

Contract No.: 100314
MPR Reference No.: 6175-400

MATHEMATICA
Policy Research, Inc.

**Evaluation of the
Medicaid Value Program:
Health Supports for
Consumers with Chronic
Conditions**

*Comprehensive NeuroScience
Case Study*

August 14, 2007

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COMPREHENSIVE NEUROSCIENCE'S MEDICAL RISK MANAGEMENT PROJECT

Comprehensive NeuroScience, Inc. (CNS) was incorporated in 1999 and has more than 300 employees throughout the United States. For the Medicaid Value Program (MVP), CNS' Care Management Technologies division implemented an intervention in Missouri called Medical Risk Management (MRM) that assists the health care providers of complex needs fee-for-service Medicaid clients with schizophrenia and co-occurring physical health conditions. MRM provided quarterly reports to providers on patients' use of health care services in the last 12 months. The providers included primary physicians, psychiatrists, mental health case managers, and other specialists. As a part of MRM, CNS also found medical homes (primary physicians and/or mental health case managers) for patients without them. The intervention's primary goals included improving patients' quality of life and reducing their use of unnecessary or inappropriate medical services, thereby reducing their overall medical costs to the state.

Using Missouri Medicaid medical claims data, CNS identified 3,000 eligible patients in early 2005 and randomly assigned them to two treatment groups and one control group. The two treatment groups received the same intervention, but their start dates were staggered; CNS began sending reports for the first treatment group in May 2005 and for the second in January 2006. After that date, providers for both groups received quarterly reports. By April 2007, CNS had mailed eight reports for the first treatment group and six for the second.

ORGANIZATIONAL CONTEXT

As health plans and state Medicaid agencies have become increasingly aware of the extensive use and high cost of behavioral drugs and the high utilization cost of patients with mental illness, CNS has created various programs to assist these organizations in improving the quality of patient care and managing costs. Of particular relevance, CNS created the Behavioral Pharmacy Management (BPM) program, which identifies prescribers whose prescribing of behavioral drugs may not follow industry-recognized guidelines for the treatment of mental disorders. Pharmacy claims are reviewed for inconsistencies in best practices using CNS' proprietary Quality Indicator™ algorithms. More than 400 active ingredients are reviewed. As part of BPM, CNS sends monthly reports to prescribers whose prescribing patterns do not meet expert-recognized best practices detailing their prescribing behavior based on the latest three months of drug claims data. BPM aims to decrease inappropriate psychotropic drug prescribing by also including medication Clinical Considerations™ in the reports that describe appropriate prescribing guidelines for behavioral drugs along with published references. CNS has implemented BPM in more than 25 state Medicaid agencies, including the Missouri Department of Medical Services since 2002. Both programs occurred simultaneously in Missouri; any providers that CNS identified to receive a report for both interventions received one combined mailing rather than two.

BPM and MRM differ in two primary ways: target population and report content. First, while CNS sends BPM reports to prescribers of all patients with claims for psychotropic medications, MRM is focused primarily on patients with schizophrenia. Second, BPM reports

include only information on prescription drugs, while MRM reports include information on physical and behavioral pharmacy and medical service utilization.

MRM grew out of ongoing discussions between CNS and Missouri Department of Mental Health and Division of Medical Services officials on the use and cost of services by clients with schizophrenia. CNS analysis of Missouri Medicaid medical claims data showed that the state spent \$145 million on beneficiaries with mental illness in 2004, but \$100 million of that was for 10 percent of the population. CNS also reported that it found that patients with schizophrenia have multiple chronic medical conditions and tend to use emergency rooms as their medical homes.¹ Because many of these patients do not have stable medical homes, they are obvious candidates for case management.

CNS has strong financial incentives to implement and improve the intervention. CNS plans to introduce an expanded MRM (called the Health Care Optimization Program) to other state Medicaid agencies and private health plans in the near future. External funding from a pharmaceutical sponsor (Eli Lilly) funded the MRM in Missouri for two years.² However, as an indication of the importance Missouri places on CNS products, the state will directly pay for the MRM intervention and other CNS products on an ongoing basis.

Since Missouri was MRM's pilot state, CNS had a strong incentive to work collaboratively with Missouri Medicaid officials to develop and monitor the intervention and to provide education to health care providers in the state.³ The Missouri Division of Medical Services and the Missouri Department of Mental Health (MDMH) viewed MRM as an opportunity to improve patient quality of life, limit unnecessary utilization of services, and reduce total health care costs of patients with mental illness. To encourage providers (particularly mental health case managers assigned by the state) to review MRM reports, MDMH allowed them to bill the state for targeted case management services which were previously only billable for patients in case management who were younger than 18. The MDMH medical director and Missouri pharmacy director have had hands-on roles in the project, contributing in development, provider education, and continuous quality monitoring.

PROGRAM INTERVENTION

The primary CNS staff members for this project included the MRM implementation director (a psychologist), the CNS account manager for Missouri, the CNS health liaison (an advanced practice nurse located in Missouri), and research staff located in CNS's main offices in North

¹ CNS reported that patients with schizophrenia in Missouri have, on average, medical claims for more than three other chronic medical conditions, such as diabetes, hypertension, and asthma.

² The initial funding period has always been two years and the sponsor has agreed to add a third year of funding in some cases. CNS first approached this pharmaceutical company about sponsoring the program. CNS officials describe its relationship with the sponsor as "hands off." The same sponsor has also funded BPM in a number of states for two- to three-year periods.

³ CNS staff also worked collaboratively with Missouri officials in the initial development of BPM as Missouri was the BPM pilot state.

Carolina. The implementation director oversaw MRM (including the addition of the medication adherence component), prepared the intervention for rollout to other potential clients, and conducted provider focus groups. The health liaison worked with officials from MDMH to educate providers about MRM, visited clinics to make presentations about MRM to case managers, and identified primary health care providers through review of medical claims and by contacting health care clinics (when necessary).

Patient Identification and Random Assignment

MRM targeted the health care providers of high-risk, fee-for-service Missouri Medicaid clients with schizophrenia. CNS used a predictive algorithm to identify patients with schizophrenia who were at high risk of adverse health outcomes and high utilizers of medical and pharmacy services. Using Missouri Medicaid claims data from December 2003 to May 2004, CNS applied five inclusion criteria sequentially to select 3,000 patients with schizophrenia for the intervention (Table 1). CNS first identified all patients with schizophrenia who had greater than \$15,000 in medical and pharmacy costs. Because fewer than 3,000 patients met this criterion CNS next identified patients with schizophrenia who met its next inclusion criterion (having a claim with a diagnosis of obesity), and so on until it had identified 3,000 patients after applying all five criteria. CNS chose these inclusion criteria based on a predictive model of the factors associated with high costs among patients with schizophrenia.⁴

TABLE 1

MRM INCLUSION CRITERIA FOR THE MISSOURI PILOT PROGRAM

Persons identified with diagnosis of schizophrenia who, from December 2003 to May 2004:

Had more than \$15,000 in medical and pharmacy costs, or

Had a medical claim with a diagnosis of obesity, or

Were female and younger than 35, with at least one psychiatric diagnosis other than schizophrenia, or

Had claims for fewer than 5 or greater than 15 psychotropic medications, or

Were not receiving case management through a community mental health clinic

Source: CNS Medicaid Value Program Reporting Template.

CNS originally planned to randomly assign the 3,000 patients to two treatment groups of 1,200 each and one control group of 600. The Missouri Department of Medical Services chose to intervene with only 1,000 of the first 1,200 treatment group patients, excluding patients who

⁴ See KN Simpson, EG Chumney, and AC Simpson. Predicting High Cost for Schizophrenia Patients on Medicaid. Report to Comprehensive NeuroScience, Inc. August 8, 2004. Since the inception of the intervention, CNS has refined the risk prediction algorithm used to identify patients and will employ this new algorithm for the implementation of the MRM program in the future in Missouri and other client states. In addition, to maximize the value of the MRM program to its clients, CNS plans to update the MRM population both as patients drop out of eligibility (for example, die or move into nursing homes) and on an annual basis based on the most recent claims data available. CNS is also expanding the primary medical conditions to include bipolar disorder and major depressive disorder, in addition to schizophrenia.

lived in a skilled nursing facility, had died or moved from Missouri since selection, or were part of a waiver program for those with mental retardation or otherwise developmentally disabled. (The state made the same decision for the second treatment group.) Before mailing reports for the second treatment group, CNS inadvertently placed the 200 patients from the first group for whom the Missouri Department of Medical Services chose not use back into the pool of patients available for random assignment. As a consequence, some patients were randomly assigned twice, making the sizes of the two treatment groups and the control group different (1,200; 1,071; and 729) from originally planned (1,200; 1,200; and 600); see Table 2.⁵ However, despite this, MRM is the only MVP intervention with a research sample size of more than 500 patients and randomly assigned treatment and control groups. About 100 patients were deemed ineligible at the time of the first mailing and dropped from the analysis.

TABLE 2
TREATMENT AND CONTROL GROUP SAMPLE SIZES

	Planned Level	Adjusted for Random Assignment Error	Actual Level After Accounting for Ineligibles
First Treatment Group	1,200	1,200	1,150
Second Treatment Group	1,200	1,071	1,011
Control Group	600	729	729

MRM Quarterly Reports

The intervention’s primary activity was a quarterly report that summarizes a patient’s use of inpatient and outpatient services, reports prescription drug claims (sorted by drug class), and notes medical diagnoses that appear in the last 12 months of available claims data.⁶ CNS sent these reports to health care providers who Missouri Medicaid confirms as primary care providers or who CNS identifies as primary care providers from claims data (by analyzing specialty type and the number of visits for each patient) or provider report. The report includes a feedback form for providers to indicate if they treat the patients listed or to provide comments on the content of the report.⁷

⁵ There are 1,200 patients included in the first treatment group (representing all patients randomly assigned to that group, regardless of whether Missouri chose them for MRM reports), 1,071 patients included in the second treatment group (patients who were only randomly assigned to the second treatment group), and 729 patients included in the control group (any patient never randomly assigned to a treatment group).

⁶ If there are fewer than 40 outpatient visits in the last 12 months of claims data, CNS includes information from visits beyond the last 12 months.

⁷ BPM reports that some providers of MRM control group members might receive only contain information on psychotropic prescription drug claims if the prescriber has deviated from CNS-developed guidelines. Thus, the BPM reports are more narrowly focused than the MRM reports.

The MRM report includes a number of elements to assist case managers and providers in coordinating patient care. For example, it identifies and lists contact information of each patient's primary health care providers (psychiatrists, physicians, and case managers) and community mental health centers or other clinics used (for patients who have primary care providers). The report also lists patients' most frequently visited physicians. In addition, the report includes care considerations based on CNS's review of medical claims and clinically accepted best-practice guidelines. For example, the report will note if the patient has claims for a lipid-lowering medication but no claims for a lipid panel blood test in the past 12 months, and indicates that such a test is normally recommended for those taking the medication. Health care providers reported that the care considerations section was the most useful aspect of the MRM reports and that they spurred care coordination between case managers and physicians.

Providing MRM Information to Providers

For MRM to be successful at improving patient quality of care, the appropriate health care providers must receive and review the reports and patients must have stable medical homes. CNS handled this process manually, having its health liaison, located in Missouri, identify treatment group patients' primary care providers (through claims data) to ensure that reports were sent to the correct providers. When there were no easily identifiable providers, the health liaison used claims data to determine which providers treat the patients most often. The liaison also established relationships with health centers in Missouri to help assign a medical home to those patients without one or to identify existing primary care providers.

CNS and MDMH also provided education on MRM to health care providers throughout Missouri. Because MRM is a provider-based intervention, it is crucial that CNS inform providers about it to maximize the likelihood they will use reports. To inform providers, the CNS health liaison and the MDMH medical director conducted five educational sessions in January 2005 for more than 300 health care providers. Though the presentations were designed for all types of providers, from physicians to mental health case managers, CNS reported that most clinics sent case manager supervisors to the sessions. (Case manager supervisors later planned to train case managers at their clinics; though, according to the health liaison, many case managers had never heard of MRM well into the second year of implementation.) The presentations focused on MRM's purpose, identifying the target population and how the intervention would function, and the important role providers play in coordinating overall health care for those with serious mental illness. CNS also made educational monographs available to providers on common chronic comorbidities of schizophrenic patients, such as diabetes or hypertension. These reports include information on treatment options to consider for patients with schizophrenia and other chronic medical conditions.

The CNS health liaison also visited clinics, as needed, throughout Missouri to answer questions about the intervention. The health liaison increased visits to community mental health centers beginning in the summer of 2006 to discuss the MRM program directly with case managers, many of whom had not heard about the program or seen reports more than a year into the intervention. The health liaison also made visits to federally qualified health centers and community mental health centers to hand deliver MRM reports to ensure that the correct providers received them and to be available to answer questions. In addition, the health liaison

made phone calls to select providers to alert them of patients who CNS identified as having high needs (such as many care consideration alerts) and to ensure that the providers were aware of the MRM reports.

In general, for the MRM intervention to be effective, providers need to use the reports in ways that translate into changes in patient utilization and costs. Whether or how this will happen in the future in Missouri or other states is unknown. The intervention has always assumed that it will (see Figure 1). The extent to which health care providers use the summaries to influence how they care for patients and affect patient care is likely one of the primary determinants of the intervention's effectiveness.

Refinements to MRM

CNS refined MRM over time to meet the needs of providers and the Missouri Department of Medical Services. For example, CNS added medication discontinuation alerts for antipsychotics in July 2006, using pharmacy claims data to determine if patients discontinue filling their medications. This component was used for about 300 patients whose medication possession ratio for a specific antipsychotic fell within 40 and 80 percent.⁸ As part of this new feature, CNS also alerted case managers, twice weekly, to inform them of medication adherence problems when patients failed to refill prescriptions within 7, 35, or 48 days of an initial antipsychotic prescription.

In addition, in August 2006, CNS held separate focus groups with case managers from two clinics and an informal question and answer session with physicians from different practices across the state, to discuss the usefulness and design of the reports. Providers' primary concern was that they did not have much time to review MRM reports given the other demands on their time. As a result of this feedback, CNS redesigned the MRM quarterly reports into an integrated health profile that provides what CNS believes to be the most timely and actionable information on the first page of the report. The report's first page includes patient diagnoses (from claims data), care considerations (as described above), and pharmacy alerts on drug-to-drug interactions.

PROCESS AND OUTCOME MEASURES

CNS collected process and outcome measures for the treatment and control groups for the intervention period and the year before the intervention period.⁹ To provide an indication of the intervention's ability to improve patients' access to care, CNS analyzed claims data to calculate the per capita number of patient contacts with case managers. Claims-based outcomes assessed included hospital admissions, emergency room (ER) use, pharmacy costs, inpatient costs, and outpatient costs. CNS also conducted focus groups with case managers and a question and

⁸ The medication possession ratio measures the percentage of the time a patient has filled a prescription over a specified period of time. The total number of days supply for fills is divided by the total number of days within the reference period to obtain a medication possession ratio between 0 and 100 percent.

⁹ The intervention period was 17 months (June 2005 to October 2006) for the first treatment group and 9 months (February 2006 to October 2006) for the second treatment group.

answer session with physicians to collect information on the usefulness of MRM reports and how providers were using them.

By providing health care providers with utilization summaries and finding medical homes for patients, CNS hoped to stabilize patients' conditions, limit ER visits and inpatient admissions, and reduce overall medical costs for patients (Figure 1). More appropriate care might also result in lower pharmacy costs. The measures CNS collected are consistent with the primary goals of the intervention, but lacked information on improvement of patient quality of life and functioning, also MRM goals.

Over the entire intervention period, there were no treatment-control differences in the outcomes measured for the first treatment group (Table 3). However, for the second treatment group, average control group outcomes were significantly smaller than those of the treatment group for three measures: inpatient admissions, inpatient costs, and ER visits. With such a short follow-up period for the second cohort (only nine months), such unintuitive, but significant results are possible and more likely due to chance than a program impact. Treatment group outcomes were always smaller during the intervention period than the 12-month pre-intervention period, but the same pattern existed in control group outcomes (not shown).

These findings illustrate the importance of having a valid comparison group design and highlights the caution with which promising trends in the less rigorously defined MVP interventions should be interpreted. Nearly all outcomes were lower during the intervention period compared with the baseline period for both the treatment and control groups (not shown). Without a rigorous research design, one might confuse these trends as impacts when, in reality, there were no differences among the two randomly assigned groups.

The lack of treatment-control differences in outcomes may be due to a number of factors. First, control group members' prescribers were eligible over the intervention period to also receive BPM letters. So, while these providers received no information on the MRM, it is possible that any prescribing changes they made due to BPM letters influenced the same outcomes as CNS measured for the MRM. Second, as discussed below, providers may not have been aware of MRM soon enough (or at all) for the reports to influence patient outcomes. Without an adequate amount of time to review and react to MRM reports, patient outcomes cannot be expected to change. Third, providers of intervention patients (both in the treatment and control groups) may already collect MRM-like information for their patients, making the reports primarily redundant to patient care and future outcomes. Information collected from case managers in both rounds of MPR's interviews suggest that many case managers already collect the information included in MRM reports and use it primarily as a confirmation that they have the correct information about their patients.¹⁰ The health liaison also reported that 10 to 12 percent of the treatment group (both combined) was managed in residential treatment facilities for which, according to CNS staff, the MRM reports "are not telling them anything new." This suggests that patient identification should be further refined to target those patients least likely to already be managed at a high level.

¹⁰ For example, to confirm that patients have had specific physician visits.

TABLE 3

CNS-REPORTED OUTCOME MEASURES FOR THE TREATMENT AND CONTROL GROUPS,
DURING THE INTERVENTION PERIOD

Outcome	Treatment	Control	Difference	p-value
First Treatment Group Cohort				
Inpatient admissions	0.04	0.03	0.01	.275
Inpatient costs	\$248	\$185	\$63	.136
ER visits	0.30	0.28	0.02	.459
Outpatient costs	\$1,097	\$1,114	-\$17	.762
Pharmacy costs	\$563	\$554	\$9	.731
Case management units	8.2	8.2	0.0	.988
Number of Patients	1,150	729		
Second Treatment Group Cohort				
Inpatient admissions	0.05	0.03	0.02	.024**
Inpatient costs	\$280	\$160	\$120	.001***
ER visits	0.28	0.21	0.07	.023**
Outpatient costs	\$969	\$961	\$8	.892
Pharmacy costs	\$278	\$284	-\$7	.799
Case management units	6.7	6.0	0.7	.164
Number of Patients	1,011	729		

Source: Missouri Medicaid claims data

Note: All outcomes are measured in per-member-per-month units and only include those months for which patients were enrolled in the intervention. Each case management unit represents 15 minutes of case management time billed to Medicaid by case managers. CNS began sending reports for the first treatment group in May 2005 and for the second in January 2006.

The number of treatment group members reported in this table differs from the total number randomly assigned because some patients were deemed ineligible at the time of the first mailing.

**The difference in treatment and control was significantly different from zero at the .05 level, two-tailed t-test.

***The difference in treatment and control was significantly different from zero at the .01 level, two-tailed t-test.

INTERVENTION CHALLENGES

CNS encountered implementation challenges that were likely important factors in explaining the lack of impacts on patient outcomes. Some clinics either lost or never received early MRM reports in the first mailing for the first treatment group; CNS staff reported that as many as 25 percent of mailings were misdirected. In some cases, CNS mailed reports to senior clinic staff who did not know what to do with reports; and in other cases there was miscommunication between clinic managers and providers as to who should receive the reports. To remedy the

situation, CNS began sending mailings to clinic supervisors directly rather than to more senior clinic managers. The second quarterly MRM mailing was also delayed three to four weeks when the state of Missouri asked CNS to not include information on HIV or substance abuse in the reports (for privacy reasons) and CNS adjusted its reports to accommodate this change.

There were also problems with the train-the-trainer strategy that Missouri and CNS used early in the intervention. It was expected that clinic supervisors who participated in large group presentations would take what they learned about the MRM program and inform case managers in their clinics about it. However, once the health liaison began making visits to community mental health centers in the summer of 2006, it became clear that this did not happen in many clinics. Specifically, case managers reported not knowing about the program or ever seeing MRM reports. In general, CNS recognized the lack of provider engagement with the intervention as an important lesson learned from the MRM pilot. Staff acknowledged that one way to improve the MRM program would be to increase the visibility of the health liaison at the individual clinic-level with more periodic education and followup in the field.

CNS also had difficulty identifying patients' primary care providers from claims data early in the intervention period. To compound this problem, about 40 percent of the treatment group did not initially have a mental health case manager. More than two years into the program, the health liaison reported that CNS had not identified a primary case manager, primary care provider, and a primary psychiatrist for all patients in the treatment group. To ensure that reports were mailed to the appropriate providers, the health liaison matched providers to patients using claims data, but staff reported that this process was resource intensive and a continual challenge to overcome.

CNS also reported that staffing turnover within its organization made coordination of MRM activities (such as reporting outcomes) challenging. Staff who began working on the MRM at its inception left the company halfway through the intervention, leaving new staff (including the MRM implementation director) to direct the intervention.

CONCLUSIONS

MRM targets an area of growing interest to state Medicaid agencies and private health plans. Because it is a provider-based intervention, whether or not MRM can have an impact on patient outcomes will hinge on the usefulness of reports to providers and providers' responsiveness to information contained in the reports. While CNS received comments from providers through feedback forms and at in-person meetings, how the providers actually used the reports was not being measured directly in this pilot project. In fact, the only process measure CNS did measure, case management contacts, suggests that receipt of MRM letters did not result in increased contacts for the treatment group compared with the control group.

Delays in the receipt of reports by some providers and the lack of information for others likely weakened the intervention. Also, the co-implementation of the BPM and MRM in Missouri—which both involve reports to providers—likely confounded MRM's impact on patient outcomes, specifically medication use. For example, because the BPM's primary focus is the prescribing of psychotropic medications and providers of control group members might

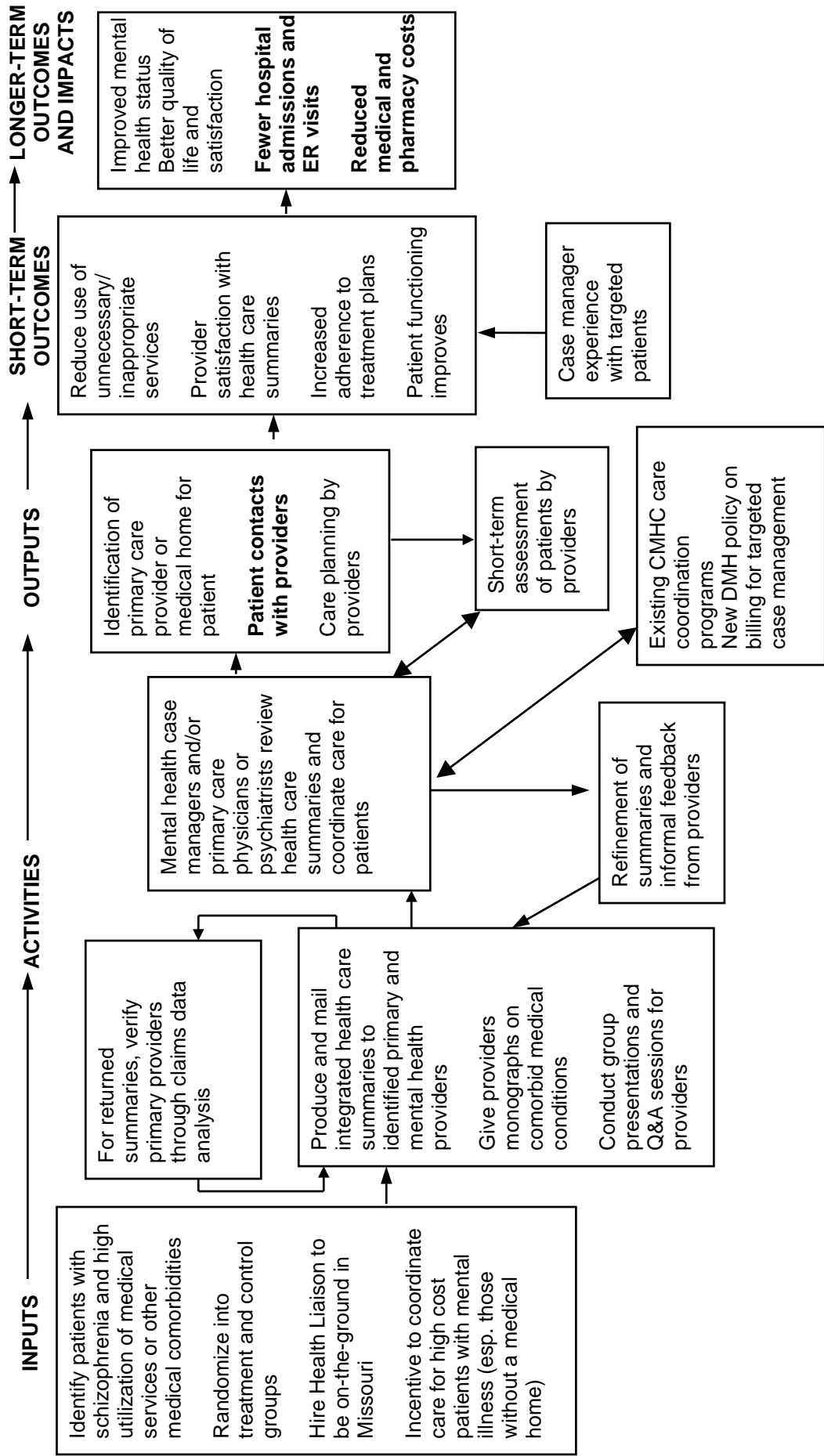
receive BPM reports, inappropriate prescription drug use could drop for both the MRM treatment and control group.

If implementation challenges are addressed and providers review MRM reports, the program may have its most detectable impact on patients' ER use and, possibly, inpatient admissions. Staff from both CNS and MDMH reported that target patients tend to use the ER as a medical home. If CNS is able to locate stable medical homes for patients and health care providers use MRM reports, ER use might decline in the treatment group compared with the control group. Over the longer term, better case management by a primary care provider might improve patient quality of life and reduce hospital admissions and overall medical costs. One of the primary challenges to this framework for the pilot program was that many treatment group patients appeared to already be managed in this way, suggesting that providers likely also managed the care of control group patients.

The MRM program is likely replicable in other states or settings (perhaps for large health plans with many unmanaged patients with schizophrenia) where claims data are accessible and accurate. Since MRM reports are generated solely from claims data, having these data available is a key prerequisite to the intervention. An important aspect of mental health delivery in Missouri that also likely plays a role in the intervention was the existence of a centralized network of community mental health clinics. In Missouri, these clinics have one central advocacy group, making it easier to receive buy-in from the clinics but not necessarily from individuals' providers. Another key program component will be the ability of CNS to inform providers of the intervention and have staff available to answer questions and provide education.

FIGURE 1

LOGIC MODEL FOR CNS'S MRM INTERVENTION



Note: **Bold** indicates reported process and outcome measures.