research project, Northeast Guidance Center discontinued the use of *NextStep* for its ACT clients. Since the funding only covered *NextStep* for the ACT program, running two electronic medical record systems became too time-consuming for staff. For the database to be populated sufficiently for pattern analysis, other behavioral health providers must agree not only to use *NextStep* but also to use the 19 outcome indicators identified in this project and for which the *NextStep* data reports were created. Over time, as *NextStep* becomes used longer and by more providers, the database will become sufficiently populated to support more sophisticated data analyses.

Chapter Six: Conclusions and Recommendations

This research examined methods that could be used to acquire and analyze data to quantify best practices in medicine and psychosocial rehabilitation for chronically and persistently mentally ill adults. Study results indicate that a personalized automated record of treatment and services can provide the kinds of data that are needed to make treatment for adults more effective and can become a real tool for behavioral health treatment providers to understand the links between treatment and outcomes. Results from the available data thus far show differences among clients related to both personal characteristics (e.g. presence of alcohol/drug problems) and characteristics of the intervention (e.g. use of atypical medication regimen).

This grant was a springboard for the development of more sophisticated statistical modeling. The added funding from the Michigan Mental Health Evidence Based Practice grant not only allows for further development of the mathematical models for evaluating the effectiveness of drug regimens as it relates to outcome, it also provides a framework (the medication algorithms) around which to examine the data. The outcome indicators derived from this study should be the client outcomes against which the mathematical models are tested. The 19 outcome indicators listed in the *NextStep* report are much more meaningful and useful for decision-making than the generic "treatment goals met" definition of outcomes more typically used in clinical studies.

The prescription ordering feature developed through this grant has great potential for implementing electronic prescription ordering system-wide. This feature should be explored more fully in the near future. It may be that the system will work not only for mental health agencies, but also for free-standing doctors' offices as well as large institutions. Pharmacies interested in dramatically increasing the number of prescriptions it fills should be interested in joining this discussion, and possibly providing financial support for its field testing.

The PCP is the kingpin of this system. Data reported from *NextStep* on treatment outcomes to a large extent is based on clinical judgment, specifically the judgment of clinicians who completed the PCPs that were closest to the timeframe of outcome measurement. For the data reports to be valid, the inter-rater agreement of clinicians who complete PCPs must be established, constantly

monitored and maintained. Only if all clinicians rating clients on the outcome indicators use the same definitions of goal attainment can the results be meaningful. If providers want to assure high quality data accurate enough for decision-making, they should spend time with clinical staff who complete the PCPs. Do the different clinicians define goal attainment similarly? Do they make efforts to target the 15 core goal statements in clients' PCPs?

When training clinical staff, it would be valuable to share the outcome reports. If staff understand the purpose of using a common set of goal statements, for example, they may be more likely to pay attention to those indicators when establishing treatment plans. When staff see the value of producing data that can compare and contrast clients on outcomes as well as influencing factors, they may have a vested interest in assuring that the data entered into the system is accurate and complete. Unfortunately, the staff at Rose Hill Center and Northeast Guidance Center did not have access to the outcome reports when they began using *NextStep* because the outcomes, indicators and reports had not yet been developed.

Training for *NextStep* should be viewed as an on-going process and, perhaps, done only by NextStep Solutions staff. Staff turnover among mental health agencies means that there will always be a need for "basic training" in implementing *NextStep*. *NextStep* was developed in order to save time and reduce workload. Since they know the system "inside and out," NextStep Solutions staff can more easily talk about why *NextStep* works and the value of the software to staff's work than other agency staff who may be having difficulties, themselves, learning how to use the system.

Physician willingness to enter data into the medication modules is important to making the *NextStep* data reports work. When the volume of clients seen by physicians is large, they may not be willing to use the medication module within *NextStep*. While some psychiatrists see how using *NextStep* can save them time, others involved in this study were less willing to comply with its use. To provide data for producing the outcome reports, data entry staff may need to abstract prescription data from psychiatrist notes and enter it into *NextStep*. Alternatively, if automated systems for purchasing psychotropic medications can be established with treatment providers, this data may be able to be imported into the *NextStep* medication module.

Since the outcome indicators generated from this research were created by a research team that included clinicians and program supervisors as well as case managers working with ACT clients, it is likely that the *NextStep* automated reports provides information about outcomes that other agencies believe should be expected from behavioral health interventions. Thus, if other treatment providers using *NextStep* can agree to integrate the 15 core indicators into their treatment planning, eventually a large normative database and outcome reports can be produced. The type of information provided through *NextStep*, if collected statewide, could become a valuable tool for Michigan Department of Community Health to consider in its statewide quality improvement efforts. It should be noted, however, that if the outcome reports are to become valuable quality assurance mechanisms, all of the treatment providers must agree to collect data on the core set of 15 goal statements.

The Quality of Life indicator selected for this study differs from the measure currently being mandated by Michigan Department of Community Health for use with Medicaid clients receiving behavioral health interventions. However, the way that the quality of life data is included in *NextStep* allows for different instruments to be substituted. Thus, if MDCH were to use *NextStep* system-wide, it could substitute its own quality of life measure and, with only minimal modification, maintain the integrity of the outcome reports.

The small number of clients available for this study limits the confidence one can have in the results. The small numbers appear to be due to four issues. First, the client-centered approach to treatment means that clients, not clinicians, determine treatment goals. When client's goals do not align with the 15 treatment goals used to generate outcome reports, small sample sizes will result.

Second, many of the longer term goals in the theoretical model are not appropriate for the low functioning clients served by Rose Hill Center and Northeast Guidance Center. High maintenance clients are not likely to move toward the intermediate and longer term goals. For these clients, simply achieving medication compliance and symptom management are major successes. Involving more institutions in the study would resolve this issue.

Third, the population served by Northeast Guidance Center are transient. Not only does this make if difficult for ACT team members to stabilize clients, it means that many cannot be found for gathering data on such outcomes as quality of life and hospitalization.

Fourth, while data on hospitalization and emergency room use exists and is highly accurate because it is used by the medical system for reimbursements, these data were not available to the research team. Neither Rose Hill Center nor Northeast Guidance Center had access to this data which is essential to examining cost effectiveness of treatment. The medical system could chose to make this data available and it could be imported into *NextStep* so that treatment goals and influencing factors could be examined in relation to medical costs.

The next steps for the research team are: (1) to populate the database with more clients from more providers to allow for sophisticated statistical modeling and comparison of outcomes across treatment modalities, and (2) to identify the research literature for similar populations to see how the theoretical model and goal attainment measured through *NextStep* compare with the existing literature and norms for chronically and persistently mentally ill clients.

While more needs to be done on *NextStep*, this Flinn Foundation grant made a significant step toward allowing treatment providers to compare and contrast data across clients in order to develop best practices for treatment. With relatively small additional effort, *NextStep* can transform the ability of all behavioral healthcare organizations to evaluate the effectiveness of their treatments and adjust their programs accordingly. A next step for NextStep would be to create graphical depictions of the most important information found in the outcome reports to make it easy for administrators and clinicians who are not research-oriented to easily benefit from outcome based assessment.

Appendix

Client Experiences Questionnaire
Life Satisfaction

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This questionnaire is designed to help staff to get a clearer understanding of how you feel about your life at the present time and what you would like to change in your life. There are no RIGHT or WRONG answers, and all of the information will be kept confidential.

Question	Terrible (1)	Mostly Dissatisfied (2)	Equally Satisfied/ Dissatisfied (3)	Dissatisfied (4)	Mostly Satisfied (5)	Pleased (6)	Delighted (7)
1. The living arrangements where you live.							
2. The rules there.							
3. The privacy you have there.							
4. The amount of freedom you have there.							
5. The prospect of staying where you currently live for a long period of time.							
6. The amount of money you get.							
7. How comfortable and well off you are financially.							
8. How much money you have to spend for fun.							
9. The way you spend your spare time.							
10. The chance you have to enjoy pleasant or beautiful things.							
11. The amount of relaxation in your life.							

Question	Terrible (1)	Mostly Dissatisfied (2)	Equally Satisfied/ Dissatisfied (3)	Dissatisfied (4)	Mostly Satisfied (5)	Pleased (6)	Delighted (7)
12. The pleasure you get from the television or radio.							
13. Your family in general.							
14. The way you and your family act toward each other.							
15. The way things are in general between you and your family.							
16. The things you do with other people.							
17. The amount of time you spend with other people.							
18. The people you see socially.							
19. The chance you have to know people with whom you really feel comfortable.							
20. The amount of friendship in your life.							
21.Your health in general.							
22. Your physical condition.							
23. The medical care available to you if you need it.							
24. How often you see a doctor.							

Are there any other comments that you want to make?